별첨 1 자료추출

1. 자료추출

1.1 치근단절제술

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">1</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Arx (2020)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>스위스</td></tr>
<tr><td>• 연구기관</td><td>단일기관
- Department of Oral Surgery and Stomatology, University of Bern</td></tr>
<tr><td>• 연구기간</td><td>2015.1.~2017.12.</td></tr>
<tr><td rowspan="7">연구대상</td><td>• 포함기준</td><td>근관치료
치근단 수술 후 베른대 구강악안면외과에 의뢰된 환자 중 1년 f/u 된 자
(BCRRM 역충전재 사용)</td></tr>
<tr><td>• 제외기준</td><td>- through-and through lesions
- apico-marginal defects
- root perforation</td></tr>
<tr><td>• 표본수</td><td>환자수 (N=161), 치아수 (N=188)</td></tr>
<tr><td>• 표본수집방법</td><td>연속모집</td></tr>
<tr><td>• 연령</td><td>56.0 ± 14.1 (range 25~82 yrs) (환자 수 기준)
<table><tr><th>분포</th><th>N</th><th>%</th></tr><tr><td>〈45</td><td>36</td><td>24.7</td></tr><tr><td>≥45</td><td>110</td><td>75.3</td></tr></table></td></tr>
<tr><td>• 성</td><td><table><tr><th>분포</th><th>N</th><th>%</th></tr><tr><td>남</td><td>59</td><td>40.4</td></tr><tr><td>여</td><td>87</td><td>59.6</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th>분포</th><th>N</th><th>%</th></tr><tr><td>Maxillary anteriors</td><td>42</td><td>28.8</td></tr><tr><td>Maxillary premolars</td><td>21</td><td>14.4</td></tr><tr><td>Maxillary molars</td><td>28</td><td>19.2</td></tr><tr><td>Mandibular anteriors</td><td>4</td><td>2.7</td></tr><tr><td>Mandibular premolars</td><td>15</td><td>10.3</td></tr><tr><td>Mandibular molars</td><td>36</td><td>24.7</td></tr><tr><td>Total</td><td>146</td><td>100.0</td></tr></table></td></tr>
<tr><td>• 역충전 재료</td><td>전체 BCRRM임</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Apical surgery</td></tr>
<tr><td>• 비교치료법</td><td>NA</td></tr>
</table>

<table>
<tr><td rowspan="2">추적관찰</td><td colspan="2">• Recall rate</td><td>환자기준 90.7%(146/161), 치아기준 90.4%(170/188)</td></tr>
<tr><td colspan="2">• 추적관찰기간</td><td>평균: NR, 최소: 1년, 최대: NR</td></tr>
<tr><td>결과 평가기준</td><td colspan="3">Survival rate: NR
Success rate:
- Success: complete/incomplete healing by Molven criteria and no symptom
• no clinical signs/symptoms and complete or incomplete radiographic healing
- Uncertain: no clinical signs/symptoms and uncertain radiographic healing
- Fail: uncertain/unsatisfactory healing by Molven criteria or any symptom
• no clinical signs/symptoms and unsatisfactory radiographic healing, as well as all cases presenting clinical signs/ symptoms irrespective of the radiographic healing classification
Success: complete/incomplete healing by Molven criteria and no symptom
Fail: uncertain/unsatisfactory healing by Molven criteria or any symptom</td></tr>
<tr><td>결과평가자 수</td><td colspan="3">3명</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td colspan="2">98.8%(168/170)</td></tr>
<tr><td>success rate</td><td colspan="2">Success rate
- Overall (치아수 기준)
<table><tr><th></th><th>N</th><th>%</th></tr><tr><td>Successful</td><td>160</td><td>94.1</td></tr><tr><td>Uncertain</td><td>7</td><td>4.1</td></tr><tr><td>Failed</td><td>3</td><td>1.8</td></tr><tr><td>Total</td><td>170</td><td>100.0</td></tr></table>
- Subgroup (환자 수 기준)
<table><tr><th>분포</th><th>N</th><th>success n</th><th>success %</th></tr><tr><td>연령</td><td></td><td></td><td></td></tr><tr><td>〈45</td><td>36</td><td>35</td><td>97.2</td></tr><tr><td>≥45</td><td>110</td><td>102</td><td>92.7</td></tr><tr><td>성</td><td></td><td></td><td></td></tr><tr><td>남</td><td>59</td><td>54</td><td>91.5</td></tr><tr><td>여</td><td>87</td><td>83</td><td>95.4</td></tr><tr><td>치아위치</td><td></td><td></td><td></td></tr><tr><td>Maxillary anteriors</td><td>42</td><td>40</td><td>95.2</td></tr><tr><td>Maxillary premolars</td><td>21</td><td>21</td><td>100.0</td></tr><tr><td>Maxillary molars</td><td>28</td><td>25</td><td>89.3</td></tr><tr><td>Mandibular anteriors</td><td>4</td><td>4</td><td>100.0</td></tr><tr><td>Mandibular premolars</td><td>15</td><td>13</td><td>86.7</td></tr><tr><td>Mandibular molars</td><td>36</td><td>34</td><td>94.4</td></tr></table></td></tr>
<tr><td>결론</td><td colspan="3">BCRRM은 생체에 적합한 역충전재로 1년 성공률은 높으며 기존 연구결과와도 유사함</td></tr>
<tr><td>기타</td><td colspan="3"></td></tr>
<tr><td>- 재정지원</td><td colspan="3">- 지원 없음, COI 없음
• No conflicts of interests</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">2</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Lee (2020)</td></tr>
<tr><td rowspan="3">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>한국</td></tr>
<tr><td>• 연구기관</td><td>단일기관
- 연세대학교 (Microscope Center of the Department of Conservative Dentistry at the Dental College, Yonsei University)</td></tr>
<tr><td></td><td>• 연구기간</td><td>2010.3 ~ 2017.9</td></tr>
<tr><td rowspan="6">연구대상</td><td>• 포함기준</td><td>재치료가 실패했거나 불충분한 만성치근단농양(chronic apical abscess) 또는 증상이 있는 치근 치주염(apical periodontitis) 환자</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>46/46 (환자수/치아수)</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td><table><tr><td></td><td>n</td><td>%</td></tr><tr><td>≤ 40 y</td><td>15</td><td>42.9</td></tr><tr><td>〉40 y</td><td>20</td><td>57.1</td></tr></table></td></tr>
<tr><td>• 성</td><td><table><tr><td></td><td>n</td><td>%</td></tr><tr><td>Male</td><td>12</td><td>34.3</td></tr><tr><td>Female</td><td>23</td><td>65.7</td></tr></table></td></tr>
<tr><td></td><td>• 치아 위치</td><td>상악 대구치 100%</td></tr>
<tr><td></td><td>• 역충전 재료</td><td>NR</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Endodontic Microsurgery</td></tr>
<tr><td>• 비교치료법</td><td>NA</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>76% (35/46)</td></tr>
<tr><td>• 추적관찰기간</td><td>최소 1년, 최대 3년 이상
<table><tr><th>Follow-up period</th><th>No. of cases</th></tr><tr><td>Less than 1 y (failed)</td><td>3</td></tr><tr><td>1–2 y</td><td>7</td></tr><tr><td>2–3 y</td><td>12</td></tr><tr><td>3+ y</td><td>13</td></tr></table>range: 1 – 8.1 y 평균: 3.5 y</td></tr>
<tr><td>결과 평가기준</td><td colspan="2">1차변수 survival rate
- NR
2차변수 success rate
- 임상적 방사선학적으로 판단됨 (criteria used by Molven et al)
• successful: when the teeth showed no signs and/or symptoms, no increased mobility, no increased probing depths, and a radiographic assessment of complete or incomplete healing.
• failure: Teeth that showed any of the aforementioned events or a radiographic assessment of uncertain or unsatisfactory healing were regarded as failure cases.</td></tr>
<tr><td>결과평가자 수</td><td colspan="2">2명</td></tr>
<tr><td>결과</td><td>survival rate</td><td>97.1%(34/35)</td></tr>
</table>

success rate		시점	event	Total	%
	Total	overall	32	35	91.43
	Sex				
	Male	overall	12	12	100.00
	Female	overall	20	23	86.96
	Age				
	≤ 40 y	overall	14	15	93.33
	〉40 y	overall	18	20	90.00
결론	구개 접근법을 이용한 상악 제 1 대구치의 치근단절제술은 성공적이었으며 동맥 및 신경 손상으로 인한 합병증도 적은 것으로 분석됨				
기타					
- 재정지원	공적지원 - National Research Foundation of Korea (NRF) funded by the Ministry of Education (NRF-2017R1D1A1B03033315).				

연번(Ref ID)	3	
1저자(출판연도)	Truschnegg (2020)	
연구방법	• 연구설계	전향적 환자군 연구
	• 연구국가	오스트리아
	• 연구기관	단일기관 - Division of Oral Surgery and Orthodontics, Department of Dental Medicine and Oral Health, Medical University of Graz
	• 연구기간	2004-2006
연구대상	• 포함기준	endodontically treated teeth with core and post restorations and showed either apical osteolytic lesions or only clinical symptoms of apical periodontitis 1. periapical radiologic lesion and/or clinical symptoms corresponding to apical periodontitis 2. adequate core-post-crown restoration 3. no clinically and radiologically apparent marginal leakage, and orthograde revision of the root treatment not performed because of the presence of the post and core restoration
	• 제외기준	1. attachment loss of more than 5 mm or possible apicomarginal communication and/or furcation involvement 2. root fracture 3. post perforation 4. pregnancy 5. unacceptable general health (American Society of Anesthesiologists 4-5 and/or general or local risk factors that preclude oral surgery) 6. Patient- and tooth-relatedfactors like age, sex, smoking and alcohol habits, location of the operated tooth 7. previous endodontic surgery 8. size of the pre- and postoperative lesion, and perioperative antibiotics potentially influencing the course of periapical healing were assessed in each case
	• 표본수	환자수 (N=73), 치아수 (N=87)
	• 표본수집방법	NR
	• 연령	평균: NR, 치아수 기준

분포	1.5-5 years		10-13 years	
	N	%	N	%
22-35	14	16.5	6	9.7
36-54	55	64.7	44	71.0
55-85	16	18.8	12	19.4
Total	85	100.0	62	100.0

• 성

분포	1.5-5 years		10-13 years	
	N	%	N	%
남	51	60	34	54.8
여	34	40	28	45.2

• 치아 위치

분포	1.5-5 years		10-13 years	
	N	%	N	%
Maxillary anteriors	20	23.5	13	21.0
Maxillary premolars	11	12.9	10	16.1
Maxillary molars	4	4.7	2	3.2
Mandibular anteriors	0	0.0	0	0.0
Mandibular premolars	14	16.5	12	19.4
Mandibular molars	36	42.4	25	40.3

		Total | 85 | 100.0 | 62 | 100.0
	• 역충전 재료	전체 Intermediate Restorative Material (IRM; Dentsply Caulk, Milford, DE)
중재법 및 비교치료법	• 중재법	Apical microsurgery
	• 비교치료법	NA
추적관찰	• Recall rate	1.5-5yrs: 환자기준 97.3%(71/73), 치아기준 97.7%(85/87) 10-13yrs: 환자기준 74.0%(54/73), 치아기준 71.3%(62/87)
	• 추적관찰기간	평균: NR, 최소: 1년, 최대: NR
결과 평가기준		Clinical & Radiographic assessment (Molven et al as healed or nonhealed)
결과평가자 수		4명
결과	survival rate	79.0%(49/62)
	success rate (실패원인: 방사선, 증상)	Success rate (치아 기준) - Overall & Subgroup 별

분포	1.5-5 years			10-13 years		
	N	success		N	success	
		n	%		n	%
전체	85	83	97.6	62	47	75.8
성별						
남	51	49	96.1	34	26	76.5
여	34	34	100.0	28	21	75.0
연령						
22-35	14	14	100.0	6	5	83.3
36-54	55	54	98.2	44	32	72.7
55-85	16	15	93.8	12	10	83.3
위치						
Maxillary anteriors	20	20	100.0	13	12	92.3
Maxillary premolars	11	10	90.9	10	5	50.0
Maxillary molars	4	4	100.0	2	1	50.0
Mandibular anteriors	0	-	-	0	-	-
Mandibular premolars	14	13	92.9	12	11	91.7
Mandibular molars	36	36	100.0	25	18	72.0
Smoking						
No				53	45	80.4
Yes				6	2	33.3

※ 기타 과거수술력, lesion 사이즈, 항생제 여부별 성공률 제시

결론	Core & post restorations 된 치근단절제술의 장기 성공률은 1.5-5년에 높았으며, 10-13년 이후에도 좋은 성과를 보임
기타	
- 재정지원	- 지원 없음, COI 없음

연번(Ref ID)	4	
1저자(출판연도)	Arx (2019)	
연구방법	• 연구설계	전향적 환자군 연구
	• 연구국가	스위스
	• 연구기관	단일기관 - School of Dental Medicine, University of Bern, Bern, Switzerland
	• 연구기간	(모집기간) 2001. 05. - 2007. 12.
연구대상	• 포함기준	기간동안에 치근단 절제술을 받은 환자
	• 제외기준	Cases with apicomarginal defects, tunneling lesions, or iatrogenic root perforations were excluded from the present evaluation.
	• 표본수	최초수술대상 107/107
	• 표본수집방법	consequtively (Arx(2014) 참고)
	• 연령	NR
	• 성	NR
	• 치아 위치	NR
	• 역충전 재료	MTA 100%
중재법 및 비교치료법	• 중재법	Apical surgery
	• 비교치료법	NA
추적관찰	• Recall rate	61.03% (119/195) (환자수, 치아수 동일)
	• 추적관찰기간	10년
결과 평가기준	survival	NR
	success	Healing categories 1) Healed Clinical signs or symptoms (None) and Radiographic healing (Complete or incomplete) 2) Not healed Clinical signs or symptoms (Yes) or Radiographic healing (Uncertain or unsatisfactory)

TABLE 1. Healing Categories and Definitions

	Clinical signs or symptoms		Radiographic healing
Healed	None	AND	Complete or incomplete
Not healed	Yes	OR	Uncertain or unsatisfactory

※ Radiographic healing around the operated root(s) was categorized into 4 groups according to the criteria by Rud et al and Molven et al

결과평가자 수		3 명
결과	survival rate	NR
	success rate	

	시점	event	total	%
overall	10년	88	107	82.24

※ table 6. 10년 추적관찰 시점 전체 119개 중 first-surgery인 경우만 가져옴

결론	This clinical long-term study of apical surgery using MTA as root-end filling material showed a rate of healed cases of 81.5% after 10 years. This was significantly lower than the rates after 1 and 5 years (91.6% and 91.4%).
기타	
- 재정지원	지원없음 - The authors deny any conflicts of interest related to this study.

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">5</td><td></td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Safi (2019)</td><td></td></tr>
<tr><td rowspan="4">연구방법</td><td colspan="2">• 연구설계</td><td>RCT (noninferiority RCT)</td></tr>
<tr><td colspan="2">• 연구국가</td><td>미국</td></tr>
<tr><td colspan="2">• 연구기관</td><td>단일기관
- Department of Endodontics, University of Pennsylvania Dental School</td></tr>
<tr><td colspan="2">• 연구기간</td><td>2011.7.~2014.5.</td></tr>
<tr><td rowspan="6">연구대상</td><td colspan="2">• 포함기준</td><td>지속/재발 근단치주염 환자 대상 무작위 할당
1. ≥18 yr, 연구참여 동의, ≥1 f/u CBCT evaluation after 12 months
2. Noncontributory medical history (American Society of Anesthesiologists class I, II)
3. 과거력: endodontic treatment with radiographic presence of apical periodontitis
4. A true endodontic lesion: microsurgical classification A, B, or C
5. Lesion size less than 10 mm in diameter</td></tr>
<tr><td colspan="2">• 제외기준</td><td>1. 비동의, 〈18세
2. medical history (Americal society of Anesthesiologists class Ⅲ~Ⅴ)
3. Insufficient coronal restoration
4. Nonrestorability or traumatized teeth
5. Microsurgical classification D, E, F
6. Mobility〉1
7. 비치근흡수 (방사선적 진단)
8. 재수술
9. 수직 치근 파절
10. 병소크기 ≥10mm</td></tr>
<tr><td colspan="2">• 표본수</td><td>치아수 (N=120, MTA 57, RRM 63)</td></tr>
<tr><td colspan="2">• 표본수집방법</td><td>연속모집</td></tr>
<tr><td colspan="2">• 연령</td><td>NR</td></tr>
<tr><td colspan="2">• 성</td><td><table><tr><th>분포</th><th>N</th><th>%</th></tr><tr><td>남</td><td>51</td><td>41.7</td></tr><tr><td>여</td><td>69</td><td>58.3</td></tr></table></td></tr>
<tr><td colspan="2">• 치아 위치</td><td><table><tr><th>분포</th><th>N</th><th>%</th></tr><tr><td>전치(Anterior)</td><td>36</td><td>30.0</td></tr><tr><td>구치(Posterior)</td><td>84</td><td>70.0</td></tr><tr><td></td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>54</td><td>45.0</td></tr><tr><td>하악(Mandible)</td><td>66</td><td>55.0</td></tr></table></td></tr>
<tr><td colspan="2">• 역충전 재료</td><td><table><tr><th>분포</th><th>N</th><th>%</th></tr><tr><td>MTA</td><td>57</td><td>47.5</td></tr><tr><td>RRM</td><td>63</td><td>52.5</td></tr></table></td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td colspan="2">• 중재법</td><td>EMS using RRM (EndoSequence root repair material)</td></tr>
<tr><td colspan="2">• 비교치료법</td><td>EMS using MTA (Mineral trioxide aggregate)</td></tr>
<tr><td rowspan="2">추적관찰</td><td colspan="2">• Recall rate</td><td>49.4% (120/243)</td></tr>
<tr><td colspan="2">• 추적관찰기간</td><td>평균: 15개월, 최소: NR, 최대: NR</td></tr>
<tr><td>결과 평가기준</td><td colspan="2"></td><td>Success: complete/incomplete healing by Molven criteria and no symptom
Fail: uncertain/unsatisfactory healing by Molven criteria or any symptom</td></tr>
<tr><td>결과평가자 수</td><td colspan="2"></td><td>3명</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td></td><td>87.6%(120/137)</td></tr>
<tr><td>success rate</td><td></td><td>Overall success rate (실패원인: 방사선, 증상)
- 전체 93.3%(112/120), MTA 94.7%(114/120), RRM 92.0%(110/120)</td></tr>
<tr><td>결론</td><td colspan="2"></td><td>EMS는 충전재 종류와 상관없이 성공적 결과를 보임</td></tr>
<tr><td>기타</td><td colspan="2"></td><td></td></tr>
<tr><td>- 재정지원</td><td colspan="2"></td><td>공적지원
Department of Endodontics, University of Pennsylvania, Philadelphia, PA.</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="3">6</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="3">Arx (2018)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td colspan="2">후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td colspan="2">스위스</td></tr>
<tr><td>• 연구기관</td><td colspan="2">단일기관
- Department of Oral Surgery and Stomatology, University of Bern</td></tr>
<tr><td>• 연구기간</td><td colspan="2">NR</td></tr>
<tr><td rowspan="6">연구대상</td><td>• 포함기준</td><td colspan="2">- apicomarginal defect
- adjunctive use of EMD during apical surgery,
- minimum follow-up of 1 year.</td></tr>
<tr><td>• 제외기준</td><td colspan="2">NR</td></tr>
<tr><td>• 표본수</td><td colspan="2">환자수 (N=17), 치아수 (N=17)</td></tr>
<tr><td>• 표본수집방법</td><td colspan="2">NA</td></tr>
<tr><td>• 연령</td><td colspan="2">평균 50.0±18.2 (median 55, range 9-72)</td></tr>
<tr><td>• 성</td><td colspan="2"><table><tr><th>분포</th><th>N</th><th>%</th></tr><tr><td>남</td><td>8</td><td>47.1</td></tr><tr><td>여</td><td>9</td><td>52.9</td></tr></table></td></tr>
<tr><td></td><td>• 치아 위치</td><td colspan="2"><table><tr><th>분포</th><th>N</th><th>%</th></tr><tr><td>전치(Anterior)</td><td>11</td><td>64.7</td></tr><tr><td>소구치(Premolar)</td><td>1</td><td>5.9</td></tr><tr><td>대구치(molar)</td><td>5</td><td>29.4</td></tr><tr><td></td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>16</td><td>94.1</td></tr><tr><td>하악(Mandible)</td><td>1</td><td>5.9</td></tr></table></td></tr>
<tr><td>• 역충전 재료</td><td colspan="2">MTA 9명, BC RRM 5명, Composite 3명</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td colspan="2">Apical surgery</td></tr>
<tr><td>• 비교치료법</td><td colspan="2">NA</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td colspan="2">100%</td></tr>
<tr><td>• 추적관찰기간</td><td colspan="2">평균: 23.2개월(※계산) 최소: 1년, 최대: 5년</td></tr>
<tr><td>결과 평가기준</td><td colspan="3">Success: complete/incomplete healing by Molven criteria and no symptom
Doubtful: Absence of clinical signs/symptoms and uncertain radiographic healing,
Fail: uncertain/unsatisfactory healing by Molven criteria or any symptom</td></tr>
<tr><td>결과평가자 수</td><td colspan="3">2명</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td colspan="2">NR</td></tr>
<tr><td>success rate</td><td colspan="2">Overall success rate
- 성공 82.4%(14/17), 의심 5.9%(1/17), 실패 11.8%(2/17)</td></tr>
<tr><td>결론</td><td colspan="3">미세치근단수술 시 치근치주결손 치료를 위해 사용하는 EMD의 성공률은 다른 재생술식의 성공률과 유사함</td></tr>
<tr><td>기타</td><td colspan="3"></td></tr>
<tr><td>- 재정지원</td><td colspan="3">외부지원없음, No COI</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">7</td><td></td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Çaliskan (2016)</td><td></td></tr>
<tr><td rowspan="4">연구방법</td><td colspan="2">• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td colspan="2">• 연구국가</td><td>터키</td></tr>
<tr><td colspan="2">• 연구기관</td><td>단일기관
- Department of Endodontology, School of Dentistry, Ege University, Izmir, Turkey.</td></tr>
<tr><td colspan="2">• 연구기간</td><td>2007.6.-2013.12.</td></tr>
<tr><td rowspan="7">연구대상</td><td colspan="2">• 포함기준</td><td>anterior teeth with asymptomatic persistent periradicular periodontitis of strictly endodontic origin that failed after either nonsurgical or surgical treatment
- with a noncontributory medical history
- only one affected tooth per patient
- only single rooted maxillary and mandibular anterior teeth
- root filled teeth with asymptomatic periradicular periodontitis of strictly endodontic origin that failed after either nonsurgical or surgical treatment
- teeth with sufficient root length for root-end preparation in teeth containing post-core restoration
- teeth that exhibited an adequate coronal restoration without deficiencies and with no caries.</td></tr>
<tr><td colspan="2">• 제외기준</td><td>- teeth with pathoses associated with horizontal or vertical root fracture
- more than 5 mm of periodontal attachment and bone loss detected by periodontal probing
- teeth with perforation of cervical or lateral canal walls</td></tr>
<tr><td colspan="2">• 표본수</td><td>환자수 (N=108) 치아수(N=108)</td></tr>
<tr><td colspan="2">• 표본수집방법</td><td>NR</td></tr>
<tr><td colspan="2">• 연령</td><td>평균: NR
<table><tr><th>분포</th><th>N</th><th>%</th></tr><tr><td>16-30</td><td>39</td><td>43.3</td></tr><tr><td>31-50</td><td>30</td><td>33.3</td></tr><tr><td>51-65</td><td>21</td><td>23.3</td></tr></table></td></tr>
<tr><td colspan="2">• 성</td><td><table><tr><th>분포</th><th>N</th><th>%</th></tr><tr><td>남</td><td>52</td><td>57.8</td></tr><tr><td>여</td><td>38</td><td>42.2</td></tr></table></td></tr>
<tr><td colspan="2">• 치아 위치</td><td><table><tr><th>분포</th><th>N</th><th>%</th></tr><tr><td>Maxillary anteriors</td><td>70</td><td>77.8</td></tr><tr><td>Mandibular anteriors</td><td>20</td><td>22.2</td></tr></table></td></tr>
<tr><td colspan="2">• 역충전 재료</td><td>MTA 100%</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td colspan="2">• 중재법</td><td>Apical microsurgery</td></tr>
<tr><td colspan="2">• 비교치료법</td><td>NA</td></tr>
<tr><td rowspan="2">추적관찰</td><td colspan="2">• Recall rate</td><td>83.3%(90/108)</td></tr>
<tr><td colspan="2">• 추적관찰기간</td><td>평균: NR, 최소: 2년, 최대: NR</td></tr>
<tr><td>결과 평가기준</td><td colspan="3">- 방사선 치유양상 (Rud & Molven criteria), 증상 여부
- healed, uncertain, non-healed</td></tr>
<tr><td>결과평가자 수</td><td colspan="3">2명</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td colspan="2">NR</td></tr>
<tr><td>success rate
(실패원인:
방사선, 증상)</td><td colspan="2">Success rate
<table><tr><th rowspan="2">분포</th><th rowspan="2">N</th><th colspan="3">n</th><th rowspan="2">success rate(%)</th></tr><tr><th>healed</th><th>uncertain</th><th>non</th></tr></table></td></tr>
</table>

전체	90	72	5	13	80.0
성별					
남	52	44	2	6	84.6
여	38	28	3	7	73.7
연령					
16-30	39	32	2	5	82.0
31-50	30	23	2	5	76.7
51-65	21	17	1	3	80.9
위치					
Maxillary anteriors	70	56	4	10	80.0
Mandibular anteriors	20	16	1	3	80.0
추적관찰시기					
24 months	40	30	3	7	75.0
25-48 months	29	24	2	3	77.3
49-72 months	21	18	-	3	85.7

결론	MTA를 역충전재로 사용한 치근단 수술의 80%는 성공적이었음
기타	
- 재정지원	- No conflicts of interests

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">8</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Kim (2016)</td></tr>
<tr><td rowspan="3">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>한국</td></tr>
<tr><td>• 연구기관</td><td>단일기관
- 연세대학교 (Microscope Center of the Department of Conservative Dentistry at the Dental College, Yonsei University)</td></tr>
<tr><td></td><td>• 연구기간</td><td>2003.2 ~ 2010.10</td></tr>
<tr><td rowspan="7">연구대상</td><td>• 포함기준</td><td>증상 또는 무증상의 치근 치주염(apical periodontitis)이 있는 모든 역충전재 사용 환자</td></tr>
<tr><td>• 제외기준</td><td>Teeth with a through-and-through lesion and/or a lesion of combined periodontal endodontic origin, class II mobility or greater, horizontal and vertical root fractures, and perforations</td></tr>
<tr><td>• 표본수</td><td>환자수 (N=260) 치아수 (N=260)</td></tr>
<tr><td>• 표본수집방법</td><td>randomization</td></tr>
<tr><td>• 연령</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>〈20</td><td>5</td><td>2.75</td></tr><tr><td>21-30</td><td>38</td><td>20.88</td></tr><tr><td>31-40</td><td>48</td><td>26.37</td></tr><tr><td>41-50</td><td>32</td><td>17.58</td></tr><tr><td>51-60</td><td>32</td><td>17.58</td></tr><tr><td>〉60</td><td>27</td><td>14.84</td></tr></table></td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>남</td><td>63</td><td>34.62</td></tr><tr><td>여</td><td>119</td><td>65.38</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>전치(Anterior)</td><td>82</td><td>45.05</td></tr><tr><td>소구치(Premolar)</td><td>49</td><td>26.92</td></tr><tr><td>대구치(Molar)</td><td>51</td><td>28.02</td></tr></table>* table 1 에서 합산</td></tr>
<tr><td>• 역충전 재료</td><td><table><tr><th>분포</th><th>N</th><th>%</th></tr><tr><td>MTA</td><td>83</td><td>45.6</td></tr><tr><td>Super EBA</td><td>99</td><td>54.4</td></tr></table></td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Endodontic microsurgery - MTA</td></tr>
<tr><td>• 비교치료법</td><td>Endodontic microsurgery - Super EBA</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>1년 시점 74.0% (192/260)
4년 시점 70.0% (182/260)</td></tr>
<tr><td>• 추적관찰기간</td><td>최소 1년, 최대 4년</td></tr>
<tr><td>결과 평가기준</td><td colspan="2">1차변수 survival rate
- NR
2차변수 success rate
- 임상적 방사선학적으로 판단됨 (criteria used by Molven et al)
• Success: the absence of clinical signs and symptoms and radiographic evidence of complete or incomplete healing.
• failure: any clinical sign and/or symptom or radiographic evidence of uncertain healing or unsatisfactory healing.</td></tr>
<tr><td>결과평가자 수</td><td colspan="2">2명</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>96.7%(176/182)</td></tr>
<tr><td>success rate</td><td>* table 2 에서 합산</td></tr>
</table>

	시점	event	total	%
total	1년	181	192	92.81
충전재				
MTA	1년	63	67	94.03
Super EBA	1년	79	86	91.86
total	4년	165	182	90.7
충전재				
MTA	4년	76	83	91.6
Super EBA	4년	89	99	89.9

결론	치근단절제술 시 충전재로서 MTA와 Super EBA의 4년 성공률에 큰 차이가 없었으며, 단기 결과와 장기 추적 결과는 크게 다르지 않았음
기타	
- 재정지원	공적지원 - National Research Foundation of Korea (NRF) funded by the Ministry of Education (2015R1D1A1A09057552).

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">9</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Kruse (2016)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>덴마크</td></tr>
<tr><td>• 연구기관</td><td>단일기관
- Faculty of Science, University of Aarhus</td></tr>
<tr><td>• 연구기간</td><td>(모집기간)2005.06. - 2006.10.
(f/u 6년차 검사기간) 2012.03. - 2012.10.</td></tr>
<tr><td rowspan="6">연구대상</td><td>• 포함기준</td><td>프로토콜 참고(NCT 00228280)
healthy person age 18 or above sufficient root filling sufficient coronal restauration apical infection for at least 2 years Pai Score3, 4, or 5</td></tr>
<tr><td>• 제외기준</td><td>프로토콜 참고(NCT 00228280)
boneless more than 50 % communication between pocket and apical infection no visible root filling material after apicectomy facial bone less than 3 mm</td></tr>
<tr><td>• 표본수</td><td>44/52 (환자수/ 치아수)</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>6년 (문헌에서 성별로 평균연령, 범위만 제시하였음)
<table><tr><td>구분</td><td>n</td><td>mean</td><td>range</td></tr><tr><td>Total</td><td>33</td><td>62</td><td>40-85</td></tr><tr><td>남</td><td>16</td><td>65</td><td>41-77</td></tr><tr><td>여</td><td>17</td><td>61</td><td>40-85</td></tr></table>※Results 본문내용에서 추출</td></tr>
<tr><td>• 성</td><td><table><tr><td>구분</td><td>n</td><td>%</td></tr><tr><td>Total</td><td>33</td><td>100</td></tr><tr><td>남</td><td>16</td><td>48.48</td></tr><tr><td>여</td><td>17</td><td>51.52</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><td>구분</td><td>n</td><td>%</td></tr><tr><td>maxillary</td><td>16</td><td>84.21</td></tr><tr><td>mandibular</td><td>3</td><td>15.79</td></tr><tr><td></td><td></td><td></td></tr><tr><td>Anterior</td><td>6</td><td>31.58</td></tr><tr><td>premolar</td><td>13</td><td>68.42</td></tr></table>2p 본문내용 참고하여 추출 후 계산하였음.
※MTA 기준</td></tr>
<tr><td>• 역충전 재료</td><td><table><tr><td>구분</td><td>n</td><td>%</td></tr><tr><td>MTA (mineral trioxide aggregate)</td><td>19</td><td>48.72</td></tr><tr><td>GP (gutta-percha filling)</td><td>20</td><td>51.28</td></tr></table></td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Apicoectomy - 충전재 MTA</td></tr>
<tr><td>• 비교치료법</td><td>Apicoectomy - 충전재 GP</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>1년 f/u: 88.5% (46/52)
6년 f/u: 75% (39/52)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균: 6년 3개월 최소 : 5년 7개월 최대 : 7년</td></tr>
<tr><td>결과 평가기준</td><td colspan="2">survival rate: extraction
success rate:</td></tr>
</table>

<table>
<tr><td></td><td></td><td>the criteria described by Rud et al and Molven et al.(방사선)
- success
1. Complete healing
2. Incomplete healing (scar tissue)
- fail
3. Uncertain healing
4. Unsatisfactory healing</td></tr>
<tr><td>결과평가자 수</td><td></td><td>3명</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>84.2%(MTA 사용군 한정, 16/19)</td></tr>
<tr><td>success rate</td><td>
<table>
<tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr>
<tr><td>total</td><td>1년</td><td>25</td><td>39</td><td>64.1</td></tr>
<tr><td>충전재</td><td></td><td></td><td></td><td></td></tr>
<tr><td>GP</td><td>1년</td><td>10</td><td>20</td><td>50</td></tr>
<tr><td>MTA</td><td>1년</td><td>15</td><td>19</td><td>78.9</td></tr>
</table>
<table>
<tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr>
<tr><td>total</td><td>6년</td><td>27</td><td>39</td><td>69.23</td></tr>
<tr><td>충전재</td><td></td><td></td><td></td><td></td></tr>
<tr><td>GP</td><td>6년</td><td>11</td><td>20</td><td>55</td></tr>
<tr><td>MTA</td><td>6년</td><td>16</td><td>19</td><td>84.21</td></tr>
</table>
table 2 추출후 계산(score 1 + 2)</td></tr>
<tr><td>결론</td><td></td><td>MTA 그룹에서 GP 그룹에 비해 성공률이 더 높았음.
- The proportion of healed cases was larger in the MTA group than in the GP group at both the 1-year and 6-year follow-up.</td></tr>
<tr><td>기타</td><td></td><td></td></tr>
<tr><td>- 재정지원</td><td></td><td>지원없음
- The authors deny any conflicts of interest related to this study.</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">10</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Shinbori (2015)</td></tr>
<tr><td rowspan="3">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>미국</td></tr>
<tr><td>• 연구기관</td><td>단일기관
- Department of Endodontics, Baylor College of Dentistry, Texas A&M University System Health Science Cneter, Dallas, USA</td></tr>
<tr><td></td><td>• 연구기간</td><td>2009-2013</td></tr>
<tr><td rowspan="6">연구대상</td><td>• 포함기준</td><td>- A tooth that had surgical root canal treatment where ES-BCRR was used as the retrofilling material
- Adequate existing root canal treatment
- American Society of Anesthesiologists I or II
- Radiographs documenting pretreatment, post-treatment, and follow-up of good diagnostic quality
- Documented 1-year minimum recall</td></tr>
<tr><td>• 제외기준</td><td>- preexisting vertical root fracture, which was seen radiographically as a J-shaped radiolucency</td></tr>
<tr><td>• 표본수</td><td>환자수(N=94), 치아수(N=113)</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>49 (range 20~88 yrs) (환자 수 기준, 표는 치아수 기준)
<table><tr><th>분포</th><th>N</th><th>%</th></tr><tr><td>〈=45</td><td>50</td><td>44.2</td></tr><tr><td>〉45</td><td>63</td><td>55.8</td></tr></table></td></tr>
<tr><td>• 성</td><td><table><tr><th>분포</th><th>N</th><th>%</th></tr><tr><td>남</td><td>50</td><td>44.2</td></tr><tr><td>여</td><td>63</td><td>55.8</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th>분포</th><th>N</th><th>%</th></tr><tr><td>Maxillary anteriors</td><td>21</td><td>18.6</td></tr><tr><td>Maxillary premolars</td><td>17</td><td>15.0</td></tr><tr><td>Maxillary molars</td><td>30</td><td>26.5</td></tr><tr><td>Mandibular anteriors</td><td>6</td><td>5.3</td></tr><tr><td>Mandibular premolars</td><td>11</td><td>9.7</td></tr><tr><td>Mandibular molars</td><td>28</td><td>24.8</td></tr><tr><td>Total</td><td>113</td><td>100.0</td></tr></table></td></tr>
<tr><td>• 역충전 재료</td><td>ES-BC sealer and ES-BCRR putty 100%</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Endodontic microsurgery</td></tr>
<tr><td>• 비교치료법</td><td>NA</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>NA (retrospective study)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균: 14.5개월, 최소: 12개월, 최대: 33개월</td></tr>
<tr><td>결과 평가기준</td><td colspan="2">- 방사선 치유양상 (Rud & Molven criteria), 증상 여부
- healed, healing, non-healing</td></tr>
<tr><td>결과평가자 수</td><td colspan="2">2명</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>NR</td></tr>
<tr><td>success rate</td><td>Success: 전체 92.0%(104/113)</td></tr>
</table>

분포	N	n			success rate(%)
		healed	healing	failed	
전체	113	92	12	9	92.0
성별					
남	50	44	2	4	92.0
여	63	48	10	5	92.1
연령					
〈=45	50	41	4	5	90.0
〉45	63	51	8	4	93.7
위치					
Maxillary anteriors	21	19	1	1	95.2
Maxillary premolars	17	15	1	1	94.1
Maxillary molars	30	26	2	2	93.3
Mandibular anteriors	6	5	1	0	100.0
Mandibular premolars	11	9	1	1	90.9
Mandibular molars	28	18	6	4	85.7

결론	ES-BCRR는 치근단수술에서 적합한 역충전재료임
기타	
- 재정지원	- 지원 없음, No conflicts of interests

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">11</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Tawil (2015)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>미국</td></tr>
<tr><td>• 연구기관</td><td>다기관
- endodontic private practice setting</td></tr>
<tr><td>• 연구기간</td><td>2009 ~ 2010 수술받은 환자</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>- All root-filled cases diagnosed with symptomatic or asymptomatic apical periodontitis as defined by the American Association of Endodontists' Consensus Conference Recommended Diagnostic Terminology were included.</td></tr>
<tr><td>• 제외기준</td><td>- Teeth with severe periodontal mobility (class II or greater), furcation involvement, localized probing defects greater than 5 mm, and any form of perforations were excluded from the study</td></tr>
<tr><td>• 표본수</td><td>NR/ 155(사람수/ 치아수)</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td><table><tr><td>구분</td><td>n</td><td>%</td></tr><tr><td>〈40</td><td>95</td><td>61.29</td></tr><tr><td>〉40</td><td>60</td><td>38.71</td></tr></table>table 1 참고하여 계산하였음(n=155) (환자수 = 치아수)</td></tr>
<tr><td>• 성</td><td><table><tr><td>구분</td><td>n</td><td>%</td></tr><tr><td>남</td><td>67</td><td>43.23</td></tr><tr><td>여</td><td>88</td><td>56.77</td></tr></table>table 1 참고하여 계산하였음(n=155) (환자수 = 치아수)</td></tr>
<tr><td>• 치아 위치</td><td><table><tr><td>구분</td><td>n</td><td>%</td></tr><tr><td>Anterior</td><td>64</td><td>41.29</td></tr><tr><td>Posterior</td><td>91</td><td>58.71</td></tr></table>table 1 참고하여 계산하였음.(n=155) (환자수 = 치아수)</td></tr>
<tr><td>• 역충전 재료</td><td>- Gray ProRoot MTA(Mineral trioxide aggregate) (Dentsply Maillefer)
- SuperEBA (Bosworth, Skokie, IL)</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Periapical microsurgery</td></tr>
<tr><td>• 비교치료법</td><td>NA</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>1년: 86.45% (134/ 155)
3년: 81.94%(127/ 155)
table 3 참고하여 계산하였음.</td></tr>
<tr><td>• 추적관찰기간</td><td>평균: NR 최소: 1년 최대: 3년</td></tr>
<tr><td>결과 평가기준</td><td colspan="2">survival rate: NR
success rate:
criteria based on the work of Rud et al, Molven et al, and Grung et al.
(임상, 방사선)
(1) healed: included the absence of clinical signs and symptoms with radiographic evidence of complete radiographic healing (re-establishment of the lamina dura) and (2) not healed: the criteria for unsuccessful outcome included any abnormal clinical signs and/or radiographic evidence (increase, no apparent changes, reduction, or</td></tr>
</table>

<table>
<tr><td></td><td></td><td>incomplete resolution of the periapical radiolucency size without re-establishment of the lamina dura)</td></tr>
<tr><td>결과평가자 수</td><td></td><td>2</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>NR</td></tr>
<tr><td>success rate</td><td>
<table>
<tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr>
<tr><td>total</td><td>1년</td><td>73</td><td>77</td><td>97.8</td></tr>
<tr><td>total</td><td>3년</td><td>71</td><td>73</td><td>97.3</td></tr>
</table>
table 3. intatct 그룹의 성공률 추출</td></tr>
<tr><td>결론</td><td></td><td>dentinal defects가 있는 치아에서보다 intact root 치아에서 수술 성공률이 더 높았음.
- This prospective periapical microsurgery study showed a significant superior clinical outcome for intact roots when compared with roots with dentinal defects at both 1 year and at 3 years postoperatively.</td></tr>
<tr><td>기타</td><td></td><td></td></tr>
<tr><td>- 재정지원</td><td></td><td>지원없음
- The authors deny any conflicts of interest related to this study</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">12</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Li (2014)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>중국</td></tr>
<tr><td>• 연구기관</td><td>단일기관
- Department of Endodontics, Dental School, Capital Medical University, Beijing, China</td></tr>
<tr><td>• 연구기간</td><td>2007.4 - 2010.10</td></tr>
<tr><td rowspan="6">연구대상</td><td>• 포함기준</td><td>- 치근단절제술 받은 모든 환자
- All patients exhibited fair periodontal health status
- preoperative probing depths were 〈3 mm without attachment loss</td></tr>
<tr><td>• 제외기준</td><td>- Patients with medical contrain dications for (oral) surgical procedures, such as obvious root fractures and combined endodontic-periodontal lesions, were excluded before treatment.
- Cases lacking any of these radiographic studies were excluded.</td></tr>
<tr><td>• 표본수</td><td>94/116 (환자수 / 치아수)</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>≤ 40</td><td>70</td><td>69.3</td></tr><tr><td>40</td><td>31</td><td>30.7</td></tr></table>- 분포를 치아수 기준으로 제시하였음</td></tr>
<tr><td>• 성</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>남</td><td>41</td><td>40.6</td></tr><tr><td>여</td><td>60</td><td>59.4</td></tr></table>- 분포를 치아수 기준으로 제시하였음</td></tr>
<tr><td>• 치아 위치</td><td><table><tr><td>구분</td><td>N</td><td>%</td></tr><tr><td>Anterior</td><td>70</td><td>69.31</td></tr><tr><td>premolars</td><td>15</td><td>14.85</td></tr><tr><td>molars</td><td>16</td><td>15.84</td></tr><tr><td></td><td></td><td></td></tr><tr><td>Maxillary</td><td>77</td><td>76.24</td></tr><tr><td>Mandibular</td><td>24</td><td>23.76</td></tr></table></td></tr>
<tr><td>• 역충전 재료</td><td>SuperEBA (100%)</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Microsurgery</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>치아: 87.07% (101 / 116)
환자: 87.20% (82 / 94)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR 최소 : 2년 최대: NR</td></tr>
<tr><td>결과 평가기준</td><td colspan="2">Survival rate: NR
Success rate:
(임상적, 방사선) criteria used by Molven et al (방사선)
Success: the absence of clinical signs and/or symptoms and radiographic evidence of complete or incomplete healing.
Failure: any clinical signs and/or symptoms and radiographic evidence of uncertain or unsatisfactory healing</td></tr>
<tr><td>결과평가자 수</td><td colspan="2">2명</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>NR</td></tr>
<tr><td>success rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>total</td><td>2년</td><td>94</td><td>101</td><td>93.1</td></tr></table></td></tr>
</table>

연령별					
≤40	2년	64	70	91.4
40	2년	30	31	96.8
성별					
남	2년	39	41	95.1
여	2년	55	60	91.7
위치 1					
전치(Anterior)	2년	63	70	90
소구치(Premolar)	2년	15	15	100
대구치(Molar)	2년	16	16	100
위치 2					
상악(Maxilla)	2년	73	77	94.81
하악(Mandible)	2년	21	24	87.5

결론	Super EBA를 역충전 재료로 사용한 수술에서 93.1%의 높은 치료율(healing rate)를 보였음. - In conclusion, microsurgery using SuperEBA as root-end filling material resulted in a high healing rate (93.1%) of PED at the 2-year follow-up examination, showing that this procedure is an appropriate PED treatment.
기타	
- 재정지원	공적지원 - This study was supported by the National Natural Science Foundation of China (no. 81170952) and The Capital Health Research and Development of Special (no. 2011-1014-05).

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">13</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Tortorici (2014)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>이탈리아</td></tr>
<tr><td>• 연구기관</td><td>단일기관
- the Department of Stomatological Science of the University of Palermo</td></tr>
<tr><td>• 연구기간</td><td>1985 ~ 2005</td></tr>
<tr><td rowspan="6">연구대상</td><td>• 포함기준</td><td>수술후 기록 확인 가능한 환자</td></tr>
<tr><td>• 제외기준</td><td>(1) unsatisfactory orthograde root filling, determined radiographically (short or insufficient condensation)
(2) teeth with advanced periodontal disease (93-mm pocket depth) or if the marginal bone level was entered as zero.</td></tr>
<tr><td>• 표본수</td><td>195/206 환자수/치아수 1년 기준) (현미경 사용 그룹 기준)</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>NR</td></tr>
<tr><td>• 성</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>남</td><td>116</td><td>59.49</td></tr><tr><td>여</td><td>79</td><td>40.51</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td>※Group 2(현미경 사용 그룹)<table><tr><th>분포</th><th>N</th><th>%</th></tr><tr><td>전치(Anterior)</td><td>84</td><td>40.78</td></tr><tr><td>소구치(Premolar)</td><td>59</td><td>28.64</td></tr><tr><td>대구치(Molar)</td><td>63</td><td>30.58</td></tr><tr><td></td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>138</td><td>66.99</td></tr><tr><td>하악(Mandible)</td><td>68</td><td>33.01</td></tr></table></td></tr>
<tr><td>• 역충전 재료</td><td>1993년 까지: SA (Silver amalgam)(without zinc non-gamma-2)
1993년 이후: MTA</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Endodontic surgery</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>100% (206 / 206) 1년 시점 현미경 사용 그룹</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR 최소 : 1년 최대 : NR년</td></tr>
<tr><td>결과 평가기준</td><td colspan="2">Survival rate: NR
Success rate:
Clinical success: complete / partial healing
Clinical Failure: Uncertain Unsatisfactory<table><tr><td>successful or complete healing</td><td>when patients showed a complete root canal filling and had bony regeneration, as well as the absence of signs and symptoms such as mobility, pain, and swelling.</td></tr><tr><td>partial healing (incomplete healing)</td><td>when patients had a complete root canal filling and absence of symptoms, but their intraoral periapical radiographs showed periapical radiotransparency smaller than that before the</td></tr></table></td></tr>
</table>

	intervention.
uncertain healing	when the tooth had a complete root canal filling and absence of symptoms, and intraoral periapical radiographs showed periapical radiotransparency smaller than that before the intervention, but there were cystic images (radiotransparency surrounded by hard lamina) or root resorption.
no healing(failure)	when subjects showed postoperative signs and symptoms, such as pain, gingival swelling, mobility, hypersensitivity, tenderness on percussion, and tenderness on palpation on the crown and/or in the apical area

결과평가자 수: NR

결과

survival rate: NR

success rate:

1) 1년 (현미경 사용 그룹 대상)

	시점	event	total	%
total	1년	186	206	90.29
위치 1				
전치(Anterior)	1년	75	84	89.29
소구치(Premolar)	1년	54	59	91.53
대구치(Molar)	1년	57	63	90.48
위치 2				
상악(Maxilla)	1년	127	138	92.03
하악(Mandible)	1년	59	68	86.76

결론

현대적 치근단절제술은 기존 수술법에 비해 성공가능성이 5배 높음.

- In conclusion, modern apicoectomy resulted in a probability of success more than 5 times higher (odds ratio, 5.20 [95% confidence interval, 3.94Y6.92]; P G 0.001) compared with the traditional technique

기타

- 재정지원: 지원없음
  - The authors report no conflicts of interest

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">14</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Taschieri (2013)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 코호트 연구</td></tr>
<tr><td>• 연구국가</td><td>이탈리아</td></tr>
<tr><td>• 연구기관</td><td>NR</td></tr>
<tr><td>• 연구기간</td><td>2001년 - 2005년</td></tr>
<tr><td rowspan="7">연구대상</td><td>• 포함기준</td><td>1) “the tooth treated surgically had periradicular lesion of strictly endodontic origin and non-surgical re-treatment had previously failed.”
2) “the tooth treated surgically exhibited an adequate final restoration with no clinical evidence of coronal leakage”
3) “the apical root canal had 6 mm or more without the presence of a post; no acute symptoms were present.”
4) “the patients had no general medical contraindications for oral surgical procedures (they were ASA-1 or ASA-2).”
5) “the diameter of the periapical lesion ranged between 3 and 10 mm”
6) single-rooted and multi-rooted teeth were included.”
(reference: Taschieri S. (2008))</td></tr>
<tr><td>• 제외기준</td><td>1) Teeth with pathosis associated with vertical root fracture
2) Teeth with perforation of the furcation area or lateral canal walls
3) Teeth with traumatic injuries
4) Severe periodontal bone loss detected with a periodontal probe (probing depth greater than 5 mm)”
(reference: Taschieri S. (2008))</td></tr>
<tr><td>• 표본수</td><td>Surgical microsope(SM group) : 36명/ 63개</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>현미경 활용 수술만 포함
(문헌에서 성별 평균을 보고하였음)
<table><tr><th colspan="2">분포</th><th>N</th><th>Mean</th></tr><tr><td rowspan="2">SM group</td><td>남</td><td>16</td><td>40</td></tr><tr><td>여</td><td>20</td><td>41</td></tr></table></td></tr>
<tr><td>• 성</td><td><table><tr><th colspan="2">분포</th><th>N</th><th>%</th></tr><tr><td rowspan="2">SM group</td><td>남</td><td>16</td><td>44.4</td></tr><tr><td>여</td><td>20</td><td>55.6</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>Anterior</td><td>33</td><td>58.93</td></tr><tr><td>premolars</td><td>13</td><td>23.21</td></tr><tr><td>molars</td><td>10</td><td>17.86</td></tr><tr><td></td><td></td><td></td></tr><tr><td>Maxillary</td><td>32</td><td>57.14</td></tr><tr><td>Mandibular</td><td>24</td><td>42.86</td></tr></table></td></tr>
<tr><td>• 역충전 재료</td><td>NR</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>microsurgical endodontic treatment using the surgical microscope</td></tr>
<tr><td>• 비교치료법</td><td>microsurgical endodontic treatment using magnifying loupes</td></tr>
<tr><td>추적관찰</td><td>• Recall rate</td><td>1년: 92.06% (58/63) (현미경 사용 그룹 기준)</td></tr>
</table>

<table>
<tr><td></td><td>• 추적관찰기간</td><td colspan="2">평균 :NR 최소 : 1년 최대 : 4년</td></tr>
<tr><td>결과 평가기준</td><td></td><td colspan="2">Survival rate: NR
Success rate:
Success(criteria proposed by Molven)
(1) “success”
- ‘complete healing’ (radiographic and clinical normalcy)
- ‘incomplete healing’ (clinical normalcy combined with a remarkable reduced radiolucency)
(2) “uncertain healing”
- persistence of radiolucency in the absence of clinical signs and symptoms, or presence of clinical signs/symptoms (clinical questionable) associated with a not complete radiographic healing
(3) “failure”
- presence of clinical signs and symptoms combined with persistent radiolucency.</td></tr>
<tr><td>결과평가자 수</td><td></td><td colspan="2">2 명</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td colspan="2">NR</td></tr>
<tr><td>success rate</td><td colspan="2">● 4년 결과 (table 1 참고하여 SM group 계산)
<table>
<tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr>
<tr><td>total</td><td>4년</td><td>56</td><td>58</td><td>96.55</td></tr>
<tr><td>위치 1</td><td></td><td></td><td></td><td></td></tr>
<tr><td>전치(Anterior)</td><td>4년</td><td>33</td><td>35</td><td>94.29</td></tr>
<tr><td>소구치(Premolar)</td><td>4년</td><td>13</td><td>13</td><td>100</td></tr>
<tr><td>대구치(Molar)</td><td>4년</td><td>10</td><td>10</td><td>100</td></tr>
<tr><td>위치 2</td><td></td><td></td><td></td><td></td></tr>
<tr><td>상악(Maxilla)</td><td>4년</td><td>32</td><td>34</td><td>94.12</td></tr>
<tr><td>하악(Mandible)</td><td>4년</td><td>24</td><td>24</td><td>100</td></tr>
</table></td></tr>
<tr><td>결론</td><td></td><td colspan="2">수술적 루페(Surgical loupe) 또는 현미경(microscope)을 사용한 수술 간의 치료 결과에서 통계적으로 유의한 차이가 없었음.
- No statistically significant difference was found in the treatment results relating to the type of magnification device.</td></tr>
<tr><td>기타</td><td></td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td></td><td colspan="2">지원없음 (Not reported)</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">15</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Goyal (2011)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>인도</td></tr>
<tr><td>• 연구기관</td><td>단일기관
- Department of Conservative Dentistry and Endodontics, Government Dental College, Rohtak, Haryana, India.</td></tr>
<tr><td>• 연구기간</td><td>2004-2006</td></tr>
<tr><td rowspan="9">연구대상</td><td>• 포함기준</td><td>suppurative chronic apical periodontitis, apicomarginal communication으로 치근단 수술에 의뢰된 환자
- recurrent episodes of purulent discharge
- apicomarginal communication having a pocket depth (PD) of 〉6 mm confined to buccal aspect
- negative response to vitality tests with radiographic evidence of periapical radiolucencies
- failed previous root canal treatment
- failed previous surgery with persistent bony lesion
- adequate final restoration with no clinical evidenceof coronal leakage</td></tr>
<tr><td>• 제외기준</td><td>- clinical or radiographic evidence of vertical root fracture
- resorptive processes involving more than the apical third of the root
- chronic generalized periodontitis
- systemic disease contraindicating oral surgery(uncontrolled diabetes, tuberculosis)</td></tr>
<tr><td>• 표본수</td><td>환자수 (N=30), 치아수 (N=30)</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>17-45 yrs</td></tr>
<tr><td>• 성</td><td>17 males, 13 females (※ 최종 참여한 25명 대상 자료는 없음)</td></tr>
<tr><td>• 치아 위치</td><td>NR</td></tr>
<tr><td>• 역충전 재료</td><td>MTA 100%</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>PRP, PRP+Collagen</td></tr>
<tr><td>• 비교치료법</td><td>Collagen</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>83.3%(25/30)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균: NR, 최소: 1년, 최대: NR</td></tr>
<tr><td>결과 평가기준</td><td colspan="2">방사선 치유양상 (Rud & Molven criteria), 증상 여부</td></tr>
<tr><td>결과평가자 수</td><td colspan="2">2명</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>Survival rate: NR</td></tr>
<tr><td>success rate</td><td>Success rate: 전체 84%, PRP 83.3%, RPR+Collagen 88.9%, Collagen 80%
<table>
<tr><th></th><th>Collagen (n=10)</th><th>PRP (n=6)</th><th>PRP+collagen sponge (n=9)</th><th>Total (n=25)</th></tr>
<tr><td>Complete</td><td>7</td><td>5</td><td>7</td><td>19</td></tr>
<tr><td>Incomplete</td><td>1</td><td>0</td><td>1</td><td>2</td></tr>
<tr><td>Uncertain</td><td>2</td><td>1</td><td>1</td><td>4</td></tr>
<tr><td>Unsatisfactory</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
</table></td></tr>
<tr><td>결론</td><td colspan="2">PRP, PRP+Collagen은 apicomarginal defect 치료하는데 있어 GTR membrane을 대체할 수 있을 것임</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">- 지원 없음, No conflicts of interests</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">16</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Song (2011)</td></tr>
<tr><td rowspan="3">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>한국</td></tr>
<tr><td>• 연구기관</td><td>단일기관
- 연세대학교 (Microscope Center of the Department of Conservative Dentistry at the Dental College, Yonsei University)</td></tr>
<tr><td>• 연구기간</td><td>August 2004 and December 2008</td></tr>
<tr><td rowspan="6">연구대상</td><td>• 포함기준</td><td>수술적 근관치료를 필요로 하는 치아
(12개월 이상 추적관찰이 가능한 환자)</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>환자수 (N=491), 치아수 (N=584)</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>
<table>
<tr><th></th><th>N</th><th>%</th></tr>
<tr><td>〈20</td><td>3</td><td>0.6</td></tr>
<tr><td>21-30</td><td>99</td><td>20.2</td></tr>
<tr><td>31-40</td><td>140</td><td>28.5</td></tr>
<tr><td>41-50</td><td>81</td><td>16.5</td></tr>
<tr><td>51-60</td><td>79</td><td>16.1</td></tr>
<tr><td>〉60</td><td>89</td><td>18.1</td></tr>
</table>
* table 2 Endo + endo-perio에서 합산</td></tr>
<tr><td>• 성</td><td>
<table>
<tr><th></th><th>N</th><th>%</th></tr>
<tr><td>남</td><td>192</td><td>39.1</td></tr>
<tr><td>여</td><td>299</td><td>60.9</td></tr>
</table>
* table 2 Endo + endo-perio에서 합산</td></tr>
<tr><td>• 치아 위치</td><td>
<table>
<tr><th></th><th>N</th><th>%</th></tr>
<tr><td>전치(Anterior)</td><td>268</td><td>54.6</td></tr>
<tr><td>소구치(Premolar)</td><td>121</td><td>24.6</td></tr>
<tr><td>대구치(Molar)</td><td>102</td><td>20.8</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>상악(Maxilla)</td><td>306</td><td>71.00</td></tr>
<tr><td>하악(Mandible)</td><td>125</td><td>29.00</td></tr>
</table>
* table 2 Endo + endo-perio에서 합산</td></tr>
<tr><td>• 역충전 재료</td><td>
<table>
<tr><th>분포</th><th>N</th><th>%</th></tr>
<tr><td>MTA</td><td>250</td><td>52.4</td></tr>
<tr><td>Super EBA</td><td>117</td><td>24.5</td></tr>
<tr><td>IRM</td><td>110</td><td>23.1</td></tr>
</table></td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>치근단수술 (endodontic microsurgery)</td></tr>
<tr><td>• 비교치료법</td><td>–</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>NR</td></tr>
<tr><td>• 추적관찰기간</td><td>평균: NR 최소: 1년</td></tr>
<tr><td>결과 평가기준</td><td colspan="2">1차변수 survival rate
-NR
2차변수 success rate
임상적 방사선학적으로 판단됨 (criteria used by Molven et al)
successful outcome: absence of clinical signs and/or symptoms and radiographic evidence of complete or incomplete healing.
failure: any clinical signs and/or symptoms or radiographic evidence of uncertain or unsatisfactory healing.</td></tr>
</table>

결과평가자 수		
결과	survival rate	- NR
	success rate	- table 2 Endo + endo-perio에서 합산

	시점	event	total	%
total	overall	409	491	83.3

결론	• Under the control of the significant variables in logistic regression, the potential prognostic factors on the outcome were sex, tooth position, lesion type, and root-end filling material. On the other hand, the tooth position was a pure predictor of an endodontic lesion affecting the clinical outcome
기타	
- 재정지원	**공적지원** Supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education, Science and Technology (2010-0021281)

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">17</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Taschieri (2011)</td></tr>
<tr><td rowspan="3">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>이탈리아</td></tr>
<tr><td>• 연구기관</td><td>단일기관 (기관 명시 안되어 있어 저자 기관으로 기술)
- Department of Health Technologies, IRCCS Istituto Ortopedico Galeazzi, University of Milan</td></tr>
<tr><td></td><td>• 연구기간</td><td>2000.12 - 2005.09 (5년)</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>1) The tooth treated surgically showed a periradicular lesion of strictly endodontic origin, and nonsurgical retreatment was considered unfeasible or had previously failed.
2) The minimum diameter of the bone defect, as determined from periapical radiographs, was at least 10 mm.
3) The tooth treated surgically exhibited adequate final restoration with no clinical evidence of coronal leakage.
4) Patients had no general medical contraindications for oral surgical procedures (American Society of Anesthesiologists [ASA]-1 or ASA-2 rating).
(reference: Taschieri S. (2007))</td></tr>
<tr><td>• 제외기준</td><td>1) Teeth with pathosis associated with vertical root fracture
2) Teeth with perforation of the furcation area or lateral canal walls
3) Teeth with traumatic injuries
4) Severe periodontal bone loss detected with a periodontal probe (probing depth greater than 5 mm)</td></tr>
<tr><td>• 표본수</td><td>38 / 49 (환자수/치아수)</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>1년 (본문에서 성별 평균연령을 제시하고 있음)
<table><tr><th>분포</th><th>N</th><th>Mean</th></tr><tr><td>남</td><td>16</td><td>43</td></tr><tr><td>여</td><td>22</td><td>37</td></tr></table></td></tr>
<tr><td>• 성</td><td>1년
<table><tr><th>분포</th><th>N</th><th>%</th></tr><tr><td>남</td><td>16</td><td>42.11</td></tr><tr><td>여</td><td>22</td><td>57.89</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>total</th><th>%</th></tr><tr><td>total</td><td>49</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>35</td><td>71.43</td></tr><tr><td>소구치(Premolar)</td><td>11</td><td>22.45</td></tr><tr><td>대구치(Molar)</td><td>3</td><td>6.12</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>32</td><td>65.31</td></tr><tr><td>하악(Mandible)</td><td>17</td><td>34.69</td></tr></table></td></tr>
<tr><td>• 역충전 재료</td><td><table><tr><th>분포</th><th>N</th><th>%</th></tr><tr><td>A zinc-oxide EBA-reinforced cement</td><td>49</td><td>100</td></tr></table></td></tr>
<tr><td>중재법 및 비교치료법</td><td>• 중재법</td><td>Endodontic microsurgery</td></tr>
<tr><td></td><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>1년(12개월): 100% (49/49) (38명, 49개 치아)
4년(48개월): 87.76% (43/49) (33명, 43개 치아)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균: NR 최소 : 1년 최대 : 48개월</td></tr>
</table>

survival rate: NR
success rate:
1년 f/u: **(healing categories proposed by Molven et al)**
(1) success: complete healing
(2) doubtful: incomplete healing, uncertain healing
(3) failure: unsatisfactory outcome

4년 f/u 기준

결과 평가기준

(1) "success"
- radiographic classification of complete healing with absence of clinical signs/symptoms (clinical success)
(2) "doubtful"
(3) "failure"
- radiographic classification of unsatisfactory
- uncertain healing in the presence of any clinical signs/symptoms(clinical failure).

(clinical criteria proposed by Gutmann and Harrison)

결과평가자 수: 2 명

결과

survival rate: NR

success rate

success rate

● 1년 기준 성공률 (table 1을 통해 계산)

	시점	event	total	%
total	1년	38	49	77.55
위치 1				
전치(Anterior)	1년	28	35	80.0
소구치(Premolar)	1년	8	11	72.7
대구치(Molar)	1년	2	3	66.7
위치 2				
상악(Maxilla)	1년	23	32	71.9
하악(Mandible)	1년	15	17	88.2

● 4년 기준 성공률 (table 2를 통해 계산)

	시점	event	total	%
total	4년	38	43	88.4
위치 1				
전치(Anterior)	4년	27	30	90
소구치(Premolar)	4년	8	10	80
대구치(Molar)	4년	3	3	100
위치 2				
상악(Maxilla)	4년	24	28	85.7
하악(Mandible)	4년	14	15	93.3

결론

치근단 수술과 유도 조직 재생의 연관성은 최대 4년 까지 우수한 결과를 보임.
- The association of endodontic surgery and guided tissue regeneration for the treatment of through-and through periapical lesions leads to excellent outcomes up to 4 years.

기타: 논문에 제시된 total 성공률과 치아위치별 성공률의 숫자가 일치하지 않아, 치아위치에 따른 total값으로 재계산함

- 재정지원: 지원없음
- The authors declare that they have no conflict of interest.

1.2 의도적 재식술

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">1</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Wu (2020)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>대만</td></tr>
<tr><td>• 연구기관</td><td>Department of Stomatology at Taichung Veterans General Hospital (Taichung, Taiwan)</td></tr>
<tr><td>• 연구기간</td><td>2006. 6월 ~2018. 12월</td></tr>
<tr><td rowspan="7">연구대상</td><td>• 포함기준</td><td>- teeth that had been accepted nonsurgical root canal treatment (NSRCT), nonsurgical root canal retreatment or periapical surgery, but signs and symptoms of non-healing were not subsided or persistence in periapical radiolucency</td></tr>
<tr><td>• 제외기준</td><td>- Patients at age under 20 years and those follow-up periods less than 6 months</td></tr>
<tr><td>• 표본수</td><td>치아 215개 (199명)</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>평균연령: 44.3 ± 12.4
<table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>≤40</td><td>85</td><td>39.5</td></tr><tr><td>>40</td><td>130</td><td>60.5</td></tr></table></td></tr>
<tr><td>• 성</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>남</td><td>71</td><td>33</td></tr><tr><td>여</td><td>144</td><td>67</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>전치(Anterior)</td><td>19</td><td>8.8</td></tr><tr><td>소구치(Premolar)</td><td>50</td><td>23.3</td></tr><tr><td>대구치(Molar)</td><td>146</td><td>67.9</td></tr><tr><td>상악(Maxilla)</td><td>78</td><td>36.3</td></tr><tr><td>하악(Mandible)</td><td>137</td><td>63.7</td></tr></table></td></tr>
<tr><td>• 역충전 재료</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>MTA /Biodentine</td><td>195</td><td>90.7</td></tr><tr><td>SuperEBA</td><td>20</td><td>9.3</td></tr></table></td></tr>
<tr><td>• 구외 조작시간 (EO time)</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td><30 min</td><td>178</td><td>82.8</td></tr><tr><td>>30 min</td><td>37</td><td>17.2</td></tr></table></td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>의도적 재식술</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>74.39% (215 / 289)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균: NR 최소: 6개월 최대: 120개월</td></tr>
<tr><td>결과 평가기준</td><td colspan="2">- clinical radiographic examinations</td></tr>
<tr><td>결과평가자 수</td><td colspan="2">NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>4y 76.7%</td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">- 향상된 현대기술로 시행되는 의도적 재식술은 믿을 수 있고 함께 실행 가능하며 장기적으로 높은 생존율(82.8 %)을 보임
- 만약 이식된 치아가 수술 전-후 검사에서 급성 또는 만성의 치근단 농양으로 진단되었다면 수술 실패 위험성은 다른 상태로 진단된 치아에 비해 2.7 배 더 높게 측정되었음
- 재식술 치아 표면에 EMD 적용은 치주기구의 형성과 재생 촉진을 도모하여 기능 작동율 증대와 치료효과를 향상시킴</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">NR</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">2</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Park (2017)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>대한민국</td></tr>
<tr><td>• 연구기관</td><td>전남대학교 치과병원</td></tr>
<tr><td>• 연구기간</td><td>2009.1월~2016.12월</td></tr>
<tr><td rowspan="7">연구대상</td><td>• 포함기준</td><td>NR</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>치아 50개 (50명)</td></tr>
<tr><td>• 표본수집방법</td><td>전남대학교치과병원 PACS (Picture archiving and communication system)에서 “study comments”에 intentional replantation을 입력하여 증례를 찾음</td></tr>
<tr><td>• 연령</td><td>평균연령: 39.1 ± 16.4
<table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>≤19</td><td>3</td><td>6</td></tr><tr><td>20~29</td><td>13</td><td>26</td></tr><tr><td>30~39</td><td>7</td><td>14</td></tr><tr><td>40~49</td><td>7</td><td>14</td></tr><tr><td>50~59</td><td>9</td><td>18</td></tr><tr><td>60~69</td><td>10</td><td>20</td></tr><tr><td>70≤</td><td>1</td><td>2</td></tr></table></td></tr>
<tr><td>• 성</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>남</td><td>32</td><td>36</td></tr><tr><td>여</td><td>18</td><td>32</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>전치(Anterior)</td><td>5</td><td>10</td></tr><tr><td>구치(Posterior)</td><td>45</td><td>90</td></tr><tr><td>상악(Maxilla)</td><td>19</td><td>38</td></tr><tr><td>하악(Mandible)</td><td>31</td><td>62</td></tr></table></td></tr>
<tr><td>• 역충전 재료</td><td>MTA, IRM</td></tr>
<tr><td>• 구외 조작시간 (EO time)</td><td>NR</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>의도적 재식술</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>100% (50 / 50)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균: 18.8 ±15.6개월, 최소: NR 최대: NR</td></tr>
<tr><td>결과 평가기준</td><td colspan="2">방사선학적 특징과 병소의 크기</td></tr>
<tr><td>결과평가자 수</td><td colspan="2">NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>39(78%)</td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">NR</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">NR</td></tr>
</table>

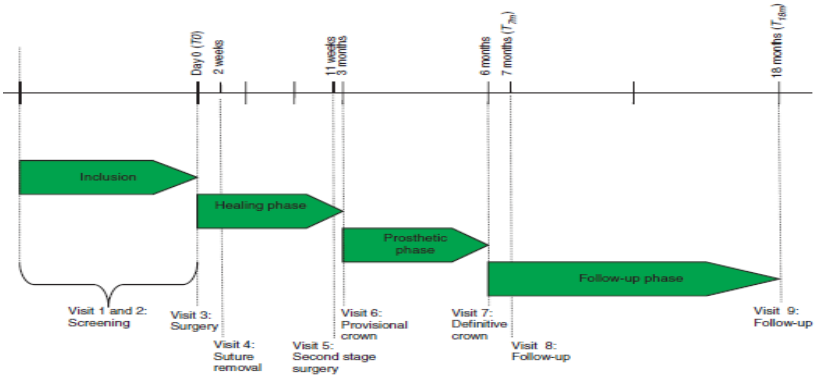
<table>
<tr><td>연번(Ref ID)</td><td colspan="2">3</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Cho (2016)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>대한민국</td></tr>
<tr><td>• 연구기관</td><td>연대세브란스 치과병원</td></tr>
<tr><td>• 연구기간</td><td>2000.3월 ~ 2010.12월</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>- teeth with post-treatment AP where orthograde retreatment and apical surgery were considered unfeasible or were declined by the patient.</td></tr>
<tr><td>• 제외기준</td><td>1. Teeth with divergent roots or with broken down coronal tooth structure were excluded because of fracture risk during extraction
2. Teeth with pre-operative periodontal defects ≥6 mm, root perforation, root resorption, developmental groove, or subcrestal root caries</td></tr>
<tr><td>• 표본수</td><td>치아 159개 (159명)</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>〈40</td><td>98</td><td>61.6</td></tr><tr><td>≥40</td><td>61</td><td>38.4</td></tr></table></td></tr>
<tr><td>• 성</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>남</td><td>47</td><td>29.6</td></tr><tr><td>여</td><td>112</td><td>70.4</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>전치(Anterior)</td><td>8</td><td>5</td></tr><tr><td>소구치(Premolar)</td><td>5</td><td>3.2</td></tr><tr><td>대구치(Molar)</td><td>146</td><td>91.8</td></tr><tr><td>상악(Maxilla)</td><td>49</td><td>30.8</td></tr><tr><td>하악(Mandible)</td><td>110</td><td>69.2</td></tr></table></td></tr>
<tr><td>• 역충전 재료</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>IRM</td><td>65</td><td>40.9</td></tr><tr><td>MTA</td><td>55</td><td>34.6</td></tr><tr><td>Super EBA</td><td>39</td><td>24.5</td></tr></table></td></tr>
<tr><td>• 구외 조작시간 (EO time)</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>≤15</td><td>67</td><td>70.5</td></tr><tr><td>>15</td><td>28</td><td>29.5</td></tr></table></td></tr>
<tr><td>중재법 및 비교치료법</td><td>• 중재법</td><td>의도적 재식술</td></tr>
<tr><td></td><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>81.12% (159/196)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균: 3.2년 최소: 6개월, 최대: 12년</td></tr>
<tr><td>결과 평가기준</td><td></td><td>NR</td></tr>
<tr><td>결과평가자 수</td><td></td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>95%</td></tr>
<tr><td>success rate</td><td></td></tr>
<tr><td>결론</td><td colspan="2">- 결론적으로 의도적 재식술 이후 12년동안 누적된 연구결과 내에서 치아 이식 및 치근단 미세 수술에 대한 현재 지침에 따르면 93 %, 3 년 이상 합병증 없는 치유율은 77 %였음
- 15분 이내에 치아를 이식했을 때 치유가 1.7배 더 자주 발생했음. 비록 대부분의 합병증이 의도적 재식술 후 1년 이내에 발생했지만, 재식술 이후 늦게 발생하는 합병증을 확인하기 위해서는 치료 후 경과관찰 기간을 3년까지로 봐야함</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">-공적지원
This study was supported by the research fund of Yonsei University, College of Dentistry (2013;6-2013-0131) and research fund of Catholic Kwandong University International St Mary's Hospital</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">4</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Jang (2016)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>대한민국</td></tr>
<tr><td>• 연구기관</td><td>연대세브란스 치과병원</td></tr>
<tr><td>• 연구기간</td><td>2002. 6월 ~ 2015. 11월</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>1. Teeth treated with nonsurgical RCT but still showing signs and symptoms of nonhealing, such as persistent pain or sinus tract
2. Teeth that could not be properly treated with apical microsurgery because of anatomic limitations, such as proximity to the mental nerve, thick buccal bone, and low accessibility for repair of the radicular groove or endodontic perforation</td></tr>
<tr><td>• 제외기준</td><td>1. Teeth in which nonsurgical RCT had failed but apical microsurgery was available
2. Teeth diagnosed as having a vertical root fracture before or during intentional replantation</td></tr>
<tr><td>• 표본수</td><td>치아 41개 (41명)</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>≤36.2</td><td>21</td><td>51.21</td></tr><tr><td>>36.2</td><td>20</td><td>48.78</td></tr></table></td></tr>
<tr><td>• 성</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>남</td><td>12</td><td>29.26</td></tr><tr><td>여</td><td>29</td><td>70.73</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>전치(Incisor)</td><td>1</td><td>2.43</td></tr><tr><td>대구치(Molar)</td><td>39</td><td>95.12</td></tr><tr><td>소구치(Premolar)</td><td>1</td><td>2.43</td></tr><tr><td>상악(Maxilla)</td><td>5</td><td>12.19</td></tr><tr><td>하악(Mandible)</td><td>36</td><td>87.80</td></tr></table></td></tr>
<tr><td>• 역충전 재료</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>ProRoot MTA</td><td>16</td><td>39.02</td></tr><tr><td>Others</td><td>25</td><td>60.97</td></tr></table></td></tr>
<tr><td>• 구외 조작시간 (EO time)</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>≤15 min</td><td>26</td><td>63.41</td></tr><tr><td>>15 min</td><td>11</td><td>26.82</td></tr></table></td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>의도적 재식술</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>100% (41/41)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균: NR 최소: 1개월 최대: 11년</td></tr>
<tr><td>결과 평가기준</td><td colspan="2">- 임상 및 방사선학적 검사기반
1.‘‘Tooth survival’’ was diagnosed when the tooth maintained normal masticatory function without any subjective discomfort, with the periapical lesion size remaining the same or decreasing in size. Slight tooth mobility (horizontal displacement of 〈2 mm), restricted root resorption, and tooth ankylosis were not regarded as treatment failure
2. ‘‘Treatment failure’’ was diagnosed when the radiographic findings showed an increase in the size of the periapical lesion or when there were any signs and/or symptoms hindering normal masticatory function, which included excessive tooth mobility (any vertical displacement or horizontal displacement of 〉2 mm) because of surrounding alveolar bone loss or inflammatory root resorption and persistent masticatory</td></tr>
</table>

		pain
결과평가자 수		NR
결과	survival rate	87.8%
	success rate	
결론		- 15 분을 초과하는 구강 외 시간과 재충전 재료로 ProRoot MTA를 사용하는 것은 의도적으로 C자형 근관을 이식 한 치아의 낮은 생존율과 관련이 있었음 - 예후 요인에 대한 이해를 바탕으로 한 개선 된 임상 절차를 통해 의도적 이식은 C자형 근관으로 치아를 치료하는데 유리한 치료 옵션이 될 것임
기타		
- 재정지원		-공적지원: Supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education

1.3 임플란트

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">1</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Meijndert (2020)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>네덜란드</td></tr>
<tr><td>• 연구기관</td><td>단일기관
– Department of Oral and Maxillofacial Surgery of the University Medical Centre Groningen (UMCG), the Netherlands.</td></tr>
<tr><td>• 연구기간</td><td>2007.10–2009.06</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>single-implant treatment in the maxillary aesthetic zone
At least 18 years of age.
One missing tooth being an incisor, canine or first premolar in the maxilla with adjacent natural teeth.
Space width with mesial-distal width of at least 6 mm.</td></tr>
<tr><td>• 제외기준</td><td>American Society of Anesthesiologists (ASA) physical status classification system score III (Smeets et al. 1998).
Presence of clinically active periodontal disease as expressed by probing pocket depths 4 mm in combination with bleeding on probing.
Presence of peri-apical lesions or any other abnormalities in the anterior region of the maxilla as detected on a radiograph.
Smoking 〈3 months before bone augmentation (if applicable) or implant placement.
Tooth extraction 〈3 months before implant placement.</td></tr>
<tr><td>• 표본수</td><td>60/60 (환자수/치아수)</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>36.9 ± 15.1 (18–71)</td></tr>
<tr><td>• 성</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>남</td><td>29</td><td>48.3</td></tr><tr><td>여</td><td>31</td><td>51.7</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td>anterior maxilla 60 (100%)<table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>전치(Anterior)</td><td>60</td><td>100</td></tr><tr><td>소구치(Premolar)</td><td>0</td><td>0</td></tr><tr><td>대구치(Molar)</td><td>0</td><td>0</td></tr><tr><td>상악(Maxilla)</td><td>60</td><td>100</td></tr><tr><td>하악(Mandible)</td><td>0</td><td>0</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>3.3 mm (n=12) Bone Level NC® and 4.1 mm (n=48) Bone Level RC® implants (Straumann Bone Level Implant System, Institute Straumann AG)</td></tr>
</table>

<table>
<tr><td></td><td>• 수술시기
(발치-수술)</td><td> 

발치-식립: 12주이내</td></tr>
<tr><td></td><td>• 보철시기
(수술-보철)</td><td>보철: 12주</td></tr>
<tr><td>보철타입</td><td></td><td>- screw: 33
- cement: 27</td></tr>
<tr><td>중재법 및
비교치료법</td><td>• 중재법</td><td>Bone-level implants with conical connections</td></tr>
<tr><td></td><td>• 비교치료법</td><td>-</td></tr>
<tr><td>추적관찰</td><td>• Recall rate</td><td>100% (60/60) - 18개월기준
83.3% (50/60) - 60개월기준</td></tr>
<tr><td></td><td>• 추적관찰기간</td><td>평균 : 60m /최소 : 18m /최대: 60m</td></tr>
<tr><td>결과 평가기준</td><td>• survival</td><td>Survival: the implant or crown was present, immobile and no progressive bone loss, infection or fracture leading to removal was reported.</td></tr>
<tr><td></td><td>• success</td><td>Bone loss(Internal), Prothesis, Soft tissue complication 기준</td></tr>
<tr><td>결과</td><td>• survival rate</td><td><table>
<tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr>
<tr><td>Implant survival</td><td>18m</td><td>60</td><td>60</td><td>100</td></tr>
<tr><td>Implant survival</td><td>60m</td><td>50</td><td>50</td><td>100</td></tr>
<tr><td>Crown survival</td><td>60m</td><td>50</td><td>50</td><td>100%</td></tr>
</table></td></tr>
<tr><td></td><td>• success rate</td><td>bone level 기준 - 98%(49/50)
모든 complication 고려 - 5y 72%(36/50)</td></tr>
<tr><td>결론</td><td></td><td>Bone-level implants with a conical connection 는 상악 심미 영역에서 단일 치아 교체에서 신뢰할 수 있는 치료 옵션임</td></tr>
<tr><td>기타</td><td></td><td></td></tr>
<tr><td>- 재정지원</td><td></td><td>사적지원
This research was supported by Institut Straumann AG with a grant.</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">2</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Asgeirsson (2019)</td></tr>
<tr><td rowspan="3">연구방법</td><td>• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>스위스</td></tr>
<tr><td>• 연구기관</td><td>단일기관
Clinic of Fixed and Removable Prosthodontics and Dental Material Science, Center of Dental Medicine, University of Zurich, Zurich, Switzerland</td></tr>
<tr><td></td><td>• 연구기간</td><td>NR</td></tr>
<tr><td rowspan="10">연구대상</td><td>• 포함기준</td><td>상악 또는 하악의 전치부위에서 단일 치아 결손으로 인해 임플란트 치료를 받은 환자 Thoma, D. S., Gamper, F. B., Sapata, V. M., Voce, G., Hammerle, C. H. F., & Sailer, I. (2017). Spectrophotometric analysis of fluorescent zirconia abutments compared to "conventional" zirconia abutments: A within subject controlled clinical trial. Clinical Implant Dentistry and Related Research, 19, 760-66. 참고</td></tr>
<tr><td>• 제외기준</td><td>Thoma, D. S., Gamper, F. B., Sapata, V. M., Voce, G., Hammerle, C. H. F., & Sailer, I. (2017). Spectrophotometric analysis of fluorescent zirconia abutments compared to "conventional" zirconia abutments: A within subject controlled clinical trial. Clinical Implant Dentistry and Related Research, 19, 760-66. 참고</td></tr>
<tr><td>• 표본수</td><td>24/24</td></tr>
<tr><td>• 표본수집방법</td><td>연속적/비연속적
(제시하지 않은 것은 NR)</td></tr>
<tr><td>• 연령</td><td>49.1 (25-72)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>24</td><td>100</td></tr><tr><td>male</td><td>13</td><td>54.2</td></tr><tr><td>female</td><td>11</td><td>45.8</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>24</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>2</td><td>8.3</td></tr><tr><td>소구치(Premolar)</td><td>22</td><td>91.7</td></tr><tr><td>대구치(Molar)</td><td>0</td><td>0</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>18</td><td>75</td></tr><tr><td>하악(Mandible)</td><td>6</td><td>25</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>Bone level; Institut Straumann AG</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>NR</td></tr>
<tr><td>보철타입</td><td></td><td>cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>91.7% (22/24)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대: 1y</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td></td><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>1y</td><td>23</td><td>24</td><td>95.8</td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">Veneered zirconia reconstructions cemented on non-original titanium bases 사용에서 PD 와 BOP 값의 유의한 증가가 관찰되었음.</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">사적지원
3M Deutschland</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">3</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Gulje (2019)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>네덜란드</td></tr>
<tr><td>• 연구기관</td><td>다기관
- private practice ‘De Mondhoek’ Apeldoorn
- University Medical Center Groningen</td></tr>
<tr><td>• 연구기간</td><td>2011.01-2012.12</td></tr>
<tr><td rowspan="6">연구대상</td><td>• 포함기준</td><td>상악동 6~8mm 뼈 높이와 최소 6mm 뼈 폭을 갖는 상악 구치부의 치아 1개가 누락된 환자
• capable of understanding and giving informed consent
• presence of antagonistic teeth
• a bone height between 6 to 8 mm beneath the maxillary sinuses and a bone width of at least 6 mm.</td></tr>
<tr><td>• 제외기준</td><td>• uncontrolled pathologic processes in the oral cavity
• known or suspected current malignancy
• history of radiation therapy in the head and neck region
• history of chemotherapy within 5 years prior to surgery
• systemic or local disease or condition that could compromise postoperative healing and/or osseointegration
• uncontrolled diabetes mellitus
• corticosteroids or any other medication that could influence postoperative healing and/or osseointegration
• smoking more than 10 cigarettes/day
• present alcohol and/or drug abuse.</td></tr>
<tr><td>• 표본수</td><td>38/41 (환자수/치아수)</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>- 49세 (29-72)
- 5년 f/u
<table><tr><td></td><td>6mm group
(21개, 20명)</td><td>11mm group
(20개, 18명)</td></tr><tr><td>Mean age
(SD, min-max)</td><td>50(10, 30-71)</td><td>48 (12, 29-72)</td></tr></table></td></tr>
<tr><td>• 성</td><td>- 남 48.8% (남 20 / 여 21)
- 5년 f/u
<table><tr><td></td><td>6mm group
(21개, 20명)</td><td>11mm group
(20개, 18명)</td><td>계</td></tr><tr><td>남</td><td>7</td><td>11</td><td>18</td></tr><tr><td>여</td><td>13</td><td>7</td><td>20</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><td></td><td>6mm group
(21개, 20명)</td><td>11mm group
(20개, 18명)</td><td>총</td></tr><tr><td>total</td><td>21</td><td>20</td><td>41</td></tr><tr><td>위치 1</td><td></td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>0</td><td>0</td><td>0</td></tr><tr><td>소구치(Premolar)</td><td>5</td><td>6</td><td>11</td></tr><tr><td>대구치(Molar)</td><td>16</td><td>14</td><td>30</td></tr><tr><td>위치 2</td><td></td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>21</td><td>20</td><td>41</td></tr><tr><td>하악(Mandible)</td><td>0</td><td>0</td><td>0</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>11-mm implant (OsseoSpeed 4.0S, Dentsply Implants, Molndal, Sweden)
6-mm implant (OsseoSpeed 4.0S)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>12 weeks</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>2 weeks</td></tr>
<tr><td>보철타입</td><td colspan="2">a titanium individual abutment (Atlantis Abutment, Dentsply Implants, Molndal, Sweden) was placed (20 Ncm torque) and a zirconia-based porcelain restoration was cemented.</td></tr>
<tr><td>중재법 및 비교치</td><td>• 중재법</td><td>6mm implant</td></tr>
</table>

<table>
<tr><td>료법</td><td>• 비교치료법</td><td>11mm implant</td></tr>
<tr><td>추적관찰</td><td>• Recall rate</td><td>12m- 97.6% (40/41)
60m- 92.7% (38/41)</td></tr>
<tr><td></td><td>• 추적관찰기간</td><td>평균 : /최소 : 12m /최대: 60m</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>• implant: present, immobile and removal was not dictated by progressive bone loss, infaction or fracture
• restoration: present, not renewed, renewal was not dictated by extensive fracture or inferior aesthetics</td></tr>
<tr><td></td><td>success</td><td>Bone loss(internal)</td></tr>
<tr><td>결과</td><td>survival rate</td><td>
<table>
<tr><td></td><td></td><td colspan="3">6mm group</td><td colspan="3">11mm group</td><td colspan="3">total</td></tr>
<tr><td></td><td>시점</td><td>event</td><td>total</td><td>%</td><td>event</td><td>total</td><td>%</td><td>event</td><td>total</td><td>%</td></tr>
<tr><td>Implant survival</td><td>60m</td><td>19</td><td>20</td><td>95.0</td><td>19</td><td>19</td><td>100</td><td>38</td><td>39</td><td>97.4</td></tr>
<tr><td>restoration survival</td><td>60m</td><td>17</td><td>19</td><td>89.4</td><td>19</td><td>19</td><td>100</td><td>36</td><td>38</td><td>94.7</td></tr>
</table>
</td></tr>
<tr><td></td><td>success rate</td><td>60m 기준 91.4%(32/35)</td></tr>
<tr><td>결론</td><td></td><td>상악의 11mm 임플란트 수술과 6mm 임플란트 수술간의 5년간의 single restoration 지지 성공률은 동일함</td></tr>
<tr><td>기타</td><td></td><td></td></tr>
<tr><td>- 재정지원</td><td></td><td>사적지원
This two-centre study has been partially sponsored by Dentsply Implants. None of the authors have economical interest in the product related in this study or in the company.</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">4</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Joda (2019)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>Randomized crossover study design</td></tr>
<tr><td>• 연구국가</td><td>스위스</td></tr>
<tr><td>• 연구기관</td><td>단일기관
Department of Reconstructive Dentistry, University Center for Dental Medicine Basel, University of Basel, Basel, Switzerland</td></tr>
<tr><td>• 연구기간</td><td>2012.03-2012.09</td></tr>
<tr><td rowspan="7">연구대상</td><td>• 포함기준</td><td>소구치 또는 대구치에 soft-tissue-level type implant system에서 초기 수복물로 시멘트형 ZrO2 또는 PFM single-unit implant crowns을 수행한 환자
General inclusion criteria were periodontalhealthy conditions, nonsmoking or 〈10 cigarettes per day; further site-specific aspects with implant placement in native bone or simultaneous minor bone augmentation procedures, existing interproximal and antagonistic contacts to neighboring teeth.</td></tr>
<tr><td>• 제외기준</td><td>-</td></tr>
<tr><td>• 표본수</td><td>20/20</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>55y (35-73)</td></tr>
<tr><td>• 성</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>남</td><td>10.6</td><td>53</td></tr><tr><td>여</td><td>9.4</td><td>47</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>n</th><th>%</th></tr><tr><td>total</td><td>20</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>0</td><td>0</td></tr><tr><td>소구치(Premolar)</td><td>7</td><td>35</td></tr><tr><td>대구치(Molar)</td><td>13</td><td>65</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>NR</td><td>NR</td></tr><tr><td>하악(Mandible)</td><td>NR</td><td>NR</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>soft-tissue-level type implant system (Straumann TL RN/WN SP-Platform, Institut Straumann AG, Basel, Switzerland)</td></tr>
<tr><td>• 수술시기 (발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기 (수술-보철)</td><td>12 weeks</td></tr>
<tr><td>보철타입</td><td colspan="2">cement-retained crowns (cemented ZrO2)
screw-retained crowns (Straumann TL Implant System)</td></tr>
<tr><td>중재법 및 비교치료법</td><td>• 중재법</td><td>CAD/CAM 처리 된 임플란트</td></tr>
<tr><td></td><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>100 % (20/20)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 60m /최소 : NR /최대: NR</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td></td><td>success</td><td>Bone loss(internal)</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival</td><td>36m</td><td>20</td><td>20</td><td>100</td></tr><tr><td>prosthetic restorations survival</td><td>36m</td><td>20</td><td>20</td><td>100</td></tr><tr><td>Implant survival</td><td>60m</td><td>19</td><td>20</td><td>95</td></tr></table></td></tr>
<tr><td>success rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>success rate</td><td>60m</td><td>19</td><td>20</td><td>95</td></tr></table></td></tr>
<tr><td>결론</td><td colspan="2">CAD/CAM 처리 된 임플란트 크라운은 기능 5년 후 유망한 방사선 및 임상 결과를 보여줌</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
</table>

	사적지원
- 재정지원	The authors would like to thank for the interdisciplinary collaboration with the Department of Oral Surgery & Stomatology and also express their gratitude to the Dental Technician Kurt Flury (Bern, Switzerland) for the production of all implant crowns in this RCT. In addition, they acknowledge Institut Straumann AG (Basel, Switzerland) for the support of the study.

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">5</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Laass (2019)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>스위스</td></tr>
<tr><td>• 연구기관</td><td>단일기관 (Clinic of Fixed and Removable Prosthodontics and Dental Material Science, University of Zurich)</td></tr>
<tr><td>• 연구기간</td><td>NR</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>the anterior area of the maxilla or the mandible
(incisors, canines, or premolars)에 임플란트를 수행한 환자
All implants were to be restored with single tooth reconstructions using customized zirconia abutments
(ATLANTIS Abutments shade 00, DENTSPLY Implants) and all-ceramic crowns (emax®, Ivoclar Vivadent, Schaan, Finland)</td></tr>
<tr><td>• 제외기준</td><td>-</td></tr>
<tr><td>• 표본수</td><td>20/20</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>baseline: 46±15
5y f/u: 53±16</td></tr>
<tr><td>• 성</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>남</td><td>13</td><td>65</td></tr><tr><td>여</td><td>7</td><td>35</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>test</th><th>control</th><th>Total</th></tr><tr><td>total</td><td>10</td><td>10</td><td>20</td></tr><tr><td>위치 1</td><td></td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>2</td><td>8</td><td>10</td></tr><tr><td>소구치(Premolar)</td><td>8</td><td>2</td><td>10</td></tr><tr><td>대구치(Molar)</td><td>0</td><td>0</td><td>0</td></tr><tr><td>위치 2</td><td></td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>7</td><td>9</td><td>16</td></tr><tr><td>하악(Mandible)</td><td>3</td><td>1</td><td>4</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>implants (OsseoSpeed, ASTRA TECH Implant System, DENTSPLY Implants, Mölndal, Sweden)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>NR</td></tr>
<tr><td>보철타입</td><td></td><td>Cement (n=20)</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Implant with white zirconia abutment with a pink veneered submucosal part</td></tr>
<tr><td>• 비교치료법</td><td>Implant with white zirconia abutment</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>3y- 90% (18/20)
5y- 80% (16/20)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 5y(60±0.6months) /최소 : /최대:</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td></td><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival</td><td>12m</td><td>20</td><td>20</td><td>100</td></tr><tr><td>restorations survival</td><td>12m</td><td>19</td><td>20</td><td>95%</td></tr><tr><td>Implant survival</td><td>36m</td><td>18</td><td>18</td><td>100</td></tr><tr><td>restorations survival</td><td>36m</td><td>18</td><td>19</td><td>95%</td></tr><tr><td>Implant survival</td><td>60m</td><td>17</td><td>17</td><td>100</td></tr><tr><td>restorations survival</td><td>60m</td><td>16</td><td>17</td><td>94.1</td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
</table>

결론	적은 샘플 수로 한계가 있기는 하지만 veneering of the submucosal part of internally connected zirconia abutments는 생물학적으로 덜 유리한 결과가 (PD,BOP,KM) 나왔지만 방사선촬영 및 기술적으로는 nonveneered abutments와 유사함.
기타	
- 재정지원	사적지원 This study was supported and funded by the Clinic of Fixed and Removable Prosthodontics and Dental Material Science, Center of Dental Medicine, University of Zurich, Switzerland. All abutments were kindly provided by DENTSPLY Implants, Mölndal, Sweden. The authors would like to thank Dr. C Lustenberger, Clinic of Fixed and Removable Prosthodontics and Dental Material Science, University of Zurich, for performing the statistical analysis. The support of Gisela Müller, study monitor at the Clinic of Fixed and Removable Prosthodontics and DentalMaterial Science, Center for Dental Medicine, University of Zurich, is highly acknowledged.

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">6</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Lang (2019)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>미국</td></tr>
<tr><td>• 연구기관</td><td>단일기관
-Case Western Reserve University School of Dental Medicine</td></tr>
<tr><td>• 연구기간</td><td>2008-2011</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>2008년~2011년 사이 predoctoral clinic에서 single-crown restoration 임플란트를 이식한 환자</td></tr>
<tr><td>• 제외기준</td><td>-</td></tr>
<tr><td>• 표본수</td><td>431/431</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>18-83세</td></tr>
<tr><td>• 성</td><td><table><tr><th>구분</th><th>N</th><th>%</th></tr><tr><td>남</td><td>220</td><td>51.0</td></tr><tr><td>여</td><td>211</td><td>49.0</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>431</td><td></td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>NR</td><td>-</td></tr><tr><td>소구치(Premolar)</td><td>NR</td><td>-</td></tr><tr><td>대구치(Molar)</td><td>NR</td><td>-</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>214</td><td>49.7</td></tr><tr><td>하악(Mandible)</td><td>217</td><td>50.3</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>Nobel Biocare Replace (Nobel Biocare)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>NR</td></tr>
<tr><td>보철타입</td><td colspan="2">cement or screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Implant</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>NA</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NA /최소 : NR /최대: NR</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td></td><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>survival (total)</td><td>4y</td><td>414</td><td>431</td><td>96.1</td></tr><tr><td>survival (Maxilla)</td><td>4y</td><td>204</td><td>214</td><td>95.3</td></tr><tr><td>survival (Mandible)</td><td>4y</td><td>210</td><td>217</td><td>96.8</td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">임플란트를 수행한 턱의 위치(상악/하악)간의 수술 또는 보철 관련 합병증 발생, 임플란트 실패, 쑬실패 등에서 통계적으로 유의한 차이는 없음</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">지원없음</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">7</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Ma (2019)</td></tr>
<tr><td rowspan="3">연구방법</td><td>• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>뉴질랜드</td></tr>
<tr><td>• 연구기관</td><td>단일기관
John Walsh Research Institute, University of Otago</td></tr>
<tr><td>• 연구기간</td><td>Brown SDK, Payne AGT. Immediately restored single implants in the aesthetic zone of the maxilla using a novel design: 1-year report. Clin Oral Implants Res. 2011;22:445-454. 참고</td></tr>
<tr><td rowspan="10">연구대상</td><td>• 포함기준</td><td>The inclusion criteria for our study required that any peri-implant gap between the coronal portion of the tooth socket and the implant shoulder measure ≤2 mm, thus the placement of biomaterials fillers was unnecessary. If the implant had been placed with sufficient primary stability, then provisional implant crowns were connected within 4 hours of implant placement and loaded according to the progressive immediate loading protocol.</td></tr>
<tr><td>• 제외기준</td><td>Any implants placed with lack of clinical stability were excluded from progressing with the immediate provisionalization.</td></tr>
<tr><td>• 표본수</td><td>27/28 (환자수/치아수)</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>mean : 47.1 range : (21-71)</td></tr>
<tr><td>• 성</td><td>남: 9, 여: 18 남성비율(33.3%)</td></tr>
<tr><td>• 치아 위치</td><td>
<table>
<tr><th></th><th>N</th><th>%</th></tr>
<tr><td>total</td><td>28</td><td>100</td></tr>
<tr><td>위치 1</td><td></td><td></td></tr>
<tr><td>전치(Anterior)</td><td>28</td><td>100</td></tr>
<tr><td>소구치(Premolar)</td><td>-</td><td>-</td></tr>
<tr><td>대구치(Molar)</td><td>-</td><td>-</td></tr>
<tr><td>위치 2</td><td></td><td></td></tr>
<tr><td>상악(Maxilla)</td><td>28</td><td>100</td></tr>
<tr><td>하악(Mandible)</td><td>-</td><td>-</td></tr>
</table>
</td></tr>
<tr><td>• 임플란트명</td><td>Southern Implants, Irene, South Africa</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>within 4 hours</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>8 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Single implant</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>5y 59.3% (16/27) (환자수)
5y 60.7% (17/28) 임플란트</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대:5y</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>5y : 100% (17/17)</td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">상악 전치의 단일 누락 치아에 대하여 12 platform tilt and zirconia abutments 의 티타늄 임플란트는 성공적인 옵션이 될 수 있음.</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">사적지원
The study has been funded by Southern Implants in terms of dental implants and material only.</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">8</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Nothdurft (2019)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>독일</td></tr>
<tr><td>• 연구기관</td><td>단일기관
(Department of Prosthetic Dentistry and Dental Materials Science, Medical Center, Dental School and Clinics, Saarland University)</td></tr>
<tr><td>• 연구기간</td><td>2005.5.-2007.9</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>prefabricated all-ceramic zirconium dioxide implant abutment for single-tooth replacement in the posterior region.
- intermediate gaps or cantilever situations in the posterior teeth of the maxilla or mandible,
- age ≥18 years
- good oral hygiene
- adequate knowledge of written and spoken German
- 참여동의</td></tr>
<tr><td>• 제외기준</td><td>- nicotine abuse (more than five cigarettes per day)
- alcohol abuse (physical dependence on alcohol to the extent that stopping alcohol use brings on withdrawal symptoms)
- irradiation in the orofacial region
- systemic or neurologic diseases (exception: controlled adult-onset diabetes); diseases regarded as contraindications for surgery
- psychologic or psychiatric reports that might influence the course of treatment or follow-up
- reduced bone volume, where additional surgery is needed;
- pregnancy
- marked bruxism</td></tr>
<tr><td>• 표본수</td><td>환자수 24, 임플란트 수 42</td></tr>
<tr><td>• 표본수집방법</td><td>연속적 (consecutive convenience sample)</td></tr>
<tr><td>• 연령</td><td>54±12 (34~74)</td></tr>
<tr><td>• 성</td><td><table><tr><th>분포</th><th>N</th><th>%</th></tr><tr><td>남</td><td>9</td><td>37.5</td></tr><tr><td>여</td><td>15</td><td>62.5</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>31</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>31</td><td>100</td></tr><tr><td>소구치(Premolar)</td><td>-</td><td>-</td></tr><tr><td>대구치(Molar)</td><td>-</td><td>-</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>6</td><td>19.4</td></tr><tr><td>하악(Mandible)</td><td>25</td><td>80.6</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>Xive S plus screw type, Dentsply Sirona Implants</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>하악 ≥3개월, 상악 ≥ 6개월</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>NR</td></tr>
<tr><td>보철타입</td><td colspan="2">screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Implant (Ceramic Zirconium Dioxide Implant Abutments)</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>5y: 91.2% (31/34)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대: 5y</td></tr>
</table>

<table>
<tr><td rowspan="3">결과 평가기준</td><td>survival</td><td colspan="4">abutment fxailures: included screw loosening and a rotational misfit.</td></tr>
<tr><td>success</td><td colspan="4">NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td></td><td>시점</td><td>event</td><td>total</td><td>%</td></tr>
<tr><td></td><td>overall survival</td><td>5y</td><td>34</td><td>39</td><td>87.2</td></tr>
<tr><td>success rate</td><td colspan="4">NR</td></tr>
<tr><td>결론</td><td colspan="4">full zirconia posterior implant abutments 를 사용한 임플란트는 5년후 기능평가 결과 적어도 이 연구에서 사용된 임플란트 시스템과는 결합해서 사용하는 것은 권장할 수 없음.</td></tr>
<tr><td>기타</td><td colspan="4"></td></tr>
<tr><td>- 재정지원</td><td colspan="4">사적지원
The author thanks Dentsply Sirona Implants and Prosthetics for their support in conducting this study. The author declares no conflicts of interest.</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">9</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Amorfini (2018)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>이탈리아</td></tr>
<tr><td>• 연구기관</td><td>다기관
Department of Prosthodontics, University of Milan and in two private practices (Milan and Gallarate, Italy)</td></tr>
<tr><td>• 연구기간</td><td>2005.07-2006.07</td></tr>
<tr><td rowspan="10">연구대상</td><td>• 포함기준</td><td>- Age > 21 y
- Absence of relevant medical disease
- Absence of periodontal disease
- One failed tooth in the anterior maxilla (second bicuspid to second bicuspid)
- Two intact adjacent teeth
- Presence of intact contralateral tooth
- Adequate bone to achieve primary stability
- Presence of facial keratinized mucosa
- FMPS, FMBS < 25%</td></tr>
<tr><td>• 제외기준</td><td>- Systemic disease that could interfere with healing
- Pregnant
- Heavy smokers (> 10 cigarettes/d)
- Contralateral tooth missing or heavily restored
- Periapical lesion > 5 mm in diameter
- Mesial or distal bone defects
- Sites with major bone reconstruction needed</td></tr>
<tr><td>• 표본수</td><td>32/32</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>ZrC(n=16): 48.3(25-76)
FCA(n=16): 47.6(24-73)</td></tr>
<tr><td>• 성</td><td>
<table>
<tr><td></td><td colspan="2">ZrC</td><td colspan="2">FCA</td><td colspan="2">Total</td></tr>
<tr><td></td><td>N</td><td>%</td><td>N</td><td>%</td><td>N</td><td>%</td></tr>
<tr><td>total</td><td>16</td><td>100</td><td>16</td><td>100</td><td>32</td><td>100</td></tr>
<tr><td>male</td><td>7</td><td>43.75</td><td>6</td><td>37.5</td><td>13</td><td>40.6</td></tr>
<tr><td>female</td><td>9</td><td>56.25</td><td>10</td><td>62.5</td><td>19</td><td>59.4</td></tr>
</table>
</td></tr>
<tr><td>• 치아 위치</td><td>
<table>
<tr><td></td><td>ZrC</td><td>FCA</td><td>Total</td></tr>
<tr><td>total</td><td>16</td><td>16</td><td>32</td></tr>
<tr><td>위치 1</td><td></td><td></td><td></td></tr>
<tr><td>전치(Anterior)</td><td>16</td><td>16</td><td>32</td></tr>
<tr><td>소구치(Premolar)</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>대구치(Molar)</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>위치 2</td><td></td><td></td><td></td></tr>
<tr><td>상악(Maxilla)</td><td>16</td><td>16</td><td>32</td></tr>
<tr><td>하악(Mandible)</td><td>-</td><td>-</td><td>-</td></tr>
</table>
</td></tr>
<tr><td>• 임플란트명</td><td>Regular Neck, Tissue Level implants (Straumann AG)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>immediate</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>식립 후 보철 시기
(loading / crown placement/ prosthesis delivery / restoration)</td></tr>
<tr><td>보철타입</td><td></td><td>cemented/ screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>ZrC group</td></tr>
<tr><td>• 비교치료법</td><td>FCA group</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>7y: 96.9% (31/32)
9y: 93.75% (30/32)
10y: 93.75 (30/32) 환자</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대:10y</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>임플란트 유지 여부</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td>결과</td><td>survival rate</td><td>10y : 100% (30/30)</td></tr>
</table>

		loss 언급 없음
	success rate	NR
결론		10년의 추적기간 동안 단일 치아 임플란트에서 customized zirconia abutments 의 성공적인 사용을 확인하였고, 더 큰 규모의 후속 연구가 필요함.
기타		
- 재정지원		지원없음 The authors report no conflicts of interest.

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">10</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Donos (2018)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>영국</td></tr>
<tr><td>• 연구기관</td><td>단일기관
- UK Dental Hospital</td></tr>
<tr><td>• 연구기간</td><td>2008-2011</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>• Age between 18 and 75 years;
• Good medical and psychological health;
• Absence of untreated caries lesions and untreated/ uncontrolled periodontal disease. If patients required periodontal treatment (non-surgical and/or surgical), this was arranged outside the study protocol and completed at least 30 days prior to the enrolment;
• Need of a single-tooth replacement in the aesthetic (incisor, canine or premolar) region;
• At least 8 weeks of post-extraction socket healing had occurred in the edentulous site;
• Willingness to sign the informed consent form.</td></tr>
<tr><td>• 제외기준</td><td>• Pregnancy and lactation;
• Any known disease (not including controlled diabetes mellitus), infections or recent surgical procedures within 30 days of study initiation;
• Chronic treatment (i.e., 2 weeks or more) with any medication known to affect oral status (e.g., phenytoin, dihydropyridine, calcium antagonists and cyclosporine) within 1 month before baseline visit;
• Anticoagulant therapy with warfarin, clopidogrel, ticlopidine or once daily aspirin (more than 81 mg);
• HIV or Hepatitis;
• Physical handicaps that would interfere with the ability to perform adequate oral hygiene;
• Alcoholism or chronic drug abuse;
• Heavy smokers (〉10/cigarettes per day);
• Patients suffering from a known psychological disorder or with limited mental capacity or language skills such that study information could not be understood, informed consent could be obtained or simple instructions could be followed;
• Full-mouth bleeding (BOP) and plaque (PI) scores 〉30% or sites with periodontal pocket depth 〉5 mm at the completion of the pretreatment phase;
• Lack of adequate primary stability at implant insertion that enables immediate provisionalisation (insertion torque ca 30 Ncm). In case the implant insertion torque was 〈30 Ncm, the patient was automatically allocated to the not immediately provisionalised group (control group).</td></tr>
<tr><td>• 표본수</td><td>24/24</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>47.1±9.8</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>24</td><td>100</td></tr><tr><td>male</td><td>7</td><td>29.2</td></tr></table></td></tr>
</table>

<table>
<tr><td></td><td></td><td><table><tr><td>female</td><td>17</td><td>70.8</td></tr></table></td></tr>
<tr><td></td><td>• 치아 위치</td><td>NR</td></tr>
<tr><td></td><td>• 임플란트명</td><td>SLActive®, Institut Straumann AG, Basel, Switzerland</td></tr>
<tr><td></td><td>• 수술시기
(발치-수술)</td><td>immediately/ 12-14 weeks</td></tr>
<tr><td></td><td>• 보철시기
(수술-보철)</td><td>16 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>screw</td></tr>
<tr><td>중재법 및 비교치료법</td><td>• 중재법</td><td>immediately provisionalised (test group)</td></tr>
<tr><td></td><td>• 비교치료법</td><td>and not immediately provisionalised (control group)</td></tr>
<tr><td>추적관찰</td><td>• Recall rate</td><td>(23/24)</td></tr>
<tr><td></td><td>• 추적관찰기간</td><td>평균 : NR /최소 : 12 months /최대: 24 months</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>survival rate of the implants
(presented as a cumulative survival rate at first and second year after implant placement)</td></tr>
<tr><td></td><td>success</td><td>NR</td></tr>
<tr><td>결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>12m</td><td>24</td><td>24</td><td>100</td></tr><tr><td></td><td>24m</td><td>23</td><td>23</td><td>100</td></tr></table></td></tr>
<tr><td></td><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td></td><td>2 년 추적 관찰에서 immediately provisionlised 임플란트는 conventionally loaded 임플란트의 결과와 유사한 방사선, 임상 및 심미적 결과를 보임</td></tr>
<tr><td>기타</td><td></td><td></td></tr>
<tr><td>- 재정지원</td><td></td><td>사적지원
- Institut Straumann AG, Basel, Switzerland</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">11</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Gluckman (2018)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>남아프리카</td></tr>
<tr><td>• 연구기관</td><td>단일기관/ database search at a private practice</td></tr>
<tr><td>• 연구기간</td><td>NR</td></tr>
<tr><td rowspan="10">연구대상</td><td>• 포함기준</td><td>private practice에서 socket-shield with immediate implant 치료를 받은 모든 환자에 관한 DB 검색을 통한 코호트 구성
• All patients who previously had socket-shield treatment
• All patients with minimum mid-term follow-up (12 months)
• Follow-up start date defined as day of restoration (provisional or definitive)
• All treatment failures (at placement, during osseointegration, during provisionalization, or post definitive restoration)
• All complications (at placement, during osseointegration, during provisionalization, or post definitive restoration)</td></tr>
<tr><td>• 제외기준</td><td>• Implants not loaded by a restoration (provisional or definitive) 〉12 months
• unable to return for follow-up evaluation despite 〉12 months elapsed post-restoration</td></tr>
<tr><td>• 표본수</td><td>128/128</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>39세 (24-71)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>128</td><td>100</td></tr><tr><td>male</td><td>70</td><td>54.7</td></tr><tr><td>female</td><td>58</td><td>45.3</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>128</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>82</td><td>64</td></tr><tr><td>canines</td><td>18</td><td>14</td></tr><tr><td>소구치(Premolar)</td><td>28</td><td>22</td></tr><tr><td>대구치(Molar)</td><td>-</td><td>-</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>115</td><td>89.9</td></tr><tr><td>하악(Mandible)</td><td>13</td><td>10.1</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>Any-Ridge, MegaGen; Ankylos, Dentsply; NobelReplace, Nobel Biocare</td></tr>
<tr><td>• 수술시기 (발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기 (수술-보철)</td><td>NR</td></tr>
<tr><td>보철타입</td><td></td><td>screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>socket-shield cases 임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>NA</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : 1y /최대: 4y</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>1y</td><td>123</td><td>128</td><td>96.1</td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td></td><td>socket-shield가 기존의 즉각적인 임플란트 식립과 지연된 식립 모두와 비교했을 때 임플란트 생존율에서 경쟁력을 보여줌</td></tr>
<tr><td>기타</td><td></td><td></td></tr>
<tr><td>- 재정지원</td><td></td><td>NR</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">12</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Joda (2018)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>스위스</td></tr>
<tr><td>• 연구기관</td><td>단일기관
Department of Reconstructive Dentistry, University Center for Dental Medicine Basel, University of Basel, Basel, Switzerland</td></tr>
<tr><td>• 연구기간</td><td>2014.04-2015.03</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>Joda & Bragger, 2016b 참고</td></tr>
<tr><td>• 제외기준</td><td>Joda & Bragger, 2016b 참고</td></tr>
<tr><td>• 표본수</td><td>20/20</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>55.4 years</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>20</td><td>100</td></tr><tr><td>male</td><td>5</td><td>25</td></tr><tr><td>female</td><td>15</td><td>75</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>20</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>0</td><td>0</td></tr><tr><td>소구치(Premolar)</td><td>7</td><td>35</td></tr><tr><td>대구치(Molar)</td><td>13</td><td>65</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>NR</td><td>-</td></tr><tr><td>하악(Mandible)</td><td>NR</td><td>-</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>Tissue Level Implant TL, Institut Straumann AG, Basel, Switzerland</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>NR</td></tr>
<tr><td>보철타입</td><td colspan="2">screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Implant of complete digital workflows</td></tr>
<tr><td>• 비교치료법</td><td>Implant of combined analogital workflows</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>3y: 100% (20/20)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대: 3y</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td></td><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>3y</td><td>20</td><td>20</td><td>100</td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">완전한 디지털 및 결합된 아날로그-디지털 워크 플로우로 처리 된 후방 임플란트 크라운에 대한 주관적인 환자의 인식 (PROM)은 3 년 후 기능, 심미성 및 세척성을 포함한 전반적인 치료 결과에 대해 비슷한 수준의 만족도를 나타냄</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">공적지원
International Team for Implantology (ITI), Grant/Award Number: ITI_897/2013</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">13</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Mangano (2018)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>이탈리아</td></tr>
<tr><td>• 연구기관</td><td>단일기관 dental center (Gravedona, Como, Italy)</td></tr>
<tr><td>• 연구기간</td><td>2014.09-2016.09</td></tr>
<tr><td rowspan="10">연구대상</td><td>• 포함기준</td><td>상악/하악에 posterior 위치에 single Morse taper connection implan 수술을 받은 환자
A further inclusion criterion was the diameter and height of the implant received: the patients had to be installed with a fixture of a minimumdiameter of 4.1mmand a height of at least 8 mm. In order to be enrolled in the study, patients had to have dentition in the opposite jaw and therefore occlusal contacts</td></tr>
<tr><td>• 제외기준</td><td>All patientswho received a single implant with a diameter of less than 4.1 mm and a height of less than 8 mm were automatically excluded from this study, as were all patients who had undergone preimplant regenerative bone therapies or who had been treated with guided bone regeneration and membranes for the presence of peri-implant defects. Additional exclusion criteria included systemic diseases such as uncompensated diabetes, immunocompromised states, head and neck tumors, and osteoporosis treated with aminobisphosphonates (administered orally and / or parenterally). Active periodontal infections and oral mucosa pathologies also represented exclusion criteria for enrollment in the present study.</td></tr>
<tr><td>• 표본수</td><td>50/50</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>52.6 ± 13.4 (24-76)</td></tr>
<tr><td>• 성</td><td><table><tr><td></td><td>N</td><td>%</td></tr><tr><td>total</td><td>50</td><td>100</td></tr><tr><td>male</td><td>22</td><td>44</td></tr><tr><td>female</td><td>28</td><td>56</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><td></td><td>N</td><td>%</td></tr><tr><td>total</td><td>50</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>0</td><td></td></tr><tr><td>소구치(Premolar)</td><td>22</td><td>44</td></tr><tr><td>대구치(Molar)</td><td>28</td><td>56</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>15</td><td>30</td></tr><tr><td>하악(Mandible)</td><td>35</td><td>70</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>Morse taper connection implant (Exacone, Leone Implants, Sesto Fiorentino, Italy)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>8 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>amonolithic zirconia crown, fabricated with digital workflow (test group)</td></tr>
<tr><td>• 비교치료법</td><td>a metal-ceramic crown, fabricated with analog workflow (control group)</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>NA</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대: NR</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><td></td><td>시점</td><td>event</td><td>total</td><td>%</td></tr><tr><td>implant survival</td><td>1y</td><td>50</td><td>50</td><td>100</td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td></td><td>digital and analog procedures 간에 임상적/ 방사선학적 차이는 없음. 그러나 디지털 절차를 active treatment time과 비용을 감소시켜 환자의 선호도가 높음</td></tr>
<tr><td>기타</td><td></td><td></td></tr>
<tr><td>- 재정지원</td><td></td><td>지원없음</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">14</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Mangano (2018)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>이탈리아</td></tr>
<tr><td>• 연구기관</td><td>다기관
a single private practice (Gravedona, Como, Italy)
the Oral Surgery Unit of the University of Insubria (Varese, Italy)</td></tr>
<tr><td>• 연구기간</td><td>2002.01-2012.12</td></tr>
<tr><td rowspan="10">연구대상</td><td>• 포함기준</td><td>Morse-taper connection implants (Leone Implants, Florence, Italy)를 사용한 환자</td></tr>
<tr><td>• 제외기준</td><td>presence of severe systemic diseases or immunocompromised status, uncompensated diabetes, bisphosphonates or antitumoral treatments, and alcohol and drug abuse. The use of pre- and peri-implant regenerative bone therapies, however, was not a criterion of exclusion for purposes of the present study.</td></tr>
<tr><td>• 표본수</td><td>578/612 (환자수/ 임플란트)</td></tr>
<tr><td>• 표본수집방법</td><td>NA</td></tr>
<tr><td>• 연령</td><td>mean: 57.2±14.7 (18-92)<table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>578</td><td>100</td></tr><tr><td>〈40 years</td><td>115</td><td>19.9</td></tr><tr><td>40-65 years</td><td>279</td><td>48.3</td></tr><tr><td>〉65 years</td><td>184</td><td>31.8</td></tr></table></td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>578</td><td>100</td></tr><tr><td>male</td><td>280</td><td>48.4</td></tr><tr><td>female</td><td>298</td><td>51.6</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>612</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>159</td><td>26.0</td></tr><tr><td>소구치(Premolar)</td><td>191</td><td>31.2</td></tr><tr><td>대구치(Molar)</td><td>262</td><td>42.8</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>295</td><td>48.2</td></tr><tr><td>하악(Mandible)</td><td>317</td><td>51.8</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>Morse-taper connection implants (Leone Implants, Florence, Italy)</td></tr>
<tr><td>• 수술시기 (발치-수술)</td><td>12-16 주</td></tr>
<tr><td>• 보철시기 (수술-보철)</td><td>12주</td></tr>
<tr><td>보철타입</td><td></td><td>cemented</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Implant</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>NA</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대: 15y</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>Implant Survival. One implant was considered to have ‘‘survived’’ if it was still functioning regularly at the last clinical and radiographic control. An implant was, conversely, considered to have ‘‘failed’’ in all cases in which the clinician was forced to remove the fixture, or in case of: lack of osseointegration of the fixture with mobility, in the absence of infection; severe and/or recurrent infection (peri-implantitis) coincident with severe, intractable bone loss; progressive bone loss in the absence of infection, but with implant mobilization; and fracture of the implant body. The failures could be defined as ‘‘early’’ if they were certified at</td></tr>
</table>

		the time of implant uncovering, before the abutment positioning and functionalization of the fixture with the provisional crown; they were defined as **"late"** if they occurred after placement of the prosthetic abutment and functionalization of the implant with the provisional crown.
	success	Implant-crown success. A single implant-supported crown was considered successful if no biologic or prosthetic complication had occurred throughout the follow-up period; conversely, if even a single complication occurred, the restoration was classified as a failure.
결과	survival rate	5y : 97% (580/x598) In total, among the surviving implant-supported crowns, only 23 complications occurred: 14 (14/23: 60.9%) were biologic and 9 (9/23: 39.1%) were prosthetic. Among the biologic complications, 8 peri-implantitis and 6 progressive peri-implant bone resorption without any clinical sign of infection were reported; therefore, the incidence of biologic complications was rather low, with 14 events registered over a total of 594 surviving crowns (14/594: 2.3%).
	success rate	NR
결론		Morse-taper connection implants는 15년간 높은 CISR (94.8%), 매우 낮은 합병증 발생률, 높은 CICSR(94.5%)로 장지적으로 단일 치아 틈을 복구하기 위한 치료임
기타		
- 재정지원		지원없음 The authors report no conflicts of interest.

연번(Ref ID)	15	
1저자(출판연도)	Naenni (2018)	
연구방법	• 연구설계	RCT
	• 연구국가	스위스
	• 연구기관	다기관 - 2개 (Periodontology and prosthodontics at the University of Zurich)
	• 연구기간	2008.03-2010.11
연구대상	• 포함기준	상악/하악의 후치부의 단일 치아 결손이 있는 18세 이상의 성인 〉18 y of age and able to comply with study procedures be healthy regarding their periodontal status (no probing depths 〉5 mm) and systemic status A single-tooth gap had to be present in the posterior segment (premolar or molar region) in the upper or lower jaw Extractions had to be performed at least 6 mo before implant placement and antagonists (teeth or implant) had to be present. A minimum amount of keratinized gingiva of 2 mm and a sufficient vertical amount of bone (6 mm in the maxilla, 10 mm in the mandible) had to be present at the future implant site. Internal sinus floor augmentation (Summers technique) could be performed if needed, but no lateral bone augmentation was allowed.
	• 제외기준	general contraindications against surgical interventions smoking 〉19 cigarettes per day (Lang and Tonetti 2003) insufficient oral hygiene inadequate compliance to the study procedures; prior therapeutic radiation of the jaw, severe bruxism, or clenching habits; any mucosal disease; preceding lateral bone augmentation with radio-opaque filler materials
	• 표본수	96/96
	• 표본수집방법	NR
	• 연령	58.2 ± 12.8 y (recall 시점)
	• 성	**N** / **%** **total** 86 100 **male** 39 45.3 female 47 54.7
	• 치아 위치	**N** / **%** **total** 86 100 **위치 1** 전치(Anterior) - 0 소구치(Premolar) 42 48.8 대구치(Molar) 44 51.2 **위치 2** 상악(Maxilla) 34 39.5 하악(Mandible) 52 60.5
	• 임플란트명	SLActive (Institute Straumann AG)
	• 수술시기 (발치-수술)	최소 24주
	• 보철시기 (수술-보철)	10주
보철타입		screw
중재법 및 비교치료법	• 중재법	6mm Implant
	• 비교치료법	10mm Implant
추적관찰	• Recall rate	85.4% (82/96)

	• 추적관찰기간	평균 : 5.1 ± 0.7 y /최소 : NR /최대:NR
결과 평가기준	survival	임플란트 유지 여부에 따라 구분
	success	NR
결과	survival rate	5y : 95.3%(82/86)
	success rate	NR
결론		비록 5년 생존율의 차이가 작게 있음에도 표준 길이의 임플란트에 대한 합리적인 대안으로 6mm 단일 임플란트를 사용할만함.
기타		
- 재정지원		사적지원 The clinical trial was supported by an ITI (International Team for Implantology) grant (Grant-Nr. 517-2007).

연번(Ref ID)	16	
1저자(출판연도)	Raes (2018)	
연구방법	• 연구설계	전향적 코호트 연구
	• 연구국가	벨기에
	• 연구기관	단일기관 - Ghent Univeristy Hospital
	• 연구기간	NR
연구대상	• 포함기준	anterior maxilla (second premolar to second premolar) 의 단일 치아 대체가 필요한 환자 - aged at least 18 years - at least 20 teeth and good oral hygiene, reflected by a full plaque score ≤ 25%. - Inclusion was only final when appropriate bone volume, allowing conventional implant placement without bone or soft tissue grafting, was confirmed by standard radiographs or computed tomography scans. - availability of bone, initial implant stability determined by a minimum insertion torque of 25 Ncm, and for extraction sockets, the presence of an intact buccal bone wall
	• 제외기준	pregnancy, uncontrolled diabetes mellitus, smoking habits, untreated caries, or periodontal disease. When bone or soft tissue regeneration was needed to enhance implant stability or esthetics, patients were excluded. If implant placement was not possible, patients were excluded.
	• 표본수	39/39
	• 표본수집방법	연속적
	• 연령	IIT 45(22-68)y CIT 40(19-75)y
	• 성	<table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>39</td><td>100</td></tr><tr><td>male</td><td>22</td><td>45.3</td></tr><tr><td>female</td><td>17</td><td>54.7</td></tr></table>
	• 치아 위치	<table><tr><td>total</td><td>39</td></tr><tr><td>위치 1</td><td></td></tr><tr><td>전치(Anterior)</td><td>39</td></tr><tr><td>소구치(Premolar)</td><td>0</td></tr><tr><td>대구치(Molar)</td><td>0</td></tr><tr><td>위치 2</td><td></td></tr><tr><td>상악(Maxilla)</td><td>39</td></tr><tr><td>하악(Mandible)</td><td>0</td></tr></table>
	• 임플란트명	titanium implant (Astra Tech Implant System, OsseoSpeed, Dentsply Sirona Implants)
	• 수술시기 (발치-수술)	immediately/conventioal
	• 보철시기 (수술-보철)	10주
보철타입		cemented/screw
중재법 및 비교치료법	• 중재법	immediate implant
	• 비교치료법	conventional implant
추적관찰	• Recall rate	8y: 75.0%(30/40)
	• 추적관찰기간	평균 :NR /최소 : 1y /최대:10y
결과 평가기준	survival	임플란트 유지 여부에 따라 구분
	success	-
결과	survival rate	<table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>implant survival</td><td>10y</td><td>29</td><td>30</td><td>96.6</td></tr></table>
	success rate	-
결론		extraction sockets and healed ridges 에서 Immediately restored 단일 임플

	란트는 생존률, 뼈 안정성, 임플란트 주변 건강 측면에서 장기간 좋은 결과를 보임. 그러나 시멘트 잔유물과 같은 원인의임플란트 주위염증을 포함하여 생물학적 및 기술적 합병증이 흔하게 발생함
기타	
- 재정지원	사적지원 This study was supported by departmental funds and by Dentsply Sirona Implants, Molndal, Sweden. Prof De Bruyn has on behalf of the university a research and educational collaboration agreement with Dentsply Sirona Implants. The authors reported no other conflicts of interest related to this study.

연번(Ref ID)	17	
1저자(출판연도)	Raes (2018)	
연구방법	• 연구설계	전향적 환자군 연구
	• 연구국가	이탈리아
	• 연구기관	다기관 six clinical centers were involved in the present study, including two university centers and four private dental clinics
	• 연구기간	2012.02-2013.02
연구대상	• 포함기준	• patients ≥18 years of age • patients with good general and oral health • patients with single tooth gaps • patients with one or more irreparably compromised single tooth/teeth to be extracted and replaced with a dental implant • sufficient alveolar bone to insert an implant with a minimum length of 10.0 mm and a minimum diameter of 3.5 mm • patients able to understand and sign an informed consent form for implant treatment
	• 제외기준	• patients with poor general health conditions (diabetic patients with poor glycemic control, severely immunocompromised patients, patients undergoing chemotherapy or radiotherapy for head and neck malignancies, patients treated with oral or parenteral aminobisphosphonates, patients with psychological or psychiatric disorders, patients with alcohol or drug addiction) • patients with poor oral health conditions (patients with chronic periodontal disease with advanced bone loss, with active dental infections with pain, pus, fistula, and patients with oral pathologies) • patients who needed to undergo major bone regeneration procedures before being able to receive dental implants (Minor regenerative procedures with granules of biomaterials such as coverage of exposed implant threads or protection/filling of vestibular and interproximal gaps were not criteria of exclusion for the present study.) • patients who exhibited damage of the buccal bone wall of the extraction socket, following the extraction of a compromised tooth • patients who did not have teeth in the opposing arch (and therefore did not have occlusal contacts) • patients with parafunctions such as bruxism or clenching (The diagnosis of parafunction was carried out after anamnesis, objective examination and electromyography.)
	• 표본수	46/57
	• 표본수집방법	NR
	• 연령	mean 44.5 (18-73) **N** / **%** **total** 46 100 16-25 7 15.2 26-35 6 13.0 36-45 7 15.2 46-55 13 28.2 56-65 9 19.5 〉65 4 8.7
	• 성	**N** / **%** **total** 46 100 male 23 50 female 23 50
	• 치아 위치	**total** 57 100.0 **위치 1** 전치(Anterior) 12 21.1 소구치(Premolar) 31 54.4 대구치(Molar) 14 24.6 **위치 2** 상악(Maxilla) 38 66.7 하악(Mandible) 19 33.3

<table>
<tr><td></td><td>• 임플란트명</td><td>Anyridge®, Megagen Corporation, Gyeongbuk, South Korea</td></tr>
<tr><td></td><td>• 수술시기
(발치-수술)</td><td>immediate</td></tr>
<tr><td></td><td>• 보철시기
(수술-보철)</td><td>12 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>screwed or cemented</td></tr>
<tr><td>중재법 및 비교치료법</td><td>• 중재법</td><td>Implant (screw-retained and cemented implant-supported zirconia single crowns)</td></tr>
<tr><td></td><td>• 비교치료법</td><td>NA</td></tr>
<tr><td>추적관찰</td><td>• Recall rate</td><td>환자수 89.1% (41/46), 임플란트 수 91.2%(52/57) (at 2 year)</td></tr>
<tr><td></td><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대: 4y</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>Implant survival: The stability of each fixture was checked by applying a reverse torque of 20 Ncm. The stability was checked three times: at delivery of provisional and final crowns, and after 4 years of load-ing.</td></tr>
<tr><td></td><td>success</td><td>NR</td></tr>
<tr><td>결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>total</td><td>4y</td><td>51</td><td>52</td><td>98.1</td></tr></table></td></tr>
<tr><td></td><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td></td><td>단일 임플란트를 즉시 로딩하는 것은 매우 성공적인 치료방법이나, 추가로 장기 데이터 확인이 필요함.</td></tr>
<tr><td>기타</td><td></td><td></td></tr>
<tr><td>- 재정지원</td><td></td><td>지원없음</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">18</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Rodriguez (2018)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>미국</td></tr>
<tr><td>• 연구기관</td><td>단일기관/ Private Practice, Beverly Hills, California</td></tr>
<tr><td>• 연구기간</td><td>NR</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>the zirconia implants were one-piece or two-piece placed in 12 consecutively treated patients</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>12/24</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>55 (27-86)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>12</td><td>100</td></tr><tr><td>male</td><td>5</td><td>41.7</td></tr><tr><td>female</td><td>7</td><td>58.3</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>24</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>9</td><td>37.5</td></tr><tr><td>posterior</td><td>15</td><td>62.5</td></tr><tr><td>소구치(Premolar)</td><td></td><td></td></tr><tr><td>대구치(Molar)</td><td></td><td></td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>20</td><td>83.3</td></tr><tr><td>하악(Mandible)</td><td>4</td><td>16.7</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>the zirconia implants were one-piece or two-piece (Z systems, Zirkolith, SLM Surface, Oensingen, Switzerland)</td></tr>
<tr><td>• 수술시기 (발치-수술)</td><td>immediate or native bone, bone-grafted sites</td></tr>
<tr><td>• 보철시기 (수술-보철)</td><td>immediate or delayed by 3 months</td></tr>
<tr><td>보철타입</td><td></td><td>cemented</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>NR</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 25m /최소 : 12m /최대: 62m</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>NR</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>The overall success rate</td><td>1-5y</td><td>22</td><td>24</td><td>91.7</td></tr></table>Two implants in two patients failed</td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td></td><td>지르코니아 임플란트는 안정적인 임상 결과와 심미적 결과를 제공하는 임플란트 치과의 임상 실습에서 옵션으로 부상하고 있음.</td></tr>
<tr><td>기타</td><td></td><td></td></tr>
<tr><td>- 재정지원</td><td></td><td>지원없음
- The authors do not have any financial interest in the companies or products used in this study.</td></tr>
</table>

연번(Ref ID)	19	
1저자(출판연도)	Velasco-Ortega (2018)	
연구방법	• 연구설계	전향적 환자군 연구
	• 연구국가	스페인
	• 연구기관	단일기관 Master's in Oral Implantology of the School of Dentistry in Seville, Spain
	• 연구기간	2011.01-2015.12
연구대상	• 포함기준	발치후 보철물로 대체가 필요한 환자 healthy patients with good oral hygiene, without chronic sys\-temic diseases, and with only a single gap after tooth loss.
	• 제외기준	the presence of chronic systemic disease, smoking ≥ 10 cigarettes/day, bruxism, uncontrolled diabetes or periodontal disease, coagula\-tion disorders, and alcohol or drug abuse.
	• 표본수	56/113
	• 표본수집방법	연속적
	• 연령	48.7세 (33-63)
	• 성	<table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>56</td><td>100</td></tr><tr><td>male</td><td>28</td><td>50</td></tr><tr><td>female</td><td>28</td><td>50</td></tr></table>
	• 치아 위치	<table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>113</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>74</td><td>65.4</td></tr><tr><td>소구치(Premolar)</td><td>42</td><td>34.6</td></tr><tr><td>대구치(Molar)</td><td>-</td><td></td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>88</td><td>77.8</td></tr><tr><td>하악(Mandible)</td><td>28</td><td>22.2</td></tr></table>
	• 임플란트명	IPX® screw implants (Galimp\-lant®, Sarria, Spain)
	• 수술시기 (발치-수술)	immediate
	• 보철시기 (수술-보철)	12 weeks
보철타입		screw
중재법 및 비교치료법	• 중재법	Implant
	• 비교치료법	NR
추적관찰	• Recall rate	100.0% (116/116)
	• 추적관찰기간	평균: NR /최소 : NR /최대: 4y
결과 평가기준	survival	The criteria used to assess survival rates were implant stability and the absence of radiolucency around the im\-plants, mucosal suppuration, and pain.
	success	문헌에서 제시한 기준 작성
결과	survival rate	<table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>implant survival</td><td>4y</td><td>113</td><td>116</td><td>97.4</td></tr></table>
	success rate	NR
결론		발치 후 즉시 삽입되는 치과 임플란트는 성공적인 치료임
기타		
- 재정지원		지원없음 The authors have declared that no conflict of interest exist.

연번(Ref ID)	20	
1저자(출판연도)	Abudo (2017)	
연구방법	• 연구설계	RCT
	• 연구국가	호주
	• 연구기관	단일기관 Royal Dental Hospital of Melbourne
	• 연구기간	NR
연구대상	• 포함기준	≧18 years, ≧20 teeth, single implant restoration(s), physically fit and able to tolerate implant surgical and restorative procedures
	• 제외기준	uncontrolled diabetes, head and neck radiation, severe parafunction, metabolic bone diseases, pregnancy, active caries or periodontal disease, major bone grafting, or smoking habit
	• 표본수	44/47
	• 표본수집방법	NR
	• 연령	NR
	• 성	NR
	• 치아 위치	NR
	• 임플란트명	3i Biomet implants (OSSEOTITE Implant, Biomet 3i, Palm Beach Gardens, Fla
	• 수술시기 (발치-수술)	식립시기: 주(week) 단위로 기술 (fixture installment/ First stage surgery) - 1개월=4주로 계산 - 식립시기(immediate/ early/ late)로만 제시된 경우 그대로 기술 - 개월 및 식립시기 같이 있는 경우 같이 기술 - 발치 후 3개월 있다가 식립하고, second surgery가 1주 있었다고 해도 이는 반영하지 않고 3개월로만 기술 ※ Second surgery - 일차 수술후에 fixture를 덮어두었다가 보철을 위해 절개하는 것. 본 수술의 기간 반영 안함
	• 보철시기 (수술-보철)	12 weeks
보철타입		screw
중재법 및 비교치료법	• 중재법	Encode protocol
	• 비교치료법	Conventional protocol
추적관찰	• Recall rate	1y 환자기준 - 90.9 % (40/44) 1y 치아기준 - 87.2 % (41/47)
	• 추적관찰기간	평균 : NR /최소 : NR /최대: 1y
결과 평가기준	survival	임플란트 유지 여부에 따라 구분
	success	NR
결과	survival rate	1y :97.6% (40/41) crown 1y :100% (41/41) implant One of the loose crowns was managed by gasket addition and retightening of the cross-pin. The other crown did not improve by the gasket addition, and the abutment design lacked the retentive features. As a result, this crown had to be remade.
	success rate	NR
결론		1년후 Conventional 방법과 비교했을 때 Encode 방법의 단일 임플란트 복구방법은 생물학적, 보철 및 심미적인 광점에서 유사함
기타		
- 재정지원		사적지원 This study has been supported by Biomet 3i. The authors acknowledge the assistance provided by the staff of the Royal Dental Hospital of Melbourne and Studio Dental Laboratory. The authors would also like to thank Ms Karen Escobar and Mr Geoff Adams for their generous contribution in data analysis.

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">21</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Bomicke (2017)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>독일</td></tr>
<tr><td>• 연구기관</td><td>단일기관
- Department of Prosthetic Dentistry at the University Hospital of Heidelberg, Germany</td></tr>
<tr><td>• 연구기간</td><td>2006.10-2010.10</td></tr>
<tr><td rowspan="10">연구대상</td><td>• 포함기준</td><td>하악 후치 부위에 단일 치아 임플란트를 받을 환자
Healthy, non-smoking individuals with a minimum bone height of 12 mm (quantified from pre-operative radiographs) and bone width of 6 mm (quantified by clinical bone sounding) at the implant site, enabling implant placement without grafting, were regarded as eligible, and were included after signing informed consent forms.</td></tr>
<tr><td>• 제외기준</td><td>under 18, limited legal capacity, pregnancy, breast feeding, drug abuse, poor oral health, bruxism, untreated periodontal disease, missing antagonist, intraoperative need for bone grafting, insertion torque less than 35 Ncm, and total width of attached gingiva less than 4 mm at the implant site</td></tr>
<tr><td>• 표본수</td><td>환자수 38/ 치아수 38</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>OPI: 54.37 ± 14.62 (21.40-69.54)
TPI: 51.51 ± 14.96 (30.39-76.26)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>OPI</th><th>TPI</th><th>Total</th></tr><tr><td>total</td><td>19</td><td>19</td><td>38</td></tr><tr><td>male</td><td>7</td><td>9</td><td>16</td></tr><tr><td>female</td><td>12</td><td>10</td><td>22</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>OPI</th><th>TPI</th><th>Total</th></tr><tr><td>total</td><td>19</td><td>19</td><td>38</td></tr><tr><td>위치 1</td><td></td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>0</td><td>0</td><td>0</td></tr><tr><td>소구치(Premolar)</td><td>1</td><td>2</td><td>3</td></tr><tr><td>대구치(Molar)</td><td>18</td><td>17</td><td>35</td></tr><tr><td>위치 2</td><td></td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>0</td><td>0</td><td>0</td></tr><tr><td>하악(Mandible)</td><td>19</td><td>19</td><td>39</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>OPI (NobelDirect Groovy, Nobel Biocare)
TPI (NobelReplace Tapered Groovy, Nobel Biocare)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>6 weeks 이내
OPI: immediate
TPI: conventional</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>OPI: 12 weeks
TPI: 12 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>screw/cemented</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>OPI (NobelDirect Groovy, Nobel Biocare)</td></tr>
<tr><td>• 비교치료법</td><td>TPI (NobelReplace Tapered Groovy, Nobel Biocare)</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>3y-92.1%(35/38)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 3y /최소 : NR /최대: 3y</td></tr>
<tr><td>결과 평가기준</td><td colspan="2">survival</td><td>Implant failure: when an implant was found to be mobile (manually tested with two fingers at impression taking, at occlusal loading, 3, 6, and 9 months, and 1, 2 and 3 years thereafter) or had to be removed because of advanced peri-implant infection or mechanical problems (e.g.</td></tr>
</table>

<table>
<tr><td></td><td></td><td>implant fracture)</td></tr>
<tr><td></td><td>success</td><td>NR</td></tr>
<tr><td rowspan="3">결과</td><td>survival rate</td><td>
<table>
<tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr>
<tr><td>implant survival</td><td>3y</td><td>34</td><td>35</td><td>97.1</td></tr>
<tr><td>- OPI</td><td>3y</td><td>18</td><td>19</td><td>94.7</td></tr>
<tr><td>- TPI</td><td>3y</td><td>16</td><td>16</td><td>100</td></tr>
</table>

one participant in the OPI group lost the study implant ; it was found to be mobile before receiving a definitive crown.</td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td></td><td>두 임플란트 절차 모두 단기간에 실행 가능할 수 있지만 통계적으로 훨씬 더 많은 골손실이 OPI에서 나타날 수 있음. chipping 발생률이 높기 때문에 veneered zirconia crown은 후방 임플란트에 권장할 수 없음</td></tr>
<tr><td>기타</td><td></td><td></td></tr>
<tr><td>- 재정지원</td><td></td><td>사적지원
The authors are grateful to Nobel Biocare for providing the study materials free of charge. Money received from the manufacturer was used to reimburse participants for regular attendance at follow-up appointments and to finance data management. The authors declare no conflict of interest.</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">22</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Cacaci (2017)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td></td></tr>
<tr><td>• 연구기관</td><td>다기관
two dental offices in Munich</td></tr>
<tr><td>• 연구기간</td><td>2008.03-2013.11</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>Inclusion criteria were in need of at least one implant-supported single crown, adult (≥18 years), good oral hygiene (API 〈 10 %, SBI 〈 10 %), non-smokers or moderate smokers (less than five cigarettes per day), no TMD problems according to the RDC criteria [39, 40], and no contraindications for surgery. After gathering detailed preimplant medical history (general as well as specific) from all patients, individual surgical implant planning was made based upon a panoramic radiograph and dental model analysis following a standardized protocol.</td></tr>
<tr><td>• 제외기준</td><td>-</td></tr>
<tr><td>• 표본수</td><td>58/114</td></tr>
<tr><td>• 표본수집방법</td><td>연속적/비연속적
(제시하지 않은 것은 NR)</td></tr>
<tr><td>• 연령</td><td>NR</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>58</td><td>100</td></tr><tr><td>male</td><td>22</td><td>37.9</td></tr><tr><td>female</td><td>36</td><td>62.1</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><td></td></tr><tr><td>total</td></tr><tr><td>위치 1</td></tr><tr><td>전치(Anterior)</td></tr><tr><td>소구치(Premolar)</td></tr><tr><td>대구치(Molar)</td></tr><tr><td>위치 2</td></tr><tr><td>상악(Maxilla)</td></tr><tr><td>하악(Mandible)</td></tr></table>NR</td></tr>
<tr><td>• 임플란트명</td><td>implants (Camlog Promote/Promote Plus; Conelog, Wimsheim, Germany)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>16 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>cemented or screw</td></tr>
<tr><td>중재법 및 비교치료법</td><td>• 중재법</td><td>screw-retained</td></tr>
<tr><td></td><td>• 비교치료법</td><td>cemented</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>86.2 % (50/58)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대: 3y</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td></td><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>3y : 100% 114/114</td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">sintered veneering capdl 있는 zirconia crowns 임플란트는 우수한 성능을 보여줌. retention유형은 technical complications에 영향을 미치지 않음</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">지원없음
The work was not funded.</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">23</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Cucchi (2017)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>이탈리아</td></tr>
<tr><td>• 연구기관</td><td>다기관
six different Clinical Centers (two university centers and four dental private practices).</td></tr>
<tr><td>• 연구기간</td><td>2013.01-2015.12</td></tr>
<tr><td rowspan="6">연구대상</td><td>• 포함기준</td><td>상악/하악의 소구치 또는 대구치에 있어서 단일 치아의 발치가 필요한 환자
(a) one or more nonrestorable single teeth that had to be extracted and replaced with an implant supported single crown in the posterior maxilla and mandible (only premolar and molar regions); (b) adequate bone volume to place an implant at least 3.7mm in diameter and 10mm in length, without bone augmentation procedures; (c) naturally occluding dentition in the opposing jaw; (d) comprehension, acceptance, and full compliance for the treatment and followup study protocol.</td></tr>
<tr><td>• 제외기준</td><td>(a) available bone length 〈10mmand bone width 〈 4.5 mm; (b) untreated and/or active periodontitis; (c) poor oral hygiene and motivation (full mouth plaque index (FMPI) 〉 20%; full mouth bleeding index (FMBI) 〉 20%); (d) heavy smoking habit (〉20 cigarettes/day); (e) general contraindication to implant surgery, such as uncontrolled systemic diseases, immunosuppression, and HIV/HCV/HBV infection; (f) chemotherapy and/or irradiation in the head and neck area; (g) treatment with amino-bisphosphonates; (h) pregnancy or nursing; (i) inability to complete the follow-up.</td></tr>
<tr><td>• 표본수</td><td>92/97</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td><table><tr><th></th><th>Test</th><th>Control</th><th>Total</th></tr><tr><td>total</td><td>48</td><td>44</td><td>92</td></tr><tr><td>20-39</td><td>12</td><td>10</td><td>22</td></tr><tr><td>20-59</td><td>31</td><td>14</td><td>45</td></tr><tr><td>60-79</td><td>5</td><td>20</td><td>25</td></tr></table>51.0 ± 9.5 (20-79)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>Test</th><th>Control</th><th>Total</th></tr><tr><td>total</td><td>48</td><td>44</td><td>92</td></tr><tr><td>male</td><td>21</td><td>22</td><td>43</td></tr><tr><td>female</td><td>27</td><td>22</td><td>39</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>Test</th><th>Control</th><th>Total</th></tr><tr><td>total</td><td>49</td><td>48</td><td>97</td></tr><tr><td>위치 1</td><td></td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>-</td><td>-</td><td>-</td></tr><tr><td>소구치(Premolar)</td><td>25</td><td>30</td><td>55</td></tr><tr><td>대구치(Molar)</td><td>24</td><td>18</td><td>42</td></tr><tr><td>위치 2</td><td></td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>25</td><td>18</td><td>43</td></tr><tr><td>하악(Mandible)</td><td>24</td><td>30</td><td>54</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>BT Safe Bone Level; Biotec BTK, Dueville, Vicenza, Italy</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>TG: immediate(49)
CG: 12-16 weeks (48)</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>12 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Implant immediate</td></tr>
<tr><td>• 비교치료법</td><td>Implant after 12-169 weeks</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>% (결과관찰시점 대상자/enroll 대상자) 명으로 제시</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 24.4 ± 9.3 months /최소 : 1y /최대: 3y</td></tr>
</table>

결과 평가기준	survival	임플란트 유지 여부에 따라 구분 Survival of the Implants. Implant survival was considered a primary outcome of this study. All the implants that were regularly in function and under load at the last clinical and radiographic follow-up control (1 or 3 years after placement, resp.) were considered “survivors.” Conversely, all implants that were not osseointegrated after the first healing period were found clinically mobile at second-stage surgery and were therefore removed and considered “failed”; similarly, al implants that suffered for recurrent and intractable acute infection (peri-implantitis) with massive bone loss and clinical mobility and that had to be consequently removed were considered “failed.” Finally, implants were considered “failed” in case of fracture of the fixture body.
	success	NR
결과	survival rate	3y : 97.9% (95/97) During the followup period, no implant was lost, so these favourable outcomes were confirmed.
	success rate	NR
결론		TG와 CG사이의 1차 안정성 수준에서 유의한 차이가 발견되었지만, fresh extraction sockets and healed sites의 단일 임플란트의 생존률과 합병증 발생률을 유사하였음. Crestal bone levels and peri-implant bone resorpxtion은 유사하였음. 이러한 결과를 확인하기 이ㅜ해서는 더 장기간의 연구가 필요함
기타		
- 재정지원		지원없음 The authors do not have any conflicts of interest related to the present randomized controlled trial.

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">24</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Ekfeldt (2017)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>스웨덴</td></tr>
<tr><td>• 연구기관</td><td>NR</td></tr>
<tr><td>• 연구기간</td><td>2004.03-2008.03</td></tr>
<tr><td rowspan="9">연구대상</td><td>• 포함기준</td><td>zirconia abutments를 이용한 단일 임플란트 수복을 받은 환자
- tooth gap with healthy non-restored neighbour teeth for which a conventional fixed dental prosthesis was not adequate
- Patients who were found suitable and accepted the invitation</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>23명/30개</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>median 30 (27-63)</td></tr>
<tr><td>• 성</td><td>NR</td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>31</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>29</td><td>93.5</td></tr><tr><td>소구치(Premolar)</td><td>1</td><td>3.25</td></tr><tr><td>대구치(Molar)</td><td>1</td><td>3.25</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>26</td><td>83.9</td></tr><tr><td>하악(Mandible)</td><td>5</td><td>16.1</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>Nobel Biocare (Nobel Biocare AB, Gothenburg, Sweden: 24 Branemark Mk III; 7 Replace Select)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>Sixty implants(32%) : a one-stage procedure using a healing abutment a healing period from 2.5 to 9 months (median 4months).
For the other 125 implants (68%) : a two-stage procedure healing period of 2-12 months (median 4months)</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>NR</td></tr>
<tr><td>보철타입</td><td></td><td>cemented or screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트 (External)</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>31명(≥10 years) : one had lost the implant restoration.
76.7% (23명/31명 accepted the invitation)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : 10y /최대: 11y</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>NR</td></tr>
<tr><td>success</td><td>Bone loss(External), Prothesis, Soft tissue complication 기준</td></tr>
<tr><td rowspan="3">결과</td><td>survival rate</td><td>10y 96.7%(29/30)</td></tr>
<tr><td>success rate</td><td>bone loss 기준
<table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Changes (mm) 0~ - 2.4 (ref 2.8mm)</td><td>10y</td><td>30</td><td>30</td><td>100</td></tr></table>
모든 complication 고려 - 56.7%(17/30)</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>결론</td><td colspan="2">단일 임플란트 크라운을 위한 Zirconia abutments는 10-11년동안 우수한 기술적 및 생물학적 결과를 보여주었고, 대부분의 환자는 심미적 및 기능적인 측면에서 만족하였음.</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">공적지원
-This study has been supported by grants from Praktikertj€anst AB, Stockholm, Sweden.</td></tr>
</table>

연번(Ref ID)	25	
1저자(출판연도)	Esposito (2017)	
연구방법	• 연구설계	RCT
	• 연구국가	이탈리아
	• 연구기관	다기관 - single experienced operator (Dr Pietro Felice) in the Dental Clinic of the University of Bologna and three private dental clinics, two located in Bologna and one in Conselice, Italy,
	• 연구기간	2012.01-2014.12
연구대상	• 포함기준	발치 후 즉시 임플란트가 한 개 이상 필요한 환자 being at least 18 years old and able to sign an informed consent form was eligible for inclusion. Sites were required to have sufficient bone to allow the placement of a single implant at least 8.5 mm long with a minimal diameter of 3.5 mm
	• 제외기준	• general contraindications to implant surgery; • immunosuppressed or immunocompromised; • irradiation in the head or neck area; • uncontrolled diabetes; • pregnancy or lactation; • untreated periodontitis; • poor oral hygiene and motivation; • addiction to alcohol or drugs; • psychiatric disorders; • acute infection (abscess) in the site intended for implant placement; • necessity to lift the maxillary sinus epithelium; • unable to commit to 5-year follow-up postloading; • under treatment or had previous treatment with intravenous amino-bisphosphonates; • participation in other studies interfering with present protocol.
	• 표본수	환자수 210/ 치아수 210
	• 표본수집방법	연속적

• 연령

	Immediate	Immediate-delayed	Delayed	Total
total	55.3 ± 11.0 (34-79)	53.5 ± 13.4 (29-76)	55.8 ± 11.6 (34-75)	NR

• 성

	Immediate	Immediate-delayed	Delayed	Total
total	**70**	**70**	**70**	**210**
male	**34**	**36**	37	107
female	36	34	33	103

• 치아 위치

	Immediate	Immediate -delayed	Delayed	Total
total	**70**	**70**	**70**	**210**
위치 1				
전치(Anterior)	15	12	4	31
canine	8	10	11	29
소구치(Premolar)	26	17	24	67
대구치(Molar)	21	31	31	83
위치 2				
상악(Maxilla)	21	40	55	126
하악(Mandible)	49	30	15	94

	• 임플란트명	NobelActive implants (Nobel Biocare, Goteborg, Sweden)

<table>
<tr><td></td><td>• 수술시기
(발치-수술)</td><td>immediate
immediate-delayed : 6 weeks
delayed: 24 weeks</td></tr>
<tr><td></td><td>• 보철시기
(수술-보철)</td><td>16 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>screw</td></tr>
<tr><td>중재법 및 비교치료법</td><td>• 중재법</td><td>immediate</td></tr>
<tr><td></td><td>• 비교치료법</td><td>immediate-delayed delayed</td></tr>
<tr><td>추적관찰</td><td>• Recall rate</td><td>93.3 % (196/210)</td></tr>
<tr><td></td><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대:1y</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>Implant failure: implant failure was defined as implant mobility and/or any infection dictating implant removal or any mechanical failure rendering the implant unusable, such as implant fracture or deformation of the implant-abutment connection. The stability of each implant was measured manually by tightening the abutment screw at the abutment connection and definitive crown delivery with a 20 Ncm torque.
Crown failure: cases where it was not possible to place the crown due to implant failures or secondary to implant losses, or replacement of the definitive crown for any reasons.</td></tr>
<tr><td></td><td>success</td><td></td></tr>
<tr><td>결과</td><td>survival rate</td><td>• Implant failures: 9 implants failed – 4 from the immediate group, 4 from the immediate-delayed group and 1 from the delayed group (Table 3). There were no statistically significant differences in implant failures between the three procedures (P (chi-square test) = 0.369). All failed implants were successfully replaced, but data of the replaced implants were not recorded since they fell outside the scope of the present study.
Table 3 Implant failures up to 1 year post-loading in chronological order, by study group and related treatment
<table>
<tr><td colspan="4">Immediate implants</td></tr>
<tr><td>Pat #</td><td>Time*</td><td>Implant/tooth #; symptoms</td><td>Treatment and outcome</td></tr>
<tr><td>#203</td><td>6 m.p-i</td><td>#46; implant mobile at surgical exposure</td><td>Successfully replaced</td></tr>
<tr><td>#17</td><td>3 m.p-l</td><td>#45; 2 months after loading, slight pain on chewing, no mobility or radiographic signs, implant removed from occlusion for 1 month, pain still present</td><td>Successfully replaced</td></tr>
<tr><td>#98</td><td>4 m.p-l</td><td>#26; 3 months after loading slight pain on chewing, no mobility or radiographic signs, implant removed from occlusion for 1 month, pain still present</td><td>Successfully replaced</td></tr>
<tr><td>#109</td><td>3 m.p-l</td><td>#24; slight pain on chewing, implant mobile</td><td>Successfully replaced</td></tr>
<tr><td colspan="4">Immediate-delayed implants</td></tr>
<tr><td>#86</td><td>6 m.p-i</td><td>#36; implant mobile at surgical exposure</td><td>Successfully replaced</td></tr>
<tr><td>#16</td><td>9 m.p-i</td><td>#46; implant mobile at surgical exposure</td><td>Successfully replaced</td></tr>
<tr><td>#78</td><td>3 m.p-l</td><td>#22; 2 months after loading slight pain on chewing, no mobility or radiographic signs, implant removed from occlusion for 1 month, pain still present</td><td>Successfully replaced</td></tr>
<tr><td>#154</td><td>3 m.p-l</td><td>#36; 2 months after loading slight pain on chewing, no mobility or radiographic signs, implant removed from occlusion for 1 month, pain still present</td><td>Successfully replaced</td></tr>
<tr><td colspan="4">Delayed implants</td></tr>
<tr><td>#54</td><td>6 m.p-i</td><td>#16; implant mobile at surgical exposure</td><td>Successfully replaced</td></tr>
</table>
Legends: m.p-i = month post-implantation; m.p-l = month post-loading; *Failure time = when the implant was actually removed.
1y : 95%(187/196)</td></tr>
<tr><td></td><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td></td><td>발치 후 immediately, 6 weeks or 4 months 이후 단일 임플란트를 식립 할 때 실패, 합병증 및 환자 만족도에 대한 통계적으로 유의 한 차이가 관찰되지 않았으나, 즉시 및 즉시 지연된 임플란트에서 실패가 더 자주 발생함. 뼈 수준의 변화는 다른 시술 사이에서 유사했지만, 심미성은 immediate and immediate delayed</td></tr>
</table>

	implants 에서 더 나은 결과를 얻었음.
기타	
- 재정지원	사적지원 This trial was partially funded by Nobel Biocare Services (code: 2010-894), the manufacturer of the implants evaluated in this investigation; however, data belonged to the authors and by no means did the manufacturer interfere with the conduct of the trial or the publication of the results

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">26</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Ganeles (2017)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>전향적 코호트 연구</td></tr>
<tr><td>• 연구국가</td><td>미국</td></tr>
<tr><td>• 연구기관</td><td>단일기관
Rinn extension cone paralleling holder (Dentsply),</td></tr>
<tr><td>• 연구기간</td><td>NR</td></tr>
<tr><td rowspan="10">연구대상</td><td>• 포함기준</td><td>The patient inclusion criteria were as follows: ≥ 18 years old, in need of immediate implant placement with a fixed provisional restoration between the first maxillary bicuspids, had natural teeth adjacent to the implant site, had sufficient bone volume and density to receive ≥ 3.5-mm-diameter, 10-mm-length implants without grafting, had an extraction socket with at least three intact walls and free of tooth remnants, had an implant site that met immediate temporization criteria, was healthy with no treatment precluding uncontrolled systemic diseases, smoked ≤ 10 cigarettes per day, had a stable occlusal relationship with no severe bruxism, and was available for the 2-year investigation period.</td></tr>
<tr><td>• 제외기준</td><td>Exclusion criteria were as follows: unable to give informed consent; had a record or history of alcohol or drug abuse; had a health condition that contraindicated the surgical procedure; was at risk for negative overall health effects (psychiatric problems) following treatment; needed bone augmentation prior to implant placement (minor augmentation procedures were permitted, such as covering exposed threads or interproximal/buccal grafting with materials that have similar radiopacity to native bone); had previous tumors, chronic bone disease, or previous irradiation; had ongoing infections or uncontrolled endodontic/periodontal problems at adjacent teeth; had a current or previous history of high-dose intravenous bisphosphonate administration for metastatic diseases; or had an uncontrolled metabolic disease. Patients were also excluded if the final implant torque was 〈 35 Ncm</td></tr>
<tr><td>• 표본수</td><td>15/15 (환자수/ 임플란트수)</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>68.33 ± 14.5</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>15</td><td>100</td></tr><tr><td>male</td><td>9</td><td>60</td></tr><tr><td>female</td><td>6</td><td>40</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>15</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>11</td><td>73.3</td></tr><tr><td>소구치(Premolar)</td><td>4</td><td>26.7</td></tr><tr><td>대구치(Molar)</td><td>0</td><td>0</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>15</td><td>100</td></tr><tr><td>하악(Mandible)</td><td>0</td><td>0</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>implants (NobelActive, Nobel Biocare)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>immediate</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>6 month</td></tr>
<tr><td>보철타입</td><td></td><td>cement- or screw-retained</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Implant</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>1y 86.7% (13/15)
2y 73.3% (11/15)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대: 2y</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td>success</td><td>NR</td></tr>
</table>

<table>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table>
<tr><td></td><td>시점</td><td>event</td><td>total</td><td>%</td></tr>
<tr><td rowspan="2">Implant survival</td><td>1y</td><td>13</td><td>13</td><td>100%</td></tr>
<tr><td>2y</td><td>11</td><td>11</td><td>100%</td></tr>
</table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">전반적으로 연구에 임플란트는 우수한 경조직, 연조직 및 심미적 결과를 보였으며, 이는 상악 심미 영역의 단일 치아 발치 부위에서 건강한 조직반응을 나타냄.</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">사적지원
This study was supported by Nobel Biocare Services AG (grant number 2009-847).</td></tr>
</table>

연번(Ref ID)	27	
1저자(출판연도)	Hartog (2017)	
연구방법	• 연구설계	RCT
	• 연구국가	네덜란드
	• 연구기관	단일기관 department of Oral and Maxillofacial Surgery of the University Medical Center Groningen, University of Groningen, Groningen, The Netherlands
	• 연구기간	NR
연구대상	• 포함기준	전방 단일 임플란트 치료가 필요한 환자 • at least 18 years of age; • one missing tooth being an incisor, canine or first premolar in the • maxilla with adjacent natural teeth; adequate oral hygiene, that is, modified plaque index score and modified sulcus bleeding index score〈=1; • mesial-distal width of interdental space at least 6 mm.
	• 제외기준	• ASA score〉=III • presence of active clinical periodontal disease as expressed by probing pocket depths 4 mm and bleeding on probing • presence of peri-apical lesions or any other abnormalities in the maxillary anterior region as determined on a radiograph; • smoking; • a history of radiotherapy to the head and neck region.
	• 표본수	93/93
	• 표본수집방법	연속적/비연속적 (제시하지 않은 것은 NR)
	• 연령	<table><tr><td></td><td>Smooth group</td><td>Rough group</td><td>Scalloped group</td><td>Total</td></tr><tr><td>total</td><td>37.2±12.9 (18-60)</td><td>40.1±14.4 (18-67)</td><td>40.1±17.2 (19-80)</td><td>NR</td></tr></table>
	• 성	<table><tr><td></td><td>Smooth group</td><td>Rough group</td><td>Scalloped group</td><td>Total</td></tr><tr><td>total</td><td>31</td><td>31</td><td>31</td><td>93</td></tr><tr><td>male</td><td>15</td><td>17</td><td>14</td><td>46</td></tr><tr><td>female</td><td>16</td><td>14</td><td>17</td><td>47</td></tr></table>
	• 치아 위치	<table><tr><td></td><td>Smooth group</td><td>Rough group</td><td>Scalloped group</td><td>Total</td></tr><tr><td>total</td><td>31</td><td>31</td><td>31</td><td>93</td></tr><tr><td>위치 1</td><td></td><td></td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td></td><td></td><td></td><td></td></tr><tr><td>소구치(Premolar)</td><td></td><td></td><td></td><td></td></tr><tr><td>대구치(Molar)</td><td></td><td></td><td></td><td></td></tr><tr><td>위치 2</td><td></td><td></td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td></td><td></td><td></td><td></td></tr><tr><td>하악(Mandible)</td><td></td><td></td><td></td><td></td></tr><tr><td>위치 3</td><td></td><td></td><td></td><td></td></tr><tr><td>I1</td><td>20</td><td>18</td><td>18</td><td>46</td></tr><tr><td>I2</td><td>7</td><td>8</td><td>6</td><td>21</td></tr><tr><td>C</td><td>1</td><td>3</td><td>3</td><td>7</td></tr><tr><td>P</td><td>3</td><td>2</td><td>4</td><td>9</td></tr></table>
	• 임플란트명	• a 1.5 mm smooth (“machined”) implant neck (Replace Select Tapered, Nobel Biocare AB, G€oteborg, Sweden)—“smooth”group; • a rough implant neck with grooves (NobelReplace Tapered Groovy, Nobel Biocare AB)—“rough”group; • a scalloped rough implant neck with grooves (NobelPerfect Groovy, Nobel Biocare AB)—“scalloped”group.
	• 수술시기 (발치-수술)	12 weeks
	• 보철시기 (수술-보철)	24 weeks
보철타입		screw- or cement-

중재법 및 비교치료법	• 중재법	• scalloped group.
	• 비교치료법	• rough group • smooth group
추적관찰	• Recall rate	89.2 (83/93)%
	• 추적관찰기간	평균 : NR /최소 : NR /최대: NR
결과 평가기준	survival	임플란트 유지 여부에 따라 구분
	success	Bone loss(Internal), Prothesis, Soft tissue complication 기준
결과	survival rate	5y 97.6%(80/82)
	success rate	bone loss - 90%(72/80) 모든 complication - 83.8%(67/80)
결론		전방 단일 치아 교체로, scalloped 임플란트는 smooth neck or rough neck과 비교하였을 때 방사선 및 임상 결과가 덜 유리함
기타		
- 재정지원		사적지원 Nobel Biocare AB, G€oteborg, Sweden, Grant/Award Number: 2004-288

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">28</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Hsu (2017)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>중국</td></tr>
<tr><td>• 연구기관</td><td>단일기관
Department of Periodontology, Linkou Medical Center, Chang Gung Memorial Hospital, Taoyuan, Taiwan</td></tr>
<tr><td>• 연구기간</td><td>2009.01-2012.12</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>The inclusion criterion was a posterior edentulous area restored with single implants on which compatible CAD-CAM TiAs and cement-retained crowns were installed as superstructures</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>102/117 (환자수/ 임플란트)</td></tr>
<tr><td>• 표본수집방법</td><td>연속적/비연속적
(제시하지 않은 것은 NR)</td></tr>
<tr><td>• 연령</td><td>47.5 ±12.1 years (22.2 - 74.5)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>102</td><td>100</td></tr><tr><td>male</td><td>49</td><td>48</td></tr><tr><td>female</td><td>53</td><td>52</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td>NR</td></tr>
<tr><td>• 임플란트명</td><td>Straumann implants (Straumann Institute)
XiVE implants (Dentsply Intl)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>3-6 month</td></tr>
<tr><td>보철타입</td><td colspan="2">cement-</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>79.4% (81/102) (환자수)
80.2% (94/117) (임플란트)</td></tr>
<tr><td>• 추적관찰기간</td><td>NA</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival</td><td>-</td><td>94</td><td>94</td><td>100</td></tr><tr><td>prosthesis survival</td><td>-</td><td>94</td><td>94</td><td>100</td></tr></table>1y : 100%
None encountered abutment or crown failure
loss 언급없음</td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">호환 가능한 CAD-CAM TiA는 PSITR에 대한 실행 가능한 치료 옵션을 제공함. 그러나 상대적으로 높은 나사 풀림 및 치사율을 고려할 때, 적절한 cements and abutment 제조업체를 선택하는 것이 치료 옵션의 임상 성능을 향상시키는 데 필수적임</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">NR</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">29</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Joda (2017)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>전향적 코호트 연구</td></tr>
<tr><td>• 연구국가</td><td>NR</td></tr>
<tr><td>• 연구기관</td><td>NR</td></tr>
<tr><td>• 연구기간</td><td>NR</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>NR</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>20/20</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>55세</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>20</td><td>100</td></tr><tr><td>male</td><td>NR</td><td>53</td></tr><tr><td>female</td><td>NR</td><td>47</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td>NR</td></tr>
<tr><td>• 임플란트명</td><td>implants (Institut Straumann AG, Basel, Switzerland)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>Joda, T. & Bragger, U. (2015a) Digital vs. conventional implant prosthetic workflows: a cost/time analysis. Clinical Oral Implants Research 26: 1430-1435.
Joda, T. & Bragger, U. (2015b) Time-efficiency analysis comparing digital and conventional workflows for implant crowns: a prospective clinical crossover trial. International Journal of Oral & Maxillofacial Implants 30: 1047-1053.
참고</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>Joda, T. & Bragger, U. (2015a) Digital vs. conventional implant prosthetic workflows: a cost/time analysis. Clinical Oral Implants Research 26: 1430-1435.
Joda, T. & Bragger, U. (2015b) Time-efficiency analysis comparing digital and conventional workflows for implant crowns: a prospective clinical crossover trial. International Journal of Oral & Maxillofacial Implants 30: 1047-1053.
참고</td></tr>
<tr><td>보철타입</td><td colspan="2">cemented/screwed</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>NR</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 36.2±3.1 months (range: 30-43) /최소 : NR /최대: NR</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>NR</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival</td><td>-</td><td>20</td><td>20</td><td>100</td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">임상 시험의 결과는 임플란트 성공을 평가하는 객관적이고 신뢰할 수있는 도구로서 FIPS의 잠재력을 제시함. FIPS는 환자가 인지한 만족스러운 결과를 검증하고 가능한 실패 위험을 식별하며 후속 관찰을 비교하는 지원 도구가 될 수 있음.</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">사적지원
The authors thank the dental laboratory Flury + Sieber GmbH, Bern, Switzerland, for production of all implant-supported singleunit crowns. The authors also acknowledge Institut Straumann AG, Basel, Switzerland, for financial and material support of the study (IIS-08/12).</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">30</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Mangano (2017)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>이탈리아</td></tr>
<tr><td>• 연구기관</td><td>다기관
six different dental centers</td></tr>
<tr><td>• 연구기간</td><td>2012.02-2013.02</td></tr>
<tr><td rowspan="9">연구대상</td><td>• 포함기준</td><td>단일 치아 임플란트가 필요한 환자
patients with single-tooth gaps or with a single, compromised, nonrecoverable dental element to be replaced with an implant; enough bone to place an implant of at least 10.0 mm in length and 3.5 mm in diameter; aged ≥ 18 years; good general and oral health; ability to sign an informed consent; and willingness to participate in annual checkups.</td></tr>
<tr><td>• 제외기준</td><td>chronic periodontitis with advanced loss of bone support;
26 oral diseases; need for major regenerative techniques before implant placement (minor procedures including covering exposed implant threads with granulate or buccal grafting and interproximal procedures were not exclusion criteria); active infections in the tooth to be extracted (eg, pain, pus, fistula); severe impairment/damage to one of the four walls of the alveolus following extraction; lack of occlusal contacts in the antagonist arch; parafunction (ie, bruxism/clenching); uncontrolled diabetes; immunocompromised states; chemotherapy; radiotherapy; treatment with intravenous amino-bisphosphonates; psychiatric disorders; and abuse of drugs/alcohol.</td></tr>
<tr><td>• 표본수</td><td>46/57</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>mean : 44.5 years range : 18-73
<table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>46</td><td>100</td></tr><tr><td>16-25</td><td>7</td><td>15.2</td></tr><tr><td>26-35</td><td>6</td><td>13.0</td></tr><tr><td>36-45</td><td>7</td><td>15.2</td></tr><tr><td>46-55</td><td>13</td><td>29.2</td></tr><tr><td>56-65</td><td>9</td><td>19.5</td></tr><tr><td>〉65</td><td>4</td><td>8.7</td></tr></table></td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>46</td><td>100</td></tr><tr><td>male</td><td>23</td><td>50</td></tr><tr><td>female</td><td>23</td><td>50</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>57</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>9</td><td>15.8</td></tr><tr><td>Canines</td><td>3</td><td>5.2</td></tr><tr><td>소구치(Premolar)</td><td>31</td><td>54.4</td></tr><tr><td>대구치(Molar)</td><td>14</td><td>24.6</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>38</td><td>66.7</td></tr><tr><td>하악(Mandible)</td><td>19</td><td>33.3</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>implant (AnyRidge, Megagen)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>10개 - Immediate
47개 - NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>NR</td></tr>
<tr><td>보철타입</td><td></td><td>screwed or cemented</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td>추적관찰</td><td>• Recall rate</td><td>환자기준: 91.3 % (42/46)</td></tr>
</table>

		치아기준: 93.0 % (53/57)
	• 추적관찰기간	평균 : NR /최소 :NR /최대:NR
결과 평가기준	survival	임플란트 유지 여부에 따라 구분
	success	NR
결과	survival rate	2y : 98.1% (52/53) implant 2y : 98.1% (52/53) crown
	success rate	NR
결론		단일 임플란트의 즉각적인 기능적 로딩은 안전하고 성공적인 절차를 나타냄. 향후 대규모 환자를 대상으로 한 장기 추적 연구를 통해 결과를 확인하는 것 필요
기타		
- 재정지원		NR

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">31</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Meijndert (2017)</td></tr>
<tr><td rowspan="3">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>네덜란드</td></tr>
<tr><td>• 연구기관</td><td>다기관
Department of Oral and Maxillofacial Surgery in Groningen (University Medical Center Groningen, Groningen, the Netherlands) and from the Department of Oral and Maxillofacial Surgery in Drachten (Nij Smellinghe Hospital, Drachten, the Netherlands).</td></tr>
<tr><td></td><td>• 연구기간</td><td>NR</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>Meijndert et al. (2007, 2008) 참고</td></tr>
<tr><td>• 제외기준</td><td>Meijndert, L., Meijer, H.JA., Stellingsma, K., Stegenga, B. & Raghoebar, G.M. (2007) Evaluation of aesthetics of implant-supported single-tooth replacements using different bone augmentation procedures: a prospective randomized clinical study. Clinical Oral Implants Research 18: 715-719.
Meijndert, L., Raghoebar, G.M., Meijer, H.J.A. & Vissink, A. (2008) Clinical and radiographic characteristics of single-tooth replacements preceded by local ridge augmentation: a prospective randomized clinical trial. Clinical Oral Implants Research 19: 1295-1303.참고</td></tr>
<tr><td>• 표본수</td><td>환자수/치아수는 최초 enroll 대상자</td></tr>
<tr><td>• 표본수집방법</td><td>연속적/비연속적
(제시하지 않은 것은 NR)</td></tr>
<tr><td>• 연령</td><td>33.3±13.0 years (18-63)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>93</td><td>100</td></tr><tr><td>male</td><td>44</td><td>47.3</td></tr><tr><td>female</td><td>49</td><td>52.7</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>93</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>93</td><td>100</td></tr><tr><td>소구치(Premolar)</td><td>0</td><td>0</td></tr><tr><td>대구치(Molar)</td><td>0</td><td>0</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>93</td><td>100</td></tr><tr><td>하악(Mandible)</td><td>0</td><td>0</td></tr><tr><td>I1</td><td>62</td><td>66.7</td></tr><tr><td>I2</td><td>24</td><td>25.8</td></tr><tr><td>C</td><td>2</td><td>2.2</td></tr><tr><td>P</td><td>5</td><td>5.4</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>(RN synOctapost; Institute Straumann AG</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>12week or 24 weeks</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>24 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>augmentation with chin bone를 이용한 임플란트</td></tr>
<tr><td>• 비교치료법</td><td>augmentation with chin bone plus a membrane and augmentation with a bone substitute plus a membrane를 이용한 임플란트</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>10y-81.7% (76/93)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대:10y</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>NR</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>10y 94.7%(72/76)</td></tr>
<tr><td>success rate</td><td>NR</td></tr>
</table>

결론	bone augmentation techniques 에 따른 차이는 없었고, 모두 10년 후 임상적, 방사선적, 심미적, 환자중심결과측면에서 양호하였음.
기타	
- 재정지원	공적지원 The study was financed by the University Medical Center Groningen

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">32</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Schepke_2017</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>네덜란드</td></tr>
<tr><td>• 연구기관</td><td>단일기관 the University Medical Center Groningen, the Netherlands</td></tr>
<tr><td>• 연구기간</td><td>2013.01-2014.02</td></tr>
<tr><td rowspan="9">연구대상</td><td>• 포함기준</td><td>상악 또는 하악의 소구치 결손 환자
• Missing first or second premolar in the maxilla or mandible
• Wish to replace the missing premolar with an implant
• Willing to sign for informed consent
• Bone height 10 mm beneath the maxillary sinus and 10 mm above the mandibular nerve and a bone width of at least 6 mm</td></tr>
<tr><td>• 제외기준</td><td>• Missing teeth mesial or distal from implantation site
• Orthodontic treatment at the time of impression taking
• Severe bruxism
• Acute periodontitis
• History of implant loss
• Documented extreme gagging reflex
• Poor medical condition (ASA* score 3 or higher)
• Previous therapeutic radiation of the head-eck region
• Chronic pain in orofacial system
• Younger than 18 years at time of inclusion
• Reduced mental capacity</td></tr>
<tr><td>• 표본수</td><td>50/50</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>48.3 (18-79)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>50</td><td>100</td></tr><tr><td>male</td><td>17</td><td>34</td></tr><tr><td>female</td><td>33</td><td>66</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>50</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>0</td><td>0</td></tr><tr><td>소구치(Premolar)</td><td>50</td><td>100</td></tr><tr><td>대구치(Molar)</td><td>0</td><td>0</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>41</td><td>82</td></tr><tr><td>하악(Mandible)</td><td>9</td><td>18</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>AstraTech OsseoSpeed TX 3.5S in 9, 11, or 13 mm in length and a diameter of 3.5 mm; DentsplySirona Implants, M€olndal, Sweden</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>12 weeks</td></tr>
<tr><td>보철타입</td><td colspan="2">screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>CAD/CAM Customized Zirconia Implant Abutments</td></tr>
<tr><td>• 비교치료법</td><td>Stock</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>100% (50/50)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균: 12m /최소 : NR /최대: 12m</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>implants were lost</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td>결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant</td><td>1y</td><td>50</td><td>50</td><td>100</td></tr></table></td></tr>
</table>

success rate	NR
결론	소구치의 단일 치아 교체에서 CAD / CAM 맞춤형 지르코니아 어 버트먼트를 사용하는 것은 스톡 지르코니아 어 버트먼트 사용과 비교할 때 임상 성능 또는 환자 만족도 향상과 관련이 없음
기타	
- 재정지원	사적지원 This study was supported by a grant from DentsplySirona Implants, M€olndal, Sweden and by the authors'institutions. Materials were provided by DentsplySirona Implants and 3M.

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">33</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Tey (2017)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>싱가포르</td></tr>
<tr><td>• 연구기관</td><td>단일기관 National Dental Centre, Singapore</td></tr>
<tr><td>• 연구기간</td><td>2006-2010</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>• A minimum of 21 years of age
• Treatment including at least one implant supported single crown
• Medically fit patients
✓ ASA classification 1 or 2
✓ Of sound mind and able to comprehend the instructions, questionnaire and informed consent
✓ Not be suffering from any infectious diseases</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>194/266</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>Median 57 (24-80)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>194</td><td>100</td></tr><tr><td>male</td><td>93</td><td>47.9</td></tr><tr><td>female</td><td>101</td><td>52.1</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>266</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>38</td><td>14.3</td></tr><tr><td>소구치(Premolar)</td><td></td><td></td></tr><tr><td>대구치(Molar)</td><td></td><td></td></tr><tr><td>posterior</td><td>228</td><td>85.7</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>133</td><td>50</td></tr><tr><td>하악(Mandible)</td><td>133</td><td>50</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>Straumann implants, Nobel Biocareimplants, Biomet 3i</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>NR</td></tr>
<tr><td>보철타입</td><td></td><td>cemented or screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>NA</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대: 5y</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>Surviving implants were those implants still in situ at the time of examination irrespective of the condition, while failures were those that had been removed or required removal at the time of examination.</td></tr>
<tr><td>success</td><td>Successful implants or prostheses were free of any complications.</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>implant survival rate</td><td>5y</td><td>266</td><td>266</td><td>100</td></tr></table>Implants that had been removed or required removal 0%</td></tr>
<tr><td>success rate</td><td></td></tr>
<tr><td>결론</td><td></td><td>단일 치아 임플란트와 단일 크라운 모두에서 생존율 (98.4%) 은 높았으나, 합병증이 많아서 성공률은 상당히 낮았음(84.9%) .</td></tr>
<tr><td>기타</td><td></td><td></td></tr>
<tr><td>- 재정지원</td><td></td><td>공적지원
This study was funded by the NDCS Internal Research Fund.</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">34</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Wittneben (2017)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>스위스</td></tr>
<tr><td>• 연구기관</td><td>다기관
2 centers, the Universities of Bern and Geneva</td></tr>
<tr><td>• 연구기간</td><td>2009.08-2012.08</td></tr>
<tr><td rowspan="10">연구대상</td><td>• 포함기준</td><td>1. Subjects must have voluntarily signed the informed consent form before any study-related action
2. Males and females aged at least 18 y
3. Single-tooth gaps in the anterior maxilla position 14 to 24 (FDI)
4. Successfully osseointegrated single-tooth implant inserted at least 16 wk after tooth extraction
5. Full mouth plaque index (PI) according to O'Leary ≤25%
6. Implant axis compatible with transocclusal screw retention (screw access palatal of incisal edges)</td></tr>
<tr><td>• 제외기준</td><td>Surgical exclusion criteria
1. Systemic disease that would interfere with dental implant therapy
2. Any contraindications for oral surgical procedures
3. History of local irradiation therapy
4. Patients who smoked 〉10 cigarettes per day or tobacco equivalents or chewed tobacco
5. Subjects who had undergone administration of any investigational device within 30 d of enrollment in the study
6. Conditions or circumstances, in the opinion of the investigator, that would prevent completion of study participation or interfere with analysis of study results, such as history of noncompliance
7. Physical or mental handicaps that would interfere with the ability to perform adequate oral hygiene
8. Pregnant or breastfeeding women Dental exclusion criteria
9. Existing implants in the adjacent position
10. Removable dentures or unrestored tooth gaps in the opposing dentition
11. Patients with inadequate oral hygiene or unmotivated for adequate home care
12. Probing pocket depth of ≥4 mm on one of the teeth immediately adjacent to the dental implant site
13. Lack of primary stability of the implant
14. Inappropriate implant position for the prosthetic requirements
15. Major simultaneous augmentation procedures
16. Insufficient stability of the implant Prosthetic exclusion criteria
17. Screw access position located too close to the planned incisal edge
18. Need of angled abutment due to prosthetic malposition of the implant
19. Height of the abutment is 〈65% of the height of the complete restoration
20. Severe bruxing or clenching habits</td></tr>
<tr><td>• 표본수</td><td>40/40</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>NR</td></tr>
<tr><td>• 성</td><td>NR</td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>40</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>40</td><td>100</td></tr><tr><td>소구치(Premolar)</td><td>0</td><td>0</td></tr><tr><td>대구치(Molar)</td><td>0</td><td>0</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>40</td><td>100</td></tr><tr><td>하악(Mandible)</td><td>0</td><td>0</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>implant (Bone Level Implant 4.1-mm diameter, length 8 or 10 or 12 mm; Institut Straumann AG)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>16-24 weeks</td></tr>
</table>

보철타입		screw-retained
중재법 및 비교치료법	• 중재법	CAD/CAM Abutment
	• 비교치료법	Prefabricated Abutment
추적관찰	• Recall rate	97.5% (39/40)
	• 추적관찰기간	평균 : NR /최소 : NR /최대: 1y
결과 평가기준	survival	A surviving implant was defined as an implant in place at the time of follow-up.
	success	NR
결과	**survival rate**	1y 100%(39/39)
	success rate	NR
결론		두 보철 방법의 임플란트 모두 상악 전치부의 단일 임플란트 크라운 복원에 가치있는 치료 옵션임.
기타		
- 재정지원		사적지원 Institut Straumann AG has provided material (implant prosthetic components) and financial support for the included patient treatment for this study. The authors are grateful to Gabriel Fischer (significantis GmbH) for his assistance regarding the statistical analysis. The authors declare no potential conflicts of interest with respect to the authorship and/or publication of this article.

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">35</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Cooper (2016)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>미국</td></tr>
<tr><td>• 연구기관</td><td>NR</td></tr>
<tr><td>• 연구기간</td><td>NR</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>Cooper LF, Reside G, Stanford C, Barwacz C, Feine J, Abi Nader S, et al. A multicenter randomized comparative trial of implants with different abutment interfaces to replace anterior maxillary single teeth. Int J Oral Maxillofac Implants 2015;30:622-32. 참고</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>128/128</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>45±16 (18 to 81)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>128</td><td>100</td></tr><tr><td>male</td><td>56</td><td>44</td></tr><tr><td>female</td><td>72</td><td>56</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>128</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>82</td><td>64</td></tr><tr><td>canines</td><td>13</td><td>10</td></tr><tr><td>소구치(Premolar)</td><td>33</td><td>26</td></tr><tr><td>대구치(Molar)</td><td>0</td><td>0</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>128</td><td>100</td></tr><tr><td>하악(Mandible)</td><td>0</td><td>0</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>3 different implants were included: conical interface (CI; Osseo- Speed; DENTSPLY Implants), flat-to-flat interface (FI; NobelSpeedy Replace; Nobel Biocare), and platform switch interface (PS; NanoTite Certai Prevail; BIOMET 3i)</td></tr>
<tr><td>• 수술시기 (발치-수술)</td><td>20 weeks</td></tr>
<tr><td>• 보철시기 (수술-보철)</td><td>12 weeks</td></tr>
<tr><td>보철타입</td><td colspan="2">cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>CI (Osseo- Speed; DENTSPLY Implants)</td></tr>
<tr><td>• 비교치료법</td><td>FI (NobelSpeedy Replace; Nobel Biocare), PS (NanoTite Certai Prevail; BIOMET 3i)</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>1y- 95.3% (122/128)
2y- 90.6% (116/128)
3y- 85.9% (110/128)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 2.4y /최소 : NR /최대:3y</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 x따라 구분</td></tr>
<tr><td></td><td>success</td><td>NR</td></tr>
<tr><td>결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>1y</td><td>126</td><td>128</td><td>98.4</td></tr><tr><td>Abutment and crown survival</td><td>1y</td><td>126</td><td>126</td><td>100</td></tr><tr><td>free of complications involving the implant, abutment, and/or adjacent peri-implant tissues</td><td>2.4y</td><td>118</td><td>128</td><td>92</td></tr></table></td></tr>
</table>

	success rate	NR
결론		CAD/CAM zirconia abutments restored with cemented lithium disilicate crowns은 3가지 다른 implant-abutment interface designs 에서 높은 생존률을 보임. abutment or abutment screw fracture이 발생하지 않음. 2.4년 후에 관찰된 기술적 합병증은 경미하고 가역적이었음. CAD/CAM zirconia abutments with cemented lithium disilicate crowns은 2.4년간 높은 기술 및 생물학적 성공률을 보임
기타		
- 재정지원		사적지원 Sponsored by Dentsply Implants.

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">36</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Cosyn (2016)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>벨기에</td></tr>
<tr><td>• 연구기관</td><td>단일기관
University of Ghent, Faculty of Medicine and Health Sciences, Dental School, Department of Periodontology and Oral Implantology, De Pintelaan 185, B-9000 Ghent, Belgium</td></tr>
<tr><td>• 연구기간</td><td>2009.01-2010.04</td></tr>
<tr><td rowspan="9">연구대상</td><td>• 포함기준</td><td>single immediate implant 가 필요한 환자
• at least 18 years old;
• good oral hygiene defined as fullmouth plaque score ≤25% (O'eary et al. 1972);
• presence of a single failing tooth in the anterior maxilla (15-25) with both neighbouring teeth present;
• no mucosal defects in reference to adjacent and contra-lateral teeth;
• thick gingival biotype based on the lack of transparency of a periodontal probe through the gingival margin when probing the buccal sulcus of the failing tooth (De Rouck et al. 2009b);
• adequate bone height apically to the alveolus of the failing tooth (≥5 mm) to ensure a minimal implant insertion torque of 35 Ncm;
• signed informed consent.</td></tr>
<tr><td>• 제외기준</td><td>• systemic diseases;
• smoking;
• bruxism, lack of posterior occlusion;
• periodontal disease or history of periodontal disease;
• presence of active infection (pus, fistula) around the failing tooth;
• incomplete buccal bone wall after extraction of the failing tooth.</td></tr>
<tr><td>• 표본수</td><td>22/22</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>50세(27-74)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>22</td><td>100</td></tr><tr><td>male</td><td>12</td><td>54.5</td></tr><tr><td>female</td><td>10</td><td>45.5</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>22</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>17</td><td>77.3</td></tr><tr><td>소구치(Premolar)</td><td>4</td><td>18.2</td></tr><tr><td>대구치(Molar)</td><td>0</td><td>0</td></tr><tr><td>cuspid</td><td>1</td><td>4.5</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>22</td><td>100</td></tr><tr><td>하악(Mandible)</td><td>0</td><td>0</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>NobelActive®, Nobel Biocare, Göteborg, Sweden</td></tr>
<tr><td>• 수술시기 (발치-수술)</td><td>immediate</td></tr>
<tr><td>• 보철시기 (수술-보철)</td><td>approximately 3 hours</td></tr>
<tr><td colspan="2">보철타입</td><td>screw or cemented</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>1y- 95.5%(21/22)
5y- 81.8% (18/22)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : 1y /최대: 5y</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>임플란트 유지 여부</td></tr>
<tr><td>success</td><td>NR</td></tr>
</table>

<table>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>
<table>
<tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr>
<tr><td>Implant survival rate</td><td>3m</td><td>21</td><td>22</td><td>95.5</td></tr>
<tr><td>Implant survival rate</td><td>6m</td><td>21</td><td>22</td><td>95.5</td></tr>
<tr><td>Implant survival rate</td><td>12m</td><td>20</td><td>21</td><td>95.2</td></tr>
<tr><td>Implant survival rate</td><td>60m</td><td>17</td><td>18</td><td>94.4</td></tr>
</table>
</td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">단일 immediate 임플란트는 장기적으로 높은 임플란트 생존율과 제한적인 골손실을 보여줌. 그러나 1년후 mid-facial recession, mid-facial contour and alveolar process deficiency 악화되었음. 심미적인 합병증 발생률이 8/17이므로, type I placemensms 일상적인 진료에 권장되지 않음</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">사적지원
Prof. Cosyn has a collaboration agreement with Nobel Biocare G€oteborgSweden Prof. De Bruyn has collaboration agreements with Dentsply Implants (York, Pennsylvania, USA) and Southern Implants (Irene, South-Africa).
The study was self-funded by the authors and their institutions. Nobel Biocare, Belgium, provided free materials to be used in the study</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">37</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Dierens (2016)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>스웨덴</td></tr>
<tr><td>• 연구기관</td><td>단일기관
the Centre of Dental Specialist Care in Malmö, Sweden.</td></tr>
<tr><td>• 연구기간</td><td>1987-1993</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>1987-1993년 사이에 연구기관에서 단일 치아 임플란트를 받은 환자
Additional inclusion criteria were the presence of neighboring natural teeth, the availability of periapical radiographs, and at least one control visit after crown placement at the Specialist Clinic.</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>50/59</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>42.4 years (33-75)
Dierens M, Vandeweghe S, Kisch J, Nilner K, De Bruyn H. Long-term follow-up of turned single implants placed in periodontally healthy patients after 16-2 years: radiographic and peri-implant outcome. Clin Oral Implants Res 2012; 23:197-04. 참고</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>50</td><td>100</td></tr><tr><td>male</td><td>28</td><td>56</td></tr><tr><td>female</td><td>22</td><td>44</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td>NR</td></tr>
<tr><td>• 임플란트명</td><td>NR</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>12 weeks</td></tr>
<tr><td>보철타입</td><td colspan="2">cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td>• 비교치료법</td><td>NA</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>NR</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : 16y /최대: 22y</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>Implant Survival. Survival of the implant was confirmed for all patients initially treated with a single implant by a clinical examination and/or telephone call in 2009. For patients that could not be contacted by phone, the date of their last visit to the clinic was defined as the confirmed survival time.
Prosthetic Survival. Survival of the original abutment or crown was defined as the initial abutment or crown still being present and in function during the investigation, irrespective of its condition. This was confirmed by clinical and radiographic examination, patient interview, and patient file inspection</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>22y 100%(59/59)</td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">단일 임플란트의 보철 생존율은 16-22년 후에 고무적임. 그러나 환자의 66%는 후속 조치 중에 적어도 한번의 합병증이 발생함.</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">공적지원/ 사적지원/ 지원없음 (statement 기술)
The authors would like to acknowledge the patients who participated in this study, and express their gratitude to all coworkers at the Centre of Dental Specialist Care, Malmö, Sweden.We appreciate the input of Ulf Lindén who initiated the study, and we acknowledge the financial support of this research project by Folktandvården, Region Skåne, Sweden.</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">38</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Donati (2016)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>스웨덴</td></tr>
<tr><td>• 연구기관</td><td>단일기관
- Sahlgrenska Academy, Gothenburg University</td></tr>
<tr><td>• 연구기간</td><td>NR</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>포함/ 제외기준 영어로 기술(summary는 간략하게 한글)</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>40/45</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>40.9세(20-71)</td></tr>
<tr><td>• 성</td><td>NR</td></tr>
<tr><td>• 치아 위치</td><td>
<table>
<tr><th></th><th>N</th><th>%</th></tr>
<tr><td>total</td><td>35</td><td>100</td></tr>
<tr><td>위치 1</td><td></td><td></td></tr>
<tr><td>전치(Anterior)</td><td>-</td><td>-</td></tr>
<tr><td>소구치(Premolar)</td><td>-</td><td>-</td></tr>
<tr><td>대구치(Molar)</td><td>-</td><td>-</td></tr>
<tr><td>위치 2</td><td></td><td></td></tr>
<tr><td>상악(Maxilla)</td><td>29</td><td>82.9</td></tr>
<tr><td>하악(Mandible)</td><td>6</td><td>17.1</td></tr>
</table>
</td></tr>
<tr><td>• 임플란트명</td><td>implant installation (screwshaped and self-tapping Astra Tech TiOblast ST-implants; Astra Tech AB, M€olndal, Sweden)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>3 (mandible) or 6 (maxilla) months
final metal/porcelain prosthetic crown was cemented: 4 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Implant</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>12y (환자기준): 77.5% (31/40)
12y (치아기준): 77.8% (35/45)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대: 12y</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="3">결과</td><td colspan="2">
<table>
<tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr>
<tr><td>the overall survival rate</td><td>12y</td><td>34</td><td>35</td><td>97.1</td></tr>
</table>
</td></tr>
<tr><td>survival rate</td><td>Of the nine patients that dropped out from the study during the 12 years of follow-up one lost the implant after 2.5 years due to disintegration, two patients were deceased (one before abutment connection/crown insertion) and six discontinued the follow-up examinations because of geographic relocation.</td></tr>
<tr><td>success rate</td><td>bone loss 기준 - 12y 97.1%(34/35)
모든 complication 기준 - 91.4%(32/35)</td></tr>
<tr><td>결론</td><td colspan="2">Astra Tech dental implants의 사용이 단일 치아 대체 보철물에 대한 유효한 치료 대안이 됨</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">사적지원
- Drs. Donati, Ekestubbe, Lindhe, and Wennstrom report lecture fees from Dentsply Implants IH. The authors declare no potential conflicts of interest with respect to the authorship and/or publication of this article.</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">39</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Fenner (2016)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>스위스</td></tr>
<tr><td>• 연구기관</td><td>단일기관
Department of Fixed and Removable Prosthodontics and Dental Material Science at the University of Zurich,Switzerland</td></tr>
<tr><td>• 연구기간</td><td>2002-2006</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>임플란트 주변 연조직 색상에 대한 올-세라믹 및 PFM 수복물의 효과를 확인한 이전 연구의 일부(Jung et al. 2008).</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>36/36</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>48 years (range 27-82 years)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>28</td><td>100</td></tr><tr><td>male</td><td>15</td><td>53.6</td></tr><tr><td>female</td><td>13</td><td>46.4</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td>NR</td></tr>
<tr><td>• 임플란트명</td><td>implant (Straumann Dental Implant System; Straumann AG, Basel, Switzerland)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR (Jung, R.E., Holderegger, C., Sailer, I., Khraisat, A.,
Suter, A. & Hammerle, C.H. (2008) The effect of all-ceramic and porcelain-fused-to-metal restorations on marginal peri-implant soft tissue color: a randomized controlled clinical trial. International Journal of Periodontics and Restorative Dentistry 28: 357-365. 참고)</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>12 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>all-ceramic crowns on aluminum oxide-based abutments</td></tr>
<tr><td>• 비교치료법</td><td>metal abutments on porcelain-fused-to-metal crowns</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>77.7 (28/36)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 7.2y /최소 : 5.3y /최대: 9.3y</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>survival rate of the restoration</td><td>7.2Y</td><td>28</td><td>28</td><td>100</td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">all-ceramic restorations은 100%의 높은 생존율을 나타내며, 7.2년의 관찰기간 동안 metal과의 차이가 없었음</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">공적지원
This study was supported and funded by the Clinic for Fixed and Removable Prosthodontics and Dental Material Science, Center for Dental Medicine, University of Zurich, Switzerland.</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">40</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Gulje (2016)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>네덜란드</td></tr>
<tr><td>• 연구기관</td><td>NR</td></tr>
<tr><td>• 연구기간</td><td>NR</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>2 년 동안 상악 또는 하악 구치부에 하나 이상의 치아가 누락되고 뼈 높이가 6 ~ 8mm 인 환자 [아래 2개 연구의 subanalysis]
• “10. Gulje FL, Raghoebar GM, Vissink A, Meijer HJA. Single crowns in the resorbed posterior maxilla supported by either 6-mm implants or by 11-mm implants combined with sinus floor elevation surgery: A 1-year randomized controlled trial. Eur J Oral Implantol 2014;7:247-55. (2_59_Gulje_2014)“ posterior maxilla에 6mm 임플란트 환자
• “11. Gulje FL, Raghoebar GM, Vissink A, Meijer HJA. Single restorations in the resorbed posterior mandible supported by 6-mm implants: A 1-year prospective case series study. Clin Implant Dent Relat Res 2015;17:e465-471.” posterior mandible 에 6mm 임플란트 환자</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>37/47</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>54세 (30-71)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>37</td><td>100</td></tr><tr><td>male</td><td>12</td><td>32.4</td></tr><tr><td>female</td><td>25</td><td>67.6</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td>posterior 47 (100%)</td></tr>
<tr><td>• 임플란트명</td><td>OsseoSpeed 4.0S implants, Dentsply</td></tr>
<tr><td>• 수술시기 (발치-수술)</td><td>12 weeks</td></tr>
<tr><td>• 보철시기 (수술-보철)</td><td>3 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>cemented</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Single implant</td></tr>
<tr><td>• 비교치료법</td><td>NA</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>1y: 100% (37/37)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 1y</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>1y</td><td>47</td><td>47</td><td>100</td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">높은 임플란트 임플란트 비율은 1 년의 추적 기간 동안 임플란트 주변 뼈 변화 또는 보철 합병증의 증가를 동반하지 않음.</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">지원없음
This research was supported by the authors’ institution. The authors declare that there is no conflict of interest.</td></tr>
</table>

연번(Ref ID)	41	
1저자(출판연도)	Meloni (2016)	
연구방법	• 연구설계	RCT
	• 연구국가	이탈리아
	• 연구기관	다기관 (3개 기관)
	• 연구기간	2011.11-2013.02
연구대상	• 포함기준	• Age ≥ 18 years; • Need for a single bilateral implant-supported crown in the posterior area; • Stable interocclusal relationship; • Residual bone height ≥10 mm; • Residual bone width ≥ 6 mm with at least 5 mm of keratinised gingiva crestally; • Provided written informed consent.
	• 제외기준	• General contraindications for implant surgery; • Lack of occluding dentition in the area intended for implant placement; • Periodontitis; • Severe bruxism; • Immunosuppression; • Previous history of irradiation of the head and neck area; • Uncontrolled diabetes; • Heavy smoker (〉 10 cigarettes/day); • Probing pocket depth (PPD) 〉 4 mm and/or bleeding on probing (BOP) 〉 25%; • Current or past treatment with bisphosphonates; • Substance abuse; • Psychiatric disorder; • Inability to complete a 5-year post-loading follow-up; • Lactation; • Implant insertion torque less than 35 Ncm at implant placement.
	• 표본수	18/36
	• 표본수집방법	NR
	• 연령	48 (28-70)
	• 성	NR
	• 치아 위치	NR
	• 임플란트명	Implants (Nobel Replace Tapered Groovy, Nobel Biocare, Goteborg, Sweden)
	• 수술시기 (발치-수술)	12 weeks
	• 보철시기 (수술-보철)	24 weeks
보철타입		screw
중재법 및 비교치료법	• 중재법	switching platform
	• 비교치료법	regular platform
추적관찰	• Recall rate	3y: 100% (36/36) 임플란트
	• 추적관찰기간	평균 : NR /최소 : NR /최대: 3y
결과 평가기준	survival	Implant/crown failure Removal of implants were dictated by implant mobility, progressive marginal bone loss, infection or implant fracture. The stability of individual implants was measured by the prosthodontist (PM) at the time of temporary and definitive crown delivery (3 and 6 months after implant placement), by applying 35 Ncm of removal torque.
	success	-
결과	**survival rate**	<table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival</td><td>3y</td><td>36</td><td>36</td><td>100</td></tr></table>
	success rate	
결론		두 플랫폼 모두 로딩 후 3년간 임상 및 방사선적 결과는 비슷함
기타		
- 재정지원		지원없음 This study was not supported by any company. All authors declare no conflict of interest.

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">42</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Paolantoni (2016)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>이탈리아</td></tr>
<tr><td>• 연구기관</td><td>단일기관
Department of Neurosciences, Reproduction and Odontostomatological Sciences of the University of Naples “Federico II.”</td></tr>
<tr><td>• 연구기간</td><td>2007.02-2010.07</td></tr>
<tr><td rowspan="7">연구대상</td><td>• 포함기준</td><td>상악 전치부에 단일 임플란트 식립이 필요한 환자
The selected patients were nonsmokers; they were verbally informed and gave their written consent.</td></tr>
<tr><td>• 제외기준</td><td>patients refusing to sign the agreement, patients with poor oral hygiene (Full-Mouth Plaque Score (FMPS) ≥ 20% at baseline; Full- Mouth Bleeding Score (FMBS) ≥ 20% at baseline) or with a periodontal disease, and patients with local infections of the soft tissues or affected by psychiatric disorder or pregnant women.</td></tr>
<tr><td>• 표본수</td><td>65/74</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>53 ± 4 세</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>65</td><td>100</td></tr><tr><td>male</td><td>21</td><td>32.3</td></tr><tr><td>female</td><td>44</td><td>67.7</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td>NR</td></tr>
<tr><td>• 임플란트명</td><td>implants ((Thommen Medical AG, Grenchen, Switzerland)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>[9] W. Becker, B. E. Becker, H. Israelson et al., “One-step surgical placement of Br ° anemark implants: a prospective multicenter clinical study,” International Journal of Oral and Maxillofacial Implants, vol. 12, no. 4, pp. 454-62, 1997.
[10] R. Adell, U. Lekholm, B. Rockler, and P. I. Branemark, “A 15-year study of osseointegrated implants in the treatment of the edentulous jaw,” International Journal of Oral Surgery, vol. 10, no. 6, pp. 387-16, 1981. 참고</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>24 weeks</td></tr>
<tr><td>보철타입</td><td colspan="2">cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Implant 2pieces</td></tr>
<tr><td>• 비교치료법</td><td>Implant 1 piece</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>100 % (65/65)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 :NR /최소 : NR /최대: 48m</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>implants showed mobility.</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>implant survival rate</td><td>4y</td><td>74</td><td>74</td><td>100</td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">단일 임플란트 보철물을 위한 zirconia anchorages는 단기간에 기술적 생물학적으로 좋은 결과를 보임</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">지원없음
The authors declare that there is no conflict of interests regarding the publication of this paper.</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">43</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Passos (2016)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>캐나다</td></tr>
<tr><td>• 연구기관</td><td>다기관</td></tr>
<tr><td>• 연구기간</td><td>NR</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>전치부에서 zirconia abutments를 이용한 단일 치아 임플란트를 한 환자 대상 후향적 연구</td></tr>
<tr><td>• 제외기준</td><td>Patients who presented with medical limitations (ASA class 3 or greater) and parafunctional activity were excluded</td></tr>
<tr><td>• 표본수</td><td>141/158</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>158</td><td>100</td></tr><tr><td>≤60 years old</td><td>143</td><td>90.5</td></tr><tr><td>〉60 years old</td><td>15</td><td>9.5</td></tr></table></td></tr>
<tr><td>• 성</td><td>〈환자기준〉<table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>141</td><td>100</td></tr><tr><td>male</td><td>50</td><td>35.5</td></tr><tr><td>female</td><td>91</td><td>64.5</td></tr></table>〈치아기준〉<table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>158</td><td>100</td></tr><tr><td>male</td><td>52</td><td>32.9</td></tr><tr><td>female</td><td>106</td><td>67.1</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td>NR</td></tr>
<tr><td>• 임플란트명</td><td>Standard platform implants
EX = 3i 3i, Miami, USA
RS = Nobel Replace Nobel Biocare, Goteborg, Sweden
Platform switching implants
AS = Astra Astra Tech AB, Molndal, Sweden
NA = Nobel Active Nobel Biocare
BL = Straumann BL Institut Straumann AG, Waldenburg,Switzerland</td></tr>
<tr><td>• 수술시기 (발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기 (수술-보철)</td><td>NR</td></tr>
<tr><td>보철타입</td><td colspan="2">cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>zirconia abutments를 이용한 단일 임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>추적관찰대상자: 2y 158, 5y 107, 7y 64, 12y 33</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대: 12y</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>12y 33/33 97.0% crown
Of the 14 complications, one crown was replaced due recession in an esthetic area.</td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">standard platform implants restored with zirconia abutments는 가장 오랜 관찰 기간동안 성공적이었으며, 전치부위에서 실행가능한 치료 대안임. platform switching implants with zirconia abutments 는 최대 5년간 잘 수행됨</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">NR</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">44</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Spies (2016)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>독일</td></tr>
<tr><td>• 연구기관</td><td>단일기관
Medical Center – University of Freiburg, Germany</td></tr>
<tr><td>• 연구기간</td><td>2008-2011</td></tr>
<tr><td rowspan="9">연구대상</td><td>• 포함기준</td><td>Main inclusion criteria were that the subjects were between 18 and 70 years old with a good systemic general state of health. The subjects had to have a stable occlusal relationship with no severe parafunctional habits. Furthermore, the patients had to be in need of an implant-supported single tooth restoration and had to provide a sufficient bone volume in the area of interest to allow the installation of an implant of at least 3 mm in diameter and of at least 9 mm in length. All included patients were informed about the content and duration of the study.</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>27/27</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>42.7±11.4 years (22-61)</td></tr>
<tr><td>• 성</td><td>NR</td></tr>
<tr><td>• 치아 위치</td><td>
<table>
<tr><td>total</td><td></td></tr>
<tr><td>위치 1</td><td></td></tr>
<tr><td>전치(Anterior)</td><td>4</td></tr>
<tr><td>Posterior</td><td>23</td></tr>
<tr><td>소구치(Premolar)</td><td></td></tr>
<tr><td>대구치(Molar)</td><td></td></tr>
<tr><td>위치 2</td><td></td></tr>
<tr><td>상악(Maxilla)</td><td>13</td></tr>
<tr><td>하악(Mandible)</td><td>14</td></tr>
</table>
</td></tr>
<tr><td>• 임플란트명</td><td>zirconia implants (Ziraldent FR1; Metoxit AG, Thayngen, Switzerland</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>Spies, B.C., Sperlich, M., Fleiner, J., Stampf, S. & Kohal, R.J. (2015a) Alumina reinforced zirconia implants: 1-year results from a prospective cohort investigation. Clinical Oral Implants Research 27: 481--490. 참고</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>NR</td></tr>
<tr><td>보철타입</td><td></td><td>cemented /screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Monolithic lithium-disilicate SCs supported by zirconia implants</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>1y- 88.9% (24/27)
2y- 85.2% (23/27)
3y- 85.2% (23/27)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 31.1±2.7 m /최소 : 25m /최대: 34m</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>The restorations were evaluated using a modification of the original United States Public Health Service (USPHS) criteria (Cvar & Ryge 2005)
Table 2. Modified USPHS criteria for the success and survival analyses of the single crown restorations
<table>
<tr><th></th><th>Alpha (A)</th><th>Bravo (B)</th><th>Charlie (C)</th><th>Delta (D)</th></tr>
<tr><td>Ceramic fracture</td><td>No fracture</td><td>Minor chipping</td><td>Major chipping</td><td>Bulk Fracture (Loss of reconstruction)</td></tr>
<tr><td>Occlusal roughness</td><td>No roughness</td><td>Slight roughness (Ø <2 mm)</td><td>Obvious roughness (Ø >2 mm)</td><td>Reconstruction needs to be replaced</td></tr>
<tr><td>Marginal integrity</td><td>No visible or soundable gap</td><td>Marginal gap slightly soundable</td><td>Explorer penetrates a significant crevice</td><td>Reconstruction needs to be replaced</td></tr>
<tr><td>Contour of reconstruction</td><td>Perfectly contoured</td><td>Slightly under-/overcontoured</td><td>Pronounced under-/overcontouring</td><td>Reconstruction inacceptable</td></tr>
<tr><td>Esthetics of reconstruction</td><td>Good esthetics</td><td>Slight mismatch in color (<1 Vitashade)</td><td>Severe color mismatch</td><td>Reconstruction inacceptable</td></tr>
<tr><td>Discoloration of margin</td><td>No discoloration</td><td>Discoloration</td><td>–</td><td>–</td></tr>
<tr><td>Rating</td><td>Success</td><td>Success</td><td>Survival</td><td>Failure</td></tr>
</table>
</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td>결과</td><td>survival rate</td><td>
<table>
<tr><td></td><td>시점</td><td>event</td><td>total</td><td>%</td></tr>
<tr><td>survival rate</td><td>3y</td><td>23</td><td>26</td><td>88.5</td></tr>
</table>
No fractures or chippings could be observed. Furthermore, no loss of</td></tr>
</table>

		retention or any further technical complication was observed in any group.
	success rate	NR
결론		Monolithic lithium-disilicate SCs supported by zirconia implants 는 3년의 관찰기간동안 좋은 생존율과 성공률을 보여줌
기타		
- 재정지원		사적지원 This investigation was supported by Ivoclar Vivadent (Schaan, Liechtenstein). Furthermore, the authors acknowledge the support of Dr. Markus Sperlich in the clinical execution of the investigation.

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">45</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Antina (2015)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>스페인</td></tr>
<tr><td>• 연구기관</td><td>단일기관/ 다기관 (기관명)</td></tr>
<tr><td>• 연구기간</td><td></td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>The inclusion criteria consisted of the following parameters: at least 1 missing posterior tooth, a Kennedy class III edentulous space, a single crown restoration, and an off-center placement of the dental implant.</td></tr>
<tr><td>• 제외기준</td><td>Patients who failed to meet any of the inclusion criteria were excluded from the study.</td></tr>
<tr><td>• 표본수</td><td>31/34</td></tr>
<tr><td>• 표본수집방법</td><td>연속적/비연속적
(제시하지 않은 것은 NR)</td></tr>
<tr><td>• 연령</td><td>56 ±12 years (38-86)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>31</td><td>100</td></tr><tr><td>male</td><td>11</td><td>35</td></tr><tr><td>female</td><td>20</td><td>65</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td>NR</td></tr>
<tr><td>• 임플란트명</td><td>dental implant (BTI Biotechnology Institute)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>16 weeks</td></tr>
<tr><td>보철타입</td><td colspan="2">screw/cemented</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>NA</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대: 3y</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>3y</td><td>33</td><td>34</td><td>100</td></tr></table>One implant failed 4 months after insertion.</td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">The distal offset placement of an implant는 mesiodistal space에 제한이 있을 때 단일 후방 치아 결손에 효율적인 치료 옵션임</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">NR</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">46</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Grandi (2015)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>pragmatic-RCT</td></tr>
<tr><td>• 연구국가</td><td>이탈리아</td></tr>
<tr><td>• 연구기관</td><td>다기관
five private dental clinics located in Beirut, Lebanon (three centres) and Modena, Italy (two centres)</td></tr>
<tr><td>• 연구기간</td><td>2014.01-2014.09</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>Any patient requiring a single implant, at least 8 mm long and 3.7 mm in diameter, to support a single crown, who was 18 years old or older, and able to understand and sign an informed consent form was eligible for inclusion in this trial. All patients received thorough explanations and signed a written informed consent form prior to being enrolled in the trial to document that they understood the
scope of the study (including procedures, follow-up evaluations, and any potential risks involved).</td></tr>
<tr><td>• 제외기준</td><td>• General contraindications to implant surgery.
• Irradiated in the head and/or neck with more than 70 Gy.
• Immunosuppressed or immunocompromised.
• Treated or under treatment with intravenous amino-bisphosphonates.
• Uncontrolled diabetes.
• Pregnant or nursing.
• Substance abusers.
• Psychiatric problems and/or unrealistic expectations.
• Poor oral hygiene and motivation.
• Untreated periodontitis.
• Acute infection/inflammation in the area intended for implant placement.
• Need of bone augmentation at implant insertion with the exception of filling bone-to-implant gaps for immediate post-extractive implants.
• Lack of opposite occluding dentition/prosthesis in the area intended for implant placement.
• Participation to other investigations, if the present protocol could not be properly adhered to.
• Unable to commit to a 10-year follow-up.
• Referred only for implant placement if the patient could not be followed at the treatment centre.</td></tr>
<tr><td>• 표본수</td><td>105/105</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>Immediate: 51.43 ± 12.43 (22-73)
Early: 45.51 ± 10.62 (21-66)
Conventional: 46.14 ± 12.56 (24-75)</td></tr>
<tr><td>• 성</td><td><table><tr><td></td><td>N</td><td>%</td></tr><tr><td>total</td><td>105</td><td>100</td></tr><tr><td>male</td><td>50</td><td>47.6</td></tr><tr><td>female</td><td>55</td><td>52.4</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><td></td><td>N</td><td>%</td></tr><tr><td>total</td><td>105</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr></table></td></tr>
</table>

전치(Anterior)	12	11.4
canine	3	2.9
소구치(Premolar)	49	46.7
대구치(Molar)	41	39.0
위치 2		
상악(Maxilla)	65	61.9
하악(Mandible)	40	39.1

	• 임플란트명	JD Evolution (J DentalCare, Modena, Italy) tapered thread titanium implants with internal connection and double acid-etched treated surface
	• 수술시기 (발치-수술)	immediate early (3 weeks) conventional (4 months)
	• 보철시기 (수술-보철)	4 weeks
보철타입		cemented / screw
중재법 및 비교치료법	• 중재법	immediacte
	• 비교치료법	early, conventional
추적관찰	• Recall rate	96.2 % (103/105)
	• 추적관찰기간	평균 : NR /최소 : NR /최대:1 y
결과 평가기준	survival	• Crown failure: whether it was not possible to place the crown due to implant failures or secondary to implant losses, or replacement of the definitive crown for any reason. • Implant failure: implant failure was defined as implant mobility and/or any infection dictating implant removal or any mechanical failure rendering the implant unusable, such as implant fracture or deformation of the implant-abutment connection. The stability of each implant was measured manually by tightening the abutment screw at definitive crown delivery and using the handles of two dental mirrors without removing the crowns at 1-year post-loading.
	success	NR
결과	**survival rate**	<table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>implant/crown survival rate</td><td>1y</td><td>101</td><td>103</td><td>98.1</td></tr></table> patient who was a heavy smoker; this was placed in position 46, characterised by hard bone quality. Postoperatively the implant displayed pain and pus and was **removed** 3 weeks after its placement. The patient refused to have the implant replaced.
	success rate	NR
결론		단일 임플란트는 즉시, 3주, 4개월 로딩에 따른 주요 임상적 차이가 없음
기타		
- 재정지원		사적지원 This trial was partially funded by JDentalCare, the manufacturer of the implants evaluated in this investigation, however data belonged to the authors and by no means did the manufacturer interfere with the conduct of the trial or the publication of the results.

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">47</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Guo (2015)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>호주</td></tr>
<tr><td>• 연구기관</td><td>단일기관
ISSCs at the Melbourne Dental School (MDS) in Victoria, Australia.</td></tr>
<tr><td>• 연구기간</td><td>2005.01.01.-2009.12.31</td></tr>
<tr><td rowspan="7">연구대상</td><td>• 포함기준</td><td>Royal Dental Hospital of Melbourne (RDHM) database에서 단일 치아
Patients who had at least one implant placed or restored at the RDHM within the study period of 1 January 2005 to 31 December 2009 were included in the study. Clinicians who placed and/or restored implants included postgraduate students enrolled in the Periodontics, Oral and Maxillofacial Surgery, Prosthodontics and the Postgraduate Diploma in Clinical Dentistry (Implants) programmes, as well as RDHM staff (specialist practitioners). An electronic search of the hospital database (Titanium Software, Spark Dental Technology, Australia) using relevant treatment codes identified that 1074 implants were placed during the study period.</td></tr>
<tr><td>• 제외기준</td><td>patient records were unavailable or incomplete</td></tr>
<tr><td>• 표본수</td><td>406/622</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>median 44 (17-82)
<table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>406</td><td>100</td></tr><tr><td>〈20</td><td>25</td><td>6.2</td></tr><tr><td>21-30</td><td>62</td><td>15.3</td></tr><tr><td>31-40</td><td>73</td><td>18.0</td></tr><tr><td>41-50</td><td>113</td><td>27.8</td></tr><tr><td>51-60</td><td>70</td><td>17.2</td></tr><tr><td>61-70</td><td>47</td><td>11.6</td></tr><tr><td>71-80</td><td>15</td><td>3.7</td></tr><tr><td>81-90</td><td>1</td><td>0.2</td></tr></table></td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>406</td><td>100</td></tr><tr><td>male</td><td>121</td><td>29.8</td></tr><tr><td>female</td><td>285</td><td>70.2</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td>NR</td></tr>
<tr><td>• 임플란트명</td><td>NR</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>NR</td></tr>
<tr><td>보철타입</td><td colspan="2">cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>NA</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대: 5y17</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>Implant survival was defined as an implant remaining in situ at the end of the study period.</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td>결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>5y</td><td>605</td><td>622</td><td>97.2</td></tr></table>
Seventeen implants were removed or lost as a result of failed osseointegration, giving an overall failure incidence of 2.7% at 620 implant sites involving 622 implants (Table 3).</td></tr>
</table>

		A total of 622 implant fixtures and 444 ISSCs were inserted into 406 patients. (implant-supported single crowns (ISSC)
	success rate	NR
결론		단일 임플란트의 생존율은 높았으나 합병증은 자주 발생하였음.
기타		
- 재정지원		공적지원 This study was approved by the Dental Health Services Victoria Human Research Ethics Committee (Approval No. 217) and funded by the Melbourne Dental School Research Committee.

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">48</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Ioannidis (2015)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>스위스/미국</td></tr>
<tr><td>• 연구기관</td><td>다기관
two centres (Clinic of Fixed and Removable Prosthodontics and Dental Material Science, Center of Dental Medicine, University of Zurich, Zurich, Switzerland and Department of Restorative Dentistry and Biomaterials Sciences, Harvard School of Dental Medicine, Boston,MA, USA)</td></tr>
<tr><td>• 연구기간</td><td>2010.01-2010.12</td></tr>
<tr><td rowspan="10">연구대상</td><td>• 포함기준</td><td>• ≥18 years of age
• No medical history in which any elective oral surgical intervention would be contraindicated
• No heavy smoking (〉20 cigarettes per day)
• No active periodontal disease
• Full-mouth plaque score (FMPS) and full-mouth bleeding score (FMBS) 〈25%
• Need of an implant-supported crown at a single-tooth gap in regions 11-15, 21-25, 31-35, 41-45 (FDI)
• Presence of mesial and distal natural teeth
• Adequate quantity and quality of native bone to allow the placement of an implant with 4.1 mm diameter and 8 mm length
• Primary implant stability
• Possibility of re-entry surgery
• 3 months after implant placement</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>40/40</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>(Table S1) 참고</td></tr>
<tr><td>• 성</td><td>(Table S1) 참고</td></tr>
<tr><td>• 치아 위치</td><td><table><tr><td></td></tr><tr><td>total</td></tr><tr><td>위치 1</td></tr><tr><td>전치(Anterior)</td></tr><tr><td>소구치(Premolar)</td></tr><tr><td>대구치(Molar)</td></tr><tr><td>위치 2</td></tr><tr><td>상악(Maxilla)</td></tr><tr><td>하악(Mandible)</td></tr></table>(Table S1) 참고</td></tr>
<tr><td>• 임플란트명</td><td>TiZr 3.3 mm diameter implant (StraumannBone Level RoxolidSLActive, Straumann AG)/Ti 4.1 mm diameter implant (Straumann Bone Level Ti SLActive, Straumann AG)</td></tr>
<tr><td>• 수술시기 (발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기 (수술-보철)</td><td>12 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>screw- or cement</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>TiZr 3.3 mm diameter implant (StraumannBone Level RoxolidSLActive, Straumann AG)</td></tr>
<tr><td>• 비교치료법</td><td>Ti 4.1 mm diameter implant (Straumann Bone Level Ti SLActive, Straumann AG)</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>95% (38/40)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대: 5y</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>Implant survival was assessed at 1 year after implant placement. The implant survival was defined as the implant being in place and stable.</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>1y</td><td>38</td><td>38</td><td>100</td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
</table>

결론	전치 및 소구치 부위의 단일 크라운 지지를 위해 직경이 좁은 TiZr 임플란트를 사용하면 1년 동안 성공적인 조직integration과 임상 성능을 얻을 수 있음
기타	
- 재정지원	공적지원 Dres. Benic, Gallucci, Weber, Jung and Prof. H€ ammerle provided lectures or consultations, which were reimbursed from Institute Straumann. The authors report no financial interests related to any products involved in this study. This study was supported by an unrestricted grant from ITI Foundation, by the Clinic of Fixed and Removable Prosthodontics and Dental Material Science, Center of Dental Medicine, University of Zurich, Switzerland, and by the Department of Restorative Dentistry and Biomaterials Sciences, Harvard School of Dental Medicine.

연번(Ref ID)	49	
1저자(출판연도)	Lops (2015)	
연구방법	• 연구설계	코호트 연구
	• 연구국가	이탈리아
	• 연구기관	다기관 Dental Clinic of Biomedical Sciences Institute, S. Paul Hospital, University of Milan, Italy, and at the Dental Clinic, Department of Medicine, Surgery and Dentistry, University of Padova, Italy
	• 연구기간	2010.09-2011.06
연구대상	• 포함기준	상악 및 하악의 전치부위의 단일 결손 수복이 필요한 환자 Inclusion criteria were (i) single edentulism in the anterior maxilla or mandible (from first premolar forward); (ii) absence of local inflammation; (iii) absence of oral mucosal disease; (iv) adequate oral hygiene; (v) extraction at least 6 months before; and (vi) adequate bone volume at the implant site (for placement of an implant at least 3.5 mm in diameter and 8 mm in length) evaluated on intraoral periapical radiographs and clinical evaluation.
	• 제외기준	Exclusion criteria were (i) patients with systemic diseases (such as heart, coagulation, and leukocyte diseases or metabolic disorders); (ii) history of radiation therapy in the head and neck region; (iii) current treatment with steroids; (iv) neurological or psychiatric handicap that could interfere with the treatment; (v) immuno-compromised status, including infection with human immunodeficiency virus; (vi) severe clenching or bruxism; (vii) smoking habit (more than 15 cigarettes per day); (viii) drug or alcohol abuse; and (ix) inadequate compliance.
	• 표본수	72/72 (환자/임플란트)
	• 표본수집방법	연속적
	• 연령	46 (26-58)
	• 성	<table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>72</td><td>100</td></tr><tr><td>male</td><td>39</td><td>54.2</td></tr><tr><td>female</td><td>33</td><td>45.8</td></tr></table>
	• 치아 위치	NR
	• 임플란트명	Osseospeed Dentsply Dental Implants, Astra Tech AB, M€olndal, Sweden
	• 수술시기 (발치-수술)	NR
	• 보철시기 (수술-보철)	3 weeks
보철타입		cemented / screw
중재법 및 비교치료법	• 중재법	Group 1: patients with zirconia stock abutments. Group 2: patients with titanium stock abutments.
	• 비교치료법	Group 3: patients with zirconia cad-cam abutments. Group 4: patients with titanium cad-cam abutments.
추적관찰	• Recall rate	100% (72/72) 환자 100% (72/72) 임플란트
	• 추적관찰기간	평균 : NR /최소 : 24m /최대:NR
결과 평가기준	survival	NR
	success	NR
결과	**survival rate**	2y 100% (72/72)
	success rate	NR
결론		전치부위에서 cad-cam abutments의 사용은 더 좋은 연조직의 안정성과 관련되어 있음. 이와 같은 관련성은 cad-cam titanium abutments을 titanium and zirconia stock abutment과 비교할 때 유의미 하다.
기타		
- 재정지원		NR

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">50</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Payer (2015)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>오스트리아</td></tr>
<tr><td>• 연구기관</td><td>단일기관
the Dental School, Medical University of Graz, Austria</td></tr>
<tr><td>• 연구기간</td><td>2009-2010</td></tr>
<tr><td rowspan="9">연구대상</td><td>• 포함기준</td><td>(i) Patients of 18 years or older who had given their informed, written consent; (ii) providing tooth gaps up to three missing units with a sufficient amount of horizontal
and vertical bone and soft tissue volume for the placement of implants with a minimum length of 10 mm and a width of 4 mm; (iii) acceptance of the scheduled protocol of clinical and radiographic analysis and maintenance.</td></tr>
<tr><td>• 제외기준</td><td>(i) smokers; (ii) signs of occlusal parafunctions (e.g. bruxers); (iii) present acute periodontal disease; (iv) lack of compliance or failure to give consent; (v) general contraindications against implant treatment or medication potentially compromising osseointegration (e.g. immunodeficiency, advanced systemic diseases, corticosteroid or bisphosphonate medication); (vi) pregnancy, assessed with a pregnancy test (HCG Schnelltest, DiaChrom bj-giagnostik, Giessen, Germany); (vii) previous irradiation in the neck/head area; (viii) need for bone augmentation and soft tissue augmentation procedures.</td></tr>
<tr><td>• 표본수</td><td>22/31</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>46 (24-77)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>22</td><td>100</td></tr><tr><td>male</td><td>13</td><td>59.1</td></tr><tr><td>female</td><td>9</td><td>40.9</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>31</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>5</td><td>16.1</td></tr><tr><td>소구치(Premolar)</td><td>2</td><td>6.5</td></tr><tr><td>대구치(Molar)</td><td>24</td><td>77.4</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>7</td><td>22.6</td></tr><tr><td>하악(Mandible)</td><td>24</td><td>77.4</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>• two-piece yttria-stabilized zirconia implants (Ziterion vario z, Ziterion GmbH, Uffenheim, Germany)
• standard two-piece titanium implants (Ziterionvario t)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>〉 24 weeks</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>16 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>All-ceramic restoration of zirconia two-piece implants</td></tr>
<tr><td>• 비교치료법</td><td>Titanium implants</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>100% (22/22)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대: 24m</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td></td><td>success</td><td>NR</td></tr>
<tr><td>결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>2y</td><td>30</td><td>31</td><td>96.8</td></tr><tr><td>- zirconia</td><td>2y</td><td>15</td><td>16</td><td>93.75</td></tr><tr><td>- titanium</td><td>2y</td><td>15</td><td>15</td><td>100</td></tr></table>
One zirconia implant in position of a second lower molar was lost after</td></tr>
</table>

		8 months in function.
	success rate	NR
결론		24 개월 후, 세라믹 임플란트의 성공률은 대조군과 비교하여 큰 차이를 보이지 않았음. Bonded zirconia implant abutment connection은 연구기간동안 적용 가능 한 것으로 파악되나, 추가적인 자료 확인이 필요할 것임.
기타		
- 재정지원		사적지원 The study was supported by Ziterion GmbH, Uffenheim, Germany.

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">51</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Shim (2015)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>한국</td></tr>
<tr><td>• 연구기관</td><td>단일기관
Hallym University Sacred Heart Hospital, Anyang, Republic of Korea</td></tr>
<tr><td>• 연구기간</td><td>2005.12-2012.12</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>해당 연구기관에서 October 2005 to October 2012 사이에 단일 치아 Ankylos® 임플란트 수복을 받은 성인 환자</td></tr>
<tr><td>• 제외기준</td><td>any underlying uncontrolled disease or health condition; e.g., severe liver or renal disease, complicated diabetes mellitus, or history of recent radiotherapy in the head and neck area or active chemotherapy.</td></tr>
<tr><td>• 표본수</td><td>257/450</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>47.8 ± 14.3 (16-81)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>257</td><td>100</td></tr><tr><td>male</td><td>133</td><td>51.8</td></tr><tr><td>female</td><td>124</td><td>48.2</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>450</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>100</td><td>22.2</td></tr><tr><td>소구치(Premolar)</td><td>130</td><td>28.9</td></tr><tr><td>대구치(Molar)</td><td>220</td><td>48.9</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>253</td><td>56.2</td></tr><tr><td>하악(Mandible)</td><td>197</td><td>43.8</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>Ankylos® implant</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>12-24 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>-</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 63.5 ± 16.0 months /최소 : 5y /최대: 8y</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>Variables related to the survival of implants included the 8-year CSR and the occurrence of implant failure, which was defined as any case of implant removal because of early osseointegration failure, removal because of serious marginal bone loss, or an implant or abutment fracture that could not be restored.</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>cumulative survival rate (CSR)</td><td>8y</td><td>444</td><td>450</td><td>98.7</td></tr><tr><td>survival</td><td>8y</td><td>251</td><td>257</td><td></td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">Ankylos® 임플란트는 한국인의 단일 치아 수복에 적합하였음. 비교적 빈번한 지대치 골절 (2.2 %)이 관찰되었으며 일부 골절로 임플란트 실패가 초래됨. 중년 환자, 어금니 위치 및 큰 임플란트 직경은 지대치 골절의 높은 발생률과 관련이 있었음.</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">NR</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">52</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Zembic_2015</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>스위스</td></tr>
<tr><td>• 연구기관</td><td>NR</td></tr>
<tr><td>• 연구기간</td><td>NR</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>Glauser R, Sailer I, Wohlwend A, Studer S, Schibli M, Scharer P. Experimental zirconia abutments for implantsupported single-tooth restorations in esthetically demanding regions: 4-year results of a prospective clinical study. Int J Prosthodont 2004; 17:285--290. 에 기술</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>27/54</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>NR</td></tr>
<tr><td>• 성</td><td><table><tr><td></td><td>N</td><td>%</td></tr><tr><td>total</td><td>27</td><td>100</td></tr><tr><td>male</td><td>11</td><td>40.7</td></tr><tr><td>female</td><td>16</td><td>59.3</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><td></td><td>N</td><td>%</td></tr><tr><td>total</td><td>31</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>15</td><td>48.4</td></tr><tr><td>canine</td><td>9</td><td>29.0</td></tr><tr><td>소구치(Premolar)</td><td>7</td><td>22.6</td></tr><tr><td>대구치(Molar)</td><td>0</td><td>0</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>28</td><td>90.3</td></tr><tr><td>하악(Mandible)</td><td>3</td><td>9.7</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>Implants (Brånemark System Mk II Regular Platform, Nobel Biocare, Göteborg, Sweden)</td></tr>
<tr><td>• 수술시기 (발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기 (수술-보철)</td><td>24 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>11y- 임플란트 57.4% (31/54), 환자 59.3% (16/27)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 11.3 (SD 0.9) years</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>Survival was defined as abutments/crowns remaining inserted throughout the observation period.</td></tr>
<tr><td>success</td><td>Success was defined as abutments/crowns not having any problems.</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><td></td><td>시점</td><td>event</td><td>total</td><td>%</td></tr><tr><td>abutments and crowns. survival rate</td><td>11y</td><td>31</td><td>31</td><td>100</td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">맞춤형 지르코니아 단일 임플란트는 전방 및 소구치에서 생존율이 높았음.</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">NR</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">53</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Borges (2014)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>포르투갈</td></tr>
<tr><td>• 연구기관</td><td>단일기관
the Department of Oral Surgery and Implant Dentistry of Private Medical Centre in Braganca</td></tr>
<tr><td>• 연구기간</td><td>2009.01-2010.01</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>anterior region of the maxilla에 단일 임플란트 받은 환자
The selection of the patients for the implant treatment included patients with teeth lost due to traumatic injury, endodontic failure or traditional fixed prostheses failure. The patient''s treatment included a single-tooth implant in the anterior maxilla, restored with a CAD/CAM abutment or custom metal abutment with metal-ceramic crown.</td></tr>
<tr><td>• 제외기준</td><td>The patients with edentulous sites due to periodontal disease and the cases where did not exist contact point between the implant crown and the teeth were excluded.</td></tr>
<tr><td>• 표본수</td><td>38/38</td></tr>
<tr><td>• 표본수집방법</td><td>연속적/비연속적
(제시하지 않은 것은 NR)</td></tr>
<tr><td>• 연령</td><td>48.7±12.9 (28-90)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>38</td><td>100</td></tr><tr><td>male</td><td>24</td><td>63.2</td></tr><tr><td>female</td><td>14</td><td>36.8</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>38</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>38</td><td>100</td></tr><tr><td>소구치(Premolar)</td><td>0</td><td>0</td></tr><tr><td>대구치(Molar)</td><td>0</td><td>0</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>38</td><td>100</td></tr><tr><td>하악(Mandible)</td><td>0</td><td>0</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>The implants (OsseoSpeedTM, AstraTech Dental, M€ ohndal, Sweden)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>7-8 / 6-10 weeks</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>8 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>94.7% (36/38)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 1y /최소 : NR /최대: NR</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>prosthetic survival rate - No technical complications, like abutment fracture, abutment loose or ceramic chipping, were reported</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>prosthetic survival rate</td><td>1y</td><td>36</td><td>36</td><td>100</td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">NR</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">NR</td></tr>
</table>

연번(Ref ID)	54	
1저자(출판연도)	Loungo (2014)	
연구방법	• 연구설계	전향적 환자군 연구
	• 연구국가	이탈리아
	• 연구기관	다기관 six clinical centres
	• 연구기간	2012.02-2013.02
연구대상	• 포함기준	immediately loaded single-tooth implants를 받은 환자 • any partially dentate patient, in need of replacement of a single missing or failing tooth at the time of recruitment • being at least 18 years old • in good systemic and oral health • physically and psychologically able to tolerate conventional surgical and restorative procedures • having sufficient residual bone to allow the placement of an implant at least 10.0 mm long with a 3.5 mm diameter • able to sign an informed consent form.
	• 제외기준	• chronic periodontitis with advanced loss of support. Chronic periodontitis with advanced loss of support was defined by periodontal pocking depths (PPD) 〉6 mm with clinical attachment loss (CAL) 〉4 mm, radiographic evidence of bone loss and increased tooth mobility • other oral disorders (vesiculo-bullous or ulcerative diseases, red or white lesions, salivary gland diseases, connective tissue or lymphoid lesions, cysts of the oral region, benign or malignant tumours) • need for major bone augmentation procedures with autogenous bone or bone substitutes prior to implant insertion, to obtain an ideal position for the implant (although a minor augmentation procedure to cover exposed threads or interproximal/buccal grafting owing to hard tissue deficiency was not an exclusion criterion) • presence of active infection (pus, fistula) around the failing tooth • loss or damage of the buccal bone crest (〉5 mm) after extraction of the failing tooth • lack of opposite occluding dentition in the area intended for implant placement • parafunctions (bruxism or clenching) • uncontrolled diabetes • immunocompromised status • radiotherapy in the maxillofacial region • chemotherapy • treatment with intravenous amino-bisphosphonates • psychiatric disorders.
	• 표본수	46/57
	• 표본수집방법	NR
	• 연령	44.5 (18-73) N / % / total 46 100 / 16-25 7 15.2 / 26-35 6 13.0 / 36-45 7 15.2 / 46-55 13 28.2 / 56-65 9 19.5 / 〉65 4 8.7
	• 성	N / % / total 46 100 / male 23 50 / female 23 50
	• 치아 위치	N / % / total 57 100 / 위치 1 / 전치(Anterior) 9 15.8 / Cuspids 3 5.2 / 소구치(Premolar) 31 54.4 / 대구치(Molar) 14 24.6 / 위치 2

		상악(Maxilla)	38	66.7
		하악(Mandible)	19	33.3
	• 임플란트명	AnyRidge, MegaGen, Gyeongbuk, South Korea		
	• 수술시기 (발치-수술)	immediate		
	• 보철시기 (수술-보철)	12 weeks		
보철타입		cemented or screwed		
중재법 및 비교치료법	• 중재법	임플란트		
	• 비교치료법	-		
추적관찰	• Recall rate	1y 95.65% (44/46) 환자수 1y 96.5% (55/57) 임플란트		
	• 추적관찰기간	평균 : NR /최소 : NR /최대: 1y		
결과 평가기준	survival	임플란트 유지 여부에 따라 구분		
	success	NR		
결과	**survival rate**	1y 98.2% (54/55) At the end of the study, only one implant was lost, in a healed site (second premolar) of the posterior maxilla of a 48-year old female patient who was a smoker and the failed implant (3.5 mm dia meter × 10.0 mm length) was placed in type III bone.		
	success rate	NR		
결론		즉시 로딩하는 단일 임플란트는 만족스러운 임상결과와 성공적인 치료절차가 될 수 있음		
기타				
- 재정지원		사적지원 MegaGen Implant Co., Gyeongbuk, South Korea, the manufacturer of the implants used in this investigation, partially supported this study by donating the implants and prosthetic components; however, the research data belonged to the authors and by no means did Megagen interfere with the conduct of the study or the publication of the results.		

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">55</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Tolentino (2014)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>브라질</td></tr>
<tr><td>• 연구기관</td><td>단일기관
Department of Dentistry, State University of Maringa, Maringa, Brazil</td></tr>
<tr><td>• 연구기간</td><td>2010.08-2010.12</td></tr>
<tr><td rowspan="9">연구대상</td><td>• 포함기준</td><td>턱의 후방부위에 임플란트가 지원되는 단일 유닛 보철 재활이 예정된 건강한 환자
(i) to sign voluntary informed consent for using his/her data; (ii) age 18 years old; (iii) to have a posterior area
scheduled to receive single-unit prosthetic rehabilitation supported by implant; and (iv) alveolar ridge about 5-6 mm wide.</td></tr>
<tr><td>• 제외기준</td><td>(i) previous bone augmentation procedure at implant site;
(ii) presence of untreated periodontitis; (iii) soft and/or hard tissues alterations; (iv) use of any drug that could affect bone metabolism (biphosphonates); (v) alcohol or tobacco abuse (〉10 cigarettes/day); (vi) presence of immunocompromising conditions (HIV-positive or
under therapy with immunosuppressive drugs); (vii) pregnancy; (viii) presence of parafunctional habits; and (ix) history of radiotherapy of the head/neck region</td></tr>
<tr><td>• 표본수</td><td>42/</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>57.2 years</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>42</td><td>100</td></tr><tr><td>male</td><td>18</td><td>42.9</td></tr><tr><td>female</td><td>24</td><td>57.1</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>TG</th><th>CG</th><th>Total</th></tr><tr><td>total</td><td>21</td><td>21</td><td>42</td></tr><tr><td>위치 1</td><td></td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>0</td><td>0</td><td>0</td></tr><tr><td>소구치(Premolar)</td><td>8</td><td>11</td><td>19</td></tr><tr><td>대구치(Molar)</td><td>13</td><td>10</td><td>23</td></tr><tr><td>위치 2</td><td></td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>9</td><td>10</td><td>19</td></tr><tr><td>하악(Mandible)</td><td>12</td><td>11</td><td>23</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>• titanium-zirconium implant (Roxolid, 3.3 mm in body diameter and 4.8 mm in platform diameter, Institut Straumann AG, Basel, Switzerland)
• commercially pure titanium implant (SLActive, 3.3 mm in body diameter and 4.8 mm in platform diameter, Institut Straumann AG, Basel, Switzerland)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>6 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>titanium-zirconium implant (TG)</td></tr>
<tr><td>• 비교치료법</td><td>commercially pure titanium implant (CG)</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>1y- 100% (42/42)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 1y /최소 : NR /최대: NR</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>Implant survival was defined as the implant being still in place at the</td></tr>
</table>

<table>
<tr><td></td><td></td><td>12-month follow-up.</td></tr>
<tr><td></td><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>
<table>
<tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr>
<tr><td>Implant survival rate</td><td>1y</td><td>40</td><td>42</td><td>95.2</td></tr>
<tr><td>- TG</td><td>1y</td><td>20</td><td>21</td><td>95.2</td></tr>
<tr><td>- CG</td><td>1y</td><td>20</td><td>21</td><td>95.2</td></tr>
<tr><td>소구치(Premolar)</td><td>1y</td><td>18</td><td>19</td><td>94.7</td></tr>
<tr><td>대구치(Molar)</td><td>1y</td><td>22</td><td>23</td><td>95.7</td></tr>
<tr><td>상악(Maxilla)</td><td>1y</td><td>18</td><td>19</td><td>94.7</td></tr>
<tr><td>하악(Mandible)</td><td>1y</td><td>22</td><td>23</td><td>95.7</td></tr>
</table>
</td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td></td><td>titanium-zirconium alloy and commercially pure titanium 으로 만든 좁은 직경의 임플란트가 턱 뒤쪽 부분의 단일 크라운을 지지하는 데 사용될 수 있음을 시사함</td></tr>
<tr><td>기타</td><td></td><td></td></tr>
<tr><td>- 재정지원</td><td></td><td>NR</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">56</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Bruyn (2013)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>벨기에</td></tr>
<tr><td>• 연구기관</td><td>다기관 (four different centers)</td></tr>
<tr><td>• 연구기간</td><td>NR</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>Cooper, L.F., Raes, F., Reside, G.J., Garriga, J.S., Tarrida, L.G., Wiltfang, J., Kern, M. & De Bruyn, H. (2010) Comparison of radiographic and clinical outcomes following immediate provisionalization of single-tooth dental implants placed in healed alveolar ridges and extraction sockets. International Journal of Oral and Maxillofacial Implants 25: 1222-1232 참고.</td></tr>
<tr><td>• 제외기준</td><td>Cooper, L.F., Raes, F., Reside, G.J., Garriga, J.S., Tarrida, L.G., Wiltfang, J., Kern, M. & De Bruyn, H. (2010) Comparison of radiographic and clinical outcomes following immediate provisionalization of single-tooth dental implants placed in healed alveolar ridges and extraction sockets. International Journal of Oral and Maxillofacial Implants 25: 1222-1232 참고.</td></tr>
<tr><td>• 표본수</td><td>113/113</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>extraction group 45±14
healed group 42±15</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>113</td><td>100</td></tr><tr><td>male</td><td>47</td><td>41.6</td></tr><tr><td>female</td><td>66</td><td>58.4</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td>NR</td></tr>
<tr><td>• 임플란트명</td><td>Osseospeed implants (Astra Tech AB, Mo¨ Indal, Sweden)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>extraction group- immediate
healed group- NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>8 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Extraction sited</td></tr>
<tr><td>• 비교치료법</td><td>Healed sited</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>89.4 % (101/113)</td></tr>
<tr><td>• 추적관찰기간</td><td>3y</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td></td><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>3y</td><td>109</td><td>113</td><td>96.5</td></tr><tr><td>- extraction sited</td><td>3y</td><td>52</td><td>55</td><td>94.5</td></tr><tr><td>- healed sited</td><td>3y</td><td>57</td><td>58</td><td>98.3</td></tr></table>
96.3%(103/1x07)</td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">수술 당일에 즉시 복원된 임플란트는 conventionally 설치하는 임플란트에 비해 임플란트 실패, 뼈 손실 및 얼굴 중앙부위의 연조직 감소 위험이 비슷함. 3년의 결과에서 경/연조직의 안정성을 보여줌.</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">사적지원
The study was supported by Astra Tech, Mo¨ Indal, Sweden, providing materials and funding.</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">57</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Cha (2013)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>한국</td></tr>
<tr><td>• 연구기관</td><td>단일기관 Department of Dentistry, Asan Medical Center.</td></tr>
<tr><td>• 연구기간</td><td>2006-2007</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>2006-2007 사이에 아산병원에서 MicrothreadTM OsseospeedTM* 40-mmdiameter implants 치료를 받은 환자</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>120/136</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>47.0 years (18.8-81.1)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>120</td><td>100</td></tr><tr><td>male</td><td>57</td><td>47.5</td></tr><tr><td>female</td><td>63</td><td>52.5</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>136</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>22</td><td>16.2</td></tr><tr><td>소구치(Premolar)</td><td>25</td><td>18.4</td></tr><tr><td>대구치(Molar)</td><td>89</td><td>65.4</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>70</td><td>51.5</td></tr><tr><td>하악(Mandible)</td><td>66</td><td>48.5</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>implant (MicroThreadTM OsseospeedTM, Astra Tech)</td></tr>
<tr><td>• 수술시기 (발치-수술)</td><td>〉 12 weeks</td></tr>
<tr><td>• 보철시기 (수술-보철)</td><td>NR</td></tr>
<tr><td>보철타입</td><td></td><td>cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>NA</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대: 5y</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>5y</td><td>124</td><td>136</td><td>91.2</td></tr><tr><td>male</td><td>5y</td><td>61</td><td>70</td><td>87</td></tr><tr><td>female</td><td>5y</td><td>63</td><td>66</td><td>95.2</td></tr><tr><td>전치(Anterior)</td><td>5y</td><td>22</td><td>22</td><td>100</td></tr><tr><td>소구치(Premolar)</td><td>5y</td><td>25</td><td>25</td><td>100</td></tr><tr><td>대구치(Molar)</td><td>5y</td><td>77</td><td>89</td><td>87.6</td></tr><tr><td>상악(Maxilla)</td><td>5y</td><td>66</td><td>70</td><td>94.3</td></tr><tr><td>하악(Mandible)</td><td>5y</td><td>58</td><td>66</td><td>87.6</td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td></td><td>NR</td></tr>
<tr><td>기타</td><td></td><td></td></tr>
<tr><td>- 재정지원</td><td></td><td>지원없음
Source of funding and conflict of interest; this article was prepared without any sources of institutional, private or corporate financial support, and there are no potential conflicts of interest.</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">58</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Cosyn (2013)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>벨기에</td></tr>
<tr><td>• 연구기관</td><td>NR</td></tr>
<tr><td>• 연구기간</td><td>2006-2007</td></tr>
<tr><td rowspan="11">연구대상</td><td>• 포함기준</td><td>단일 치아 임플란트를 받은 환자
• All surgical and restorative treatments performed by two experienced periodontists, respectively, prosthodontists at the Dental Clinic of the Free University in Brussels (VUB) or private practice;
• Single implant treatment in the anterior maxilla using one implant system (NobelReplace tapered TiUnite®, Nobel Biocare, Göteborg, Sweden);
• One of the following routine treatment modalities performed: standard implant treatment (SIT), immediate implant treatment (IIT), implant treatment in conjunction with guided bone regeneration (GBR), and implant treatment in grafted bone (BGR) as described in detail below;
• Natural teeth present both mesial and distal to the implant.</td></tr>
<tr><td>• 제외기준</td><td>• Vertical alveolar process deficiency;
• Submerged healing except following GBR;
• Connective tissue grafting;
• Papilla preservation flaps;
• Flapless surgery.</td></tr>
<tr><td>• 표본수</td><td>104/104</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>51(22-80)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>104</td><td>100</td></tr><tr><td>male</td><td>43</td><td>41.3</td></tr><tr><td>female</td><td>61</td><td>58.7</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>SIT</th><th>IIT</th><th>GBR</th><th>BGR</th><th>Total</th></tr><tr><td>total</td><td>44</td><td>28</td><td>18</td><td>14</td><td>104</td></tr><tr><td>위치 1</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>15</td><td>20</td><td>10</td><td>9</td><td>54</td></tr><tr><td>Cuspid</td><td>4</td><td>1</td><td>4</td><td>3</td><td>12</td></tr><tr><td>소구치(Premolar)</td><td>25</td><td>7</td><td>4</td><td>2</td><td>38</td></tr><tr><td>대구치(Molar)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>위치 2</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>44</td><td>28</td><td>18</td><td>14</td><td>104</td></tr><tr><td>하악(Mandible)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>NobelReplace tapered TiUnite® (Nobel Biocare, Göteborg, Sweden)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>SIT- 6 week
IIT- 3 hours
GBR- 6 weeks
BGR- 24+6 weeks</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>SIT- 12 week
IIT- 12-24 weeks
GBR- 12+few weeks
BGR- 12weeks</td></tr>
<tr><td>보철타입</td><td colspan="2">cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>standard implant treatment (SIT)
immediate implant treatment (IIT)
implant treatment in conjunction with guided bone regeneration (GBR)
implant treatment in grafted bone (BGR)</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>NA</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 30±8 m /최소 : 17m /최대: 41m</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
</table>

<table>
<tr><td></td><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table>
<tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr>
<tr><td>Implant survival rate</td><td>30m</td><td>97</td><td>104</td><td>93</td></tr>
<tr><td>SIT</td><td>30m</td><td>41</td><td>44</td><td>93.2</td></tr>
<tr><td>IIT</td><td>30m</td><td>26</td><td>28</td><td>92.9</td></tr>
<tr><td>GBR</td><td>30m</td><td>17</td><td>18</td><td>94.4</td></tr>
<tr><td>BGR</td><td>30m</td><td>13</td><td>14</td><td>92.9</td></tr>
</table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td></td><td>모든 치료 결과는 임상 및 방사선학적 관점에서 예측할 수 있었음. 그러나 고급 재건 수술, 특히 BGR은 합병증의 위험을 증가시키고 심미적으로 손상 시켰습니다. 복잡한 치료를 피하기 위해 치아 손실시 buccal bone defects 의 예방 및 최소한의 침습적 치료에 대한 연구가 필요.</td></tr>
<tr><td>기타</td><td></td><td></td></tr>
<tr><td>- 재정지원</td><td></td><td>공적지원
Conflict of interests and source of funding: The authors declare that they have no conflict of interests. The study was supported by the dental department of the Free University of Brussels (VUB).</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">59</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Cosyn_2013</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>벨기에</td></tr>
<tr><td>• 연구기관</td><td>단일기관</td></tr>
<tr><td>• 연구기간</td><td>2009.01-2010.04</td></tr>
<tr><td rowspan="9">연구대상</td><td>• 포함기준</td><td>• at least 18 years old;
• good oral hygiene defined as full-mouth plaque score 〈=25%
• presence of a single failing tooth in the anterior maxilla (15-25) with both neighboring teeth present;
• ideal soft tissue level/contour at the facial aspect of the failing tooth in perfect harmony with the surrounding teeth;
• thick gingival biotype as determined by De Rouck and colleagues
• adequate bone height apical to the alveolus of the failing tooth ()=5 mm) to ensure primary implant stability of at least 35 Ncm;
• signed informed consent.</td></tr>
<tr><td>• 제외기준</td><td>• systemic diseases; smoking;
• bruxism, lack of posterior occlusion;
• periodontal disease or history of periodontal disease;
• presence of active infection (pus, fistula) around the failing tooth;
• loss of the buccal bone crest after extraction of the failing tooth.</td></tr>
<tr><td>• 표본수</td><td>22</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>50 (27-74)</td></tr>
<tr><td>• 성</td><td><table><tr><td></td><td>N</td><td>%</td></tr><tr><td>total</td><td>22</td><td>100</td></tr><tr><td>male</td><td>12</td><td>54.5</td></tr><tr><td>female</td><td>10</td><td>45.5</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><td></td><td>N</td><td>%</td></tr><tr><td>total</td><td>22</td><td>100</td></tr><tr><td>위치 1</td><td>N</td><td>%</td></tr><tr><td>전치(Anterior)</td><td>17</td><td>77.3</td></tr><tr><td>cuspid</td><td>1</td><td>4.5</td></tr><tr><td>소구치(Premolar)</td><td>4</td><td>18.2</td></tr><tr><td>대구치(Molar)</td><td>0</td><td>0</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>22</td><td>100</td></tr><tr><td>하악(Mandible)</td><td>0</td><td>0</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>NobelActive®, Nobel Biocare, Göteborg, Sweden</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>immediate</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>24 weeks</td></tr>
<tr><td>보철타입</td><td colspan="2">cemented/screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>95.5% (21/22)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : /최소 : /최대:12m</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><td></td><td>시점</td><td>event</td><td>total</td><td>%</td></tr><tr><td>Implant survival rate</td><td>1y</td><td>21</td><td>21</td><td>100</td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
</table>

결론	immediate implant treatment (IIT) 이후 심미적 보존이 가능함. 그러나 이를 달성하기 위해서는 약 1/3의 환자에서 CTG가 필요할 수 있음. Major alveolar process remodeling은 추가 지료가 필요한 주된 이유임.
기타	
- 재정지원	사적지원 The authors declare that they have no conflicts of interest and wish to thank Nobel Biocare, Belgium, for their support by delivering part of the implants.

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">60</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Hartlev (2013)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>덴마크</td></tr>
<tr><td>• 연구기관</td><td>단일기관
Private Practice, Tinglev, Denmark Søren Ahlmann, CoDENT, Aarhus, Denmark</td></tr>
<tr><td>• 연구기간</td><td>2001-2009</td></tr>
<tr><td rowspan="10">연구대상</td><td>• 포함기준</td><td>incisor, canine, and premolar region에서 1개의 단일 치아 임플란트의 immediate placement and provisionalization 한 환자</td></tr>
<tr><td>• 제외기준</td><td>• Previous irradiation of the head and neck region.
• Previous chemotherapy.
• HIV-infection.
• Substance abuse.
• Autoimmune disease.
• Bone metabolic disease.
• Uncontrolled diabetes.
• Parafunction, bruxism, or clenching.
• Poor oral hygiene.
• Progressive periodontitis.
• Pregnancy.
• Breast-feeding.
• Immunosuppression.
• Marginal bone loss 〉1 mm buccally after tooth extraction.
• Acute infection related to the extracted tooth, including spontaneous pus and pus on probing.</td></tr>
<tr><td>• 표본수</td><td>55/55</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>43 (17-82)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>55</td><td>100</td></tr><tr><td>male</td><td>34</td><td>62</td></tr><tr><td>female</td><td>21</td><td>38</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>55</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>50</td><td>91</td></tr><tr><td>Canine</td><td>3</td><td>5</td></tr><tr><td>소구치(Premolar)</td><td>2</td><td>4</td></tr><tr><td>대구치(Molar)</td><td>0</td><td>0</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>53</td><td>96</td></tr><tr><td>하악(Mandible)</td><td>2</td><td>4</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>implant (Replace® Select Tapered Ti-Unite, Nobel Biocare, Go¨ teborg, Sweden)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>Definitive abutment and provisional crown: 2 hours</td></tr>
<tr><td>보철타입</td><td></td><td>cemented / screw</td></tr>
<tr><td>중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td></td><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>NA</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 33m /최소 : 11m /최대: 89m</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>• Implant survival: Implant failure was defined as implant mobility or removal of a stable implant due to progressive periimplant marginal bone loss or infection.
• Definitive crown survival: Failure of the definitive crown was defined as a loss of a mounted definitive crown irrespective of the reason.
• Overall treatment survival: Failure of the overall treatment was defined as a definitive crown that could not be placed due to implant failure or loss of the definitive crown irrespective of the reason.</td></tr>
</table>

	success	NR
결과	survival rate	<table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>33m</td><td>54</td><td>55</td><td>98</td></tr></table> One of the 55 initially placed implants was lost.
	success rate	NR
결론		두 방법 모두 임플란트 크라운과 임플란트의 높은 생존율을 보이고, 건강한 임플란트 주변 조직을 보여줌. 임시 크라운의 손실이 자주 발생함.
기타		
- 재정지원		사적지원 The study was partially supported by Nobel Biocare

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">61</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Hosseini (2013)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>덴마크</td></tr>
<tr><td>• 연구기관</td><td>단일기관
School of Dentistry in Copenhage</td></tr>
<tr><td>• 연구기간</td><td>2006-2008</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>단일 치아 대체가 필요한 환자</td></tr>
<tr><td>• 제외기준</td><td>contraindications for oral implant treatment (e.g., uncontrolled diabetes, metabolic bone disorders, history of
radiotherapy in head and neck, current chemotherapy,
or other diseases with an influence on bone healing)</td></tr>
<tr><td>• 표본수</td><td>59/98</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>27.9 ± 9.3 (18-50)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>59</td><td>100</td></tr><tr><td>male</td><td>24</td><td>40.7</td></tr><tr><td>female</td><td>35</td><td>59.3</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td>NR</td></tr>
<tr><td>• 임플란트명</td><td>implants (Astra Tech®, Mo¨ Indal, Sweden).</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>16-24 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>cement</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>all-ceramic</td></tr>
<tr><td>• 비교치료법</td><td>metal-ceramic</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>100% (59/59) (환자수)
100% (98/98) (임플란트)</td></tr>
<tr><td>• 추적관찰기간</td><td>median 37.1 months/ 3y</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td></td><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>3y</td><td>98</td><td>98</td><td>100</td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td></td><td>zirconia 와 metal abutments의 생물학적 결과는 비슷했음. All-ceramic crowns은 metal-ceramic crowns에 비해 더 나은 색상일치를 보여주었으나, marginal discrepancy의 빈도가 높았음. 일반저으로 환자들은 두 수복물간의 심미적 결과에서 차이를 발견하지 못함.</td></tr>
<tr><td>기타</td><td></td><td></td></tr>
<tr><td>- 재정지원</td><td></td><td>사적지원
The authors express special thanks to Astra Tech®, Sweden for financial support and delivery of abutments and are grateful for financial support of DSOI (Danish Society for Oral Implantology) and the KOF/Calcin Foundation of The Danish Dental Association (Tandlaegeforeningen) to this study. We appreciate Associate Professor Lene Theil Skovgaard at the Department of Biostatistics for help with the statistical analyses presented in this study. The authors declare no conflict of interest.</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">62</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Lops (2013)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>이탈리아</td></tr>
<tr><td>• 연구기관</td><td>다기관
Dental Clinic of Biomedical Sciences Institute, St Paul Hospital, University of Milan, Italy, and at the Dental Clinic, Department of Medicine, Surgery and Dentistry, University of Padova, Italy.</td></tr>
<tr><td>• 연구기간</td><td>2004.02-2005.12</td></tr>
<tr><td rowspan="12">연구대상</td><td>• 포함기준</td><td>후치부위에서 단일 치아 수복이 필요한 환자
• Single-tooth gap in the posterior maxilla or mandible (from first premolar posterior)
• Absence of local inflammation
• Absence of oral mucosal disease
• Adequate oral hygiene
• Recovery time of at least 6 months for patients who underwent tooth extractions in the areas to be rehabilitated with implants
• Adequate bone volume at the implant site (enough for placement of an implant at least 3.5 mm in diameter and 8 mm in length) evaluated by intraoral periapical radiographs and clinical evaluation
• Presence of a natural tooth contralateral to the implant-supported restoration
• Natural teeth without prosthetic restoration opposite to the ST prostheses</td></tr>
<tr><td>• 제외기준</td><td>• Patients with systemic diseases (such as heart, coagulation,
• and leukocyte diseases or metabolic disorders)
• History of radiation therapy in the head and neck region
• Current treatment with steroids
• Neurologic or psychiatric disability that could interfere with good oral hygiene
• Immunocompromised status, including infection with human immunodeficiency virus
• Severe clenching or bruxism
• Smoking habit (more than 15 cigarettes per day)
• Drug or alcohol abuse
• Inadequate compliance</td></tr>
<tr><td>• 표본수</td><td>85/85</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>54 (35-67)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>85</td><td>100</td></tr><tr><td>male</td><td>38</td><td>44.7</td></tr><tr><td>female</td><td>47</td><td>55.3</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>81</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>0</td><td>0</td></tr><tr><td>소구치(Premolar)</td><td>46</td><td>56.8</td></tr><tr><td>대구치(Molar)</td><td>35</td><td>43.2</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>41</td><td>51</td></tr><tr><td>하악(Mandible)</td><td>40</td><td>49</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>implants (Osseospeed, Astra Tech)</td></tr>
<tr><td>• 수술시기 (발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기 (수술-보철)</td><td>11 week</td></tr>
<tr><td>보철타입</td><td></td><td>cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Zr abutment</td></tr>
<tr><td>• 비교치료법</td><td>Ti abutment</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>95.3% (81/85)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대: 5y</td></tr>
</table>

<table>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>prosthetic cumulative survival rate</td><td>5y</td><td>81</td><td>81</td><td>100</td></tr></table>No failures occurred due to fracture of an abutment or loosening of an abutment screw,.</td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">후치 부위에서 Zr abutment의 중기 생존율은 Ti abutment와 비슷함. 이 결과를 확인하려면 장기적인 평가가 필요함.</td></tr>
<tr><td colspan="3">기타</td></tr>
<tr><td>- 재정지원</td><td colspan="2">NR</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">63</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Zembic_2013</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>스위스</td></tr>
<tr><td>• 연구기관</td><td>Sailer et al. 2009c 참조</td></tr>
<tr><td>• 연구기간</td><td>Sailer et al. 2009c 참조</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>Sailer, I., Zembic, A., Jung, R.E., Siegenthaler, D., Holderegger, C. & Ha¨mmerle, C.H.F. (2009c). Randomized controlled clinical trial of customized zirconia and titanium implant abutments for posterior single-tooth implant reconstructions: preliminary results at 1-year of function. Clinical Oral Implants Research 20: 219–225. 참고</td></tr>
<tr><td>• 제외기준</td><td>Sailer et al. 2009c 참조</td></tr>
<tr><td>• 표본수</td><td>22/40</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>41.3±18.0 years</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>22</td><td>100</td></tr><tr><td>male</td><td>8</td><td>36.4</td></tr><tr><td>female</td><td>14</td><td>63.6</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>Zr</th><th>Ti</th><th>Total</th></tr><tr><td>total</td><td>18</td><td>10</td><td>28</td></tr><tr><td>위치 1</td><td></td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>0</td><td>0</td><td>0</td></tr><tr><td>canine</td><td>2</td><td>2</td><td>3</td></tr><tr><td>소구치(Premolar)</td><td>11</td><td>8</td><td>19</td></tr><tr><td>대구치(Molar)</td><td>5</td><td>0</td><td>5</td></tr><tr><td>위치 2</td><td></td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>7</td><td>4</td><td>11</td></tr><tr><td>하악(Mandible)</td><td>11</td><td>6</td><td>17</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>NR</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>Sailer et al. 2009c 참조</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>16-24 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>customized zirconia abutments (Procera, Nobel Biocare AB, Carolinsk, Sweden),</td></tr>
<tr><td>• 비교치료법</td><td>customized titanium abutments (Procera)</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>임플란트기준 70%(28/40), 환자기준 90.1% (20/22)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 5.6y /최소 : 4.5y /최대: 6.3y</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>5y</td><td>25</td><td>28</td><td>89.3</td></tr><tr><td>test group</td><td>5y</td><td>16</td><td>18</td><td>88.9</td></tr><tr><td>control group</td><td>5y</td><td>9</td><td>10</td><td>90</td></tr><tr><td>abutment and the crown survival</td><td>5y</td><td>28</td><td>28</td><td>100</td></tr><tr><td>test group</td><td>5y</td><td>18</td><td>18</td><td>100</td></tr><tr><td>control group</td><td>5y</td><td>10</td><td>10</td><td>100</td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">두 개 abutment의 생존율, 기술 및 생물학적 합병증 발생률ㅇ간에 통계적 또는 임상적인 차이는 없었음.</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">사적지원
The authors thank Dr Giorgio Menghini and Dr Malgorzata Roos for their support with the statistical analysis. Nobel Biocare AB, Gothenburg, Sweden, supplied the abutments for this study.</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">64</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Bergenblock (2012)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>스웨덴</td></tr>
<tr><td>• 연구기관</td><td>단일기관 (Mölndal Hospital, Västra Götaland, Sweden)</td></tr>
<tr><td>• 연구기간</td><td>1989-1991</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>17 ~ 19 년 전에 CeraOne single-implant restorations 치료받은 환자</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>57/65</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>31.9±10.66 (15-57)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>57</td><td>100</td></tr><tr><td>male</td><td>32</td><td>56.1</td></tr><tr><td>female</td><td>25</td><td>43.8</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>65</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>-</td><td>-</td></tr><tr><td>소구치(Premolar)</td><td>-</td><td>-</td></tr><tr><td>대구치(Molar)</td><td>-</td><td>-</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>62</td><td>95.4</td></tr><tr><td>하악(Mandible)</td><td>3</td><td>4.6</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>CeraOne™™ (Nobel Biocare AB, Gothenburg, Sweden)</td></tr>
<tr><td>• 수술시기 (발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기 (수술-보철)</td><td>NR</td></tr>
<tr><td>보철타입</td><td colspan="2">cemented</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트(external)</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>patient 기준: 82.5% (47/57) - 18y
implant 기준:80% (52/65) -18y</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 18y 최소 17y 최대 19 y</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>Survival rates were calculated for the original crown restorations still in function at the final examination. Crowns that had been replaced were recorded as failures, but the implants were still followed up and recorded as successful if still in function supporting a new crown restoration.</td></tr>
<tr><td>success</td><td>Bone loss(External), Prothesis, Soft tissue complication 기준</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>Two implants failed,<table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>누적%</th></tr><tr><td>Total</td><td>18y</td><td>39</td><td>41</td><td>96.2</td></tr></table>One patient lost one implant during the first year in function, and the other patient lost one of two implants as a result of implant fracture after 9 years in function.</td></tr>
<tr><td>success rate</td><td>- bone loss 기준<table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>누적%</th></tr><tr><td>bone loss 0~1.2 (ref 1.0mm)</td><td>1y</td><td>40</td><td>45</td><td>88.9</td></tr><tr><td>bone loss 0~1.8 (ref 1.8mm)</td><td>5y</td><td>40</td><td>43</td><td>93.0</td></tr><tr><td>bone loss <=2.4 (ref 4.4mm)</td><td>18y</td><td>40</td><td>41</td><td>97.6</td></tr></table></td></tr>
<tr><td>결론</td><td colspan="2">단일 임플란트 수복물을 18년 동안 장기추적한 결과 임플란트 실패가 거의없고 뼈 손실이 최소화된 결과를 제시함.</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">NR</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">65</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Gde (2012)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>브라질</td></tr>
<tr><td>• 연구기관</td><td>다기관
three clinical centers</td></tr>
<tr><td>• 연구기간</td><td>1997-2007</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>1997-2007년사이에 단일 임플란트 치료를 받은 환자
For a patient to be included, he or she had to have been rehabilitated with single implants with an external connection, the definitive restorations had to be functioning and in place for a minimum of 2 years, implant placement should have been done in a two-stage technique and data on study variables had to be available. No patients were excluded on the basis of systemic disease if it did not contraindicate surgery, or for age, gender, race, smoking habit, or a history of chronic/aggressive periodontal disease or bone regeneration procedures.</td></tr>
<tr><td>• 제외기준</td><td>contraindicate surgery</td></tr>
<tr><td>• 표본수</td><td>44/73</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>48 years (range, 24 to 72 years)<table><tr><td></td><td>N</td><td>%</td></tr><tr><td>total</td><td>44</td><td>100</td></tr><tr><td>〈40</td><td>5</td><td>11.4</td></tr><tr><td>40-49</td><td>20</td><td>45.5</td></tr><tr><td>50-59</td><td>15</td><td>34.1</td></tr><tr><td>〉60</td><td>4</td><td>9.1</td></tr></table></td></tr>
<tr><td>• 성</td><td><table><tr><td></td><td>N</td><td>%</td></tr><tr><td>total</td><td>44</td><td>100</td></tr><tr><td>male</td><td>12</td><td>31.8</td></tr><tr><td>female</td><td>32</td><td>68.2</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><td></td><td>N</td><td>%</td></tr><tr><td>total</td><td>71</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>21</td><td>29.6</td></tr><tr><td>Canine</td><td>2</td><td>2.8</td></tr><tr><td>소구치(Premolar)</td><td>21</td><td>29.6</td></tr><tr><td>대구치(Molar)</td><td>27</td><td>38.0</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>41</td><td>57.7</td></tr><tr><td>하악(Mandible)</td><td>30</td><td>42.3</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>NR</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>Branemark P-I, Zarb GA, Albrektsson T (eds). Tissue-Integrated Prostheses: Osseointegration in Clinical Dentistry. Chicago: Quintessence, 1985. 참조</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>18~28 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>5y: 100.0 (73/73)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균: 60 months/최소: 2y/ 최대: 13y</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td></td><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>5y 95.8%(68/71)</td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">이 연구에 사용 된 임플란트 및 관련 보철 구조는 우수한 생존율을 보여주었음. 그러나 titanium screws and UCLA cast abutments 관련된 보철 합병증 빈도는</td></tr>
</table>

	높았음.
기타	
	사적지원
- 재정지원	The authors are thankful to ILAPEO (Latin American Institute of Dental Research and Education, Brazil) for the evaluation form used in this research. This project was supported by FAPEMIG (Fundacao de Amparo a Pesquisa do Estado de Minas Gerais, Brazil).

연번(Ref ID)	66	
1저자(출판연도)	Gotfredsen (2012)	
연구방법	• 연구설계	전향적 환자군 연구
	• 연구국가	스웨덴
	• 연구기관	단일기관 Department of Oral Rehabilitation, Faculty of Health Science, University of Copenhagen
	• 연구기간	Gotfredsen K. A 5-year prospective study of single-tooth replacements supported by the Astra Tech implant. Clin Implant Dent Relat Res 2004; 6:1-8. 참고
연구대상	• 포함기준	상악에 단일 치아 결손 환자
	• 제외기준	NR
	• 표본수	20/20
	• 표본수집방법	NR
	• 연령	A군: 35 years (range 19-59) B군: 31 years (range 18-57)
	• 성	<table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>20</td><td>100</td></tr><tr><td>male</td><td>10</td><td>50</td></tr><tr><td>female</td><td>10</td><td>50</td></tr></table>
	• 치아 위치	<table><tr><th></th><th>ㅜ</th><th>%</th></tr><tr><td>total</td><td>20</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>16</td><td>80</td></tr><tr><td>canines</td><td>2</td><td>10</td></tr><tr><td>소구치(Premolar)</td><td>2</td><td>10</td></tr><tr><td>대구치(Molar)</td><td>0</td><td>0</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>20</td><td>100</td></tr><tr><td>하악(Mandible)</td><td>0</td><td>0</td></tr></table>
	• 임플란트명	4.5 mmdiameter Astra Tech ST (Astra Tech AB, Mölndal, Sweden) implant
	• 수술시기 (발치-수술)	A- early (4weeks) B- delayed (12weeks)
	• 보철시기 (수술-보철)	NR
보철타입		cemented / screw
중재법 및 비교치료법	• 중재법	early implant placement (group A)
	• 비교치료법	delayed placement group (group B)
추적관찰	• Recall rate	10y 100% (20/20) 환자 10y 100% (20/20) 임플란트
	• 추적관찰기간	최대: 10y
결과 평가기준	survival	임플란트 유지 여부에 따라 구분
	success	NR
결과	survival rate	<table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>10y</td><td>20</td><td>20</td><td>100</td></tr></table>
	success rate	NR
결론		10년후 임플란트 생존율 100%, 크라운 생존율 90%를 보여주었고, average marginal bone level change은 1mm미만이었으면 임플란트 식립시기에 따른 차이가 없었음. 환자 만족도는 시간이 지남에 따라 감소함
기타		
- 재정지원		사적지원 The author is grateful to Professor Emeritus Erik Hjörting-Hansen and Associate Professor Flemming Harder for their help and involvement in the project. Thanks are given to Astra Tech AB, Sweden for delivery of the implants and implant components.

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">67</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Mangano (2012)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>이탈리아</td></tr>
<tr><td>• 연구기관</td><td>단일기관
one clinical centre (private practice)</td></tr>
<tr><td>• 연구기간</td><td>2006.12-2009.06</td></tr>
<tr><td rowspan="10">연구대상</td><td>• 포함기준</td><td>Inclusion criteria were natural teeth present both mesial and distal to the implant, presence of four bony walls of the alveolus, adequate bone height and width to place an implant of at least 3.3 mm in diameter and 10.0 mm in length. Implant treatments including hard/soft tissue grafting before implant placement and periodontally compromised patients were excluded too. All patients read and signed a written consent form for immediate implant placement.</td></tr>
<tr><td>• 제외기준</td><td>Exclusion criteria were uncontrolled diabetes; poor oral hygiene, active periodontal infections, bruxism, heavy smoking habit (more than 15 cigarettes per day); presence of dehiscence or fenestration of the residual bony walls; presence of a thin-scalloped gingival biotype (determined by the transparency of a periodontal probe through the gingival margin while probing the buccal sulcus of the upper central incisor) (De Rouck et al. 2009).</td></tr>
<tr><td>• 표본수</td><td>26/26</td></tr>
<tr><td>• 표본수집방법</td><td>연속적/비연속적
(제시하지 않은 것은 NR)</td></tr>
<tr><td>• 연령</td><td>48.7 (20-62)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>26</td><td>100</td></tr><tr><td>male</td><td>18</td><td>69.2</td></tr><tr><td>female</td><td>8</td><td>30.8</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>26</td><td></td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>21</td><td>80.8</td></tr><tr><td>소구치(Premolar)</td><td>5</td><td>19.2</td></tr><tr><td>대구치(Molar)</td><td>0</td><td>0</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>26</td><td>100</td></tr><tr><td>하악(Mandible)</td><td>0</td><td>0</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>Morse taper connection implant (Leone Implant SystemR, Florence, Italy)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>immediate</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>12 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>cemented</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>NA</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대: 2y</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>2y 100% (26/26)
No implants were lost.</td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">전방 상악에 단일 치아 모스 테이퍼 연결 임플란트를 즉시 배치하는 것은 미적 관점에서 성공적인 편이나 추가 연구가 필요함</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">지원없음</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">68</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Meloni (2012)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>이탈리아</td></tr>
<tr><td>• 연구기관</td><td>다기관
three different centres (Surgical Microsurgical Medicine Department, University of Sassari and two different private offices)</td></tr>
<tr><td>• 연구기간</td><td>2009.01-2011.04</td></tr>
<tr><td rowspan="10">연구대상</td><td>• 포함기준</td><td>• missing bilateral mandibular first molars
• stable interocclusal contacts
• ≥8 years of age
• provided written informed consent
• residual bone height ≥0 mm
• residual bone thickness ≥ mm with at least 5 mm of keratinised gingiva crestally.</td></tr>
<tr><td>• 제외기준</td><td>• general contraindications to implant surgery
• lack of occluding dentition in the area intended for immediate loading
• periodontitis
• bruxism
• immunosuppression
• previous history of irradiation of the head and neck area
• uncontrolled diabetes
• heavy smoker (〉10 cigarettes/day)
• poor oral hygiene
• current or past treatment with bisphosphonates
• substance abuse
• psychiatric disorder
• inability to complete follow-up ≥ year
• requirement for bone augmentation (bone graft and membrane)
• pregnancy or lactation
• implant insertion torque less than 35 Ncm</td></tr>
<tr><td>• 표본수</td><td>20/40</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>46 (28-70)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>20</td><td>100</td></tr><tr><td>male</td><td>8</td><td>40</td></tr><tr><td>female</td><td>12</td><td>60</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><td></td></tr><tr><td>total</td></tr><tr><td>위치 1</td></tr><tr><td>전치(Anterior)</td></tr><tr><td>소구치(Premolar)</td></tr><tr><td>대구치(Molar)</td></tr><tr><td>위치 2</td></tr><tr><td>상악(Maxilla)</td></tr><tr><td>하악(Mandible)</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>tapered implants with an anodised surface (Nobel Replace Tapered Groovy; Nobel Biocare, Goteborg, Sweden)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>• immediate non-occlusal loading
• delayed implant loading</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>3-4 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>immediate loading</td></tr>
<tr><td>• 비교치료법</td><td>delayed loading</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>1y 100% (20/20)
100% (40/40)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : NR /최소 : NR /최대: 1y</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
</table>

<table>
<tr><td></td><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>1y</td><td>40</td><td>40</td><td>100</td></tr></table>-The removal of implants was dictated by instability, progressive marginal bone loss, infection or implant fracture.
-No implant mobility, infection or implant fracture occurred. All implants were stable at the end of the study.</td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td></td><td>단일 하악 어금니 부위에서 임플란트의 즉각적인 로딩과 지연된 로딩의 임상 결과가 비슷하다는 가설을 입증함</td></tr>
<tr><td>기타</td><td></td><td></td></tr>
<tr><td>- 재정지원</td><td></td><td>사적지원
This study was partially supported by Nobel Biocare (grant 2007-646).</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">69</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Oyama (2012)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>미국</td></tr>
<tr><td>• 연구기관</td><td>단일기관
the Center for Implant Dentistry, Loma Linda University School of Dentistry</td></tr>
<tr><td>• 연구기간</td><td>2005.08-2007.08</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>• Age at least 18 years and ability to read and sign an informed consent document
• Medical history that would not potentially complicate the outcome of the study
• Good oral hygiene
• Single missing maxillary lateral incisor or mandibular incisor with a mesiodistal space of ≤ 6.0 mm that was either congenitally missing or had healed for at least 2 months following extraction; presence of adjacent natural teeth (Figs 1a and 1b)
• Adequate bone volume to accommodate a 3.0-mm diameter implant with a length of at least 11 mm
• Presence of opposing dentition (natural teeth or fixed restoration)</td></tr>
<tr><td>• 제외기준</td><td>• A medical history that might complicate the outcome of the study, such as alcohol or drug dependency, history of smoking,20 poor health or any other medical, physical, or psychologic reason that might affect the surgical procedure or subsequent prosthodontic treatment and required follow-up treatment
• Dental history of bruxism,21 parafunctional habit, and/or lack of stable posterior occlusion
• Absence of primary implant stability during surgery</td></tr>
<tr><td>• 표본수</td><td>13/17</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>32.9 (18-84)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>13</td><td>100</td></tr><tr><td>male</td><td>7</td><td>53.8</td></tr><tr><td>female</td><td>6</td><td>46.2</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>17</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>17</td><td>100</td></tr><tr><td>소구치(Premolar)</td><td>0</td><td>0</td></tr><tr><td>대구치(Molar)</td><td>0</td><td>0</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>9</td><td>52.9</td></tr><tr><td>하악(Mandible)</td><td>8</td><td>47.1</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>3.0-mm diameter threadedgrit-blasted thermal acid-etched implant (Xive S, Dentsply)</td></tr>
<tr><td>• 수술시기 (발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기 (수술-보철)</td><td>12 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>3.0-mm diameter 임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>NA</td></tr>
<tr><td>• 추적관찰기간</td><td>NR</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td>결과</td><td>survival rate</td><td>1y : 100% (17/17)

All complications were resolved and did not seem to have a detrimental</td></tr>
</table>

		effect on the outcome of treatment.
	success rate	NR
결론		이 1 년 전향적 연구는 단일 결손 된 상악 및 하악 절치를 대체하는 즉시 임시 3.0mm 직경의 임플란트를 사용했을 때 좋은 임플란트 성공률과 임플란트 주변 조직 반응을 보임. 임시 단계의 보철 합병증은 흔했지만 추가 결과없이 쉽게 해결됨.
기타		
- 재정지원		사적지원 The authors would like to express appreciation to Dentsply Friadent Ceramed for partially supporting this study.

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">70</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Schneider (2012)</td></tr>
<tr><td rowspan="3">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>스위스</td></tr>
<tr><td>• 연구기관</td><td>단일기관
the Clinic of Fixed and Removable Prosthodontics and Dental Material Science at the University of Zurich,</td></tr>
<tr><td></td><td>• 연구기간</td><td>1994-2004</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>patients treated at the Clinic of Fixed and Removable Prosthodontics
• one or more implant(s) in the posterior maxilla or mandible
• these implants supporting single crown restorations
• at least 5 years between insertion of the reconstruction and the follow-up examination.</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>70/100</td></tr>
<tr><td>• 표본수집방법</td><td>연속적
- all patients</td></tr>
<tr><td>• 연령</td><td>50.7 years [range 19.8--76.6 years</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>70</td><td>100</td></tr><tr><td>male</td><td>27</td><td>37</td></tr><tr><td>female</td><td>43</td><td>63</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>100</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>0</td><td>0</td></tr><tr><td>소구치(Premolar)</td><td>49</td><td>49</td></tr><tr><td>대구치(Molar)</td><td>51</td><td>51</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>-</td><td>-</td></tr><tr><td>하악(Mandible)</td><td>-</td><td>-</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>• two-piece implants (Bra°nemark, Nobel Biocaret, Gothenburg, Sweden)
• one-piece implants (Straumann Standard or Standard Plus, Institut Straumann AG, Basel, Switzerland)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>NR</td></tr>
<tr><td>보철타입</td><td></td><td>cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트(mixed)</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>NA</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 6.2y /최소 : 4.73y /최대: 11.7y</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td></td><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>During the follow-up period, 6 (6%) implants were lost due to peri-implantitis in four patients after 1.1, 4.6, 5, 5.7 and 9.2 years in function
<table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>5y</td><td>67</td><td>70</td><td>95.7</td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
</table>

결론	c/i ratiosms 테스트된 범위 내에서 턱의 뒤쪽부분에서 단일 크라운 수복물로 지지하는 임플란트의 임상 성능에 영향을 미치지 않음
기타	
- 재정지원	언급없음

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">71</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Schwarz (2012)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>독일</td></tr>
<tr><td>• 연구기관</td><td>단일기관
the Department of Prosthodontics, University of Heidelberg</td></tr>
<tr><td>• 연구기간</td><td>2002.06-2010.01</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>presence of a tooth gap to be restored by implant placement, receiving both implants and single crown or FDP at the Department of Prosthodontics, attending at least one follow-up examination after fixing the suprastructure, and signing the informed consent form for documentation.</td></tr>
<tr><td>• 제외기준</td><td>rejection of participation in the study or receiving the implant or the suprastructure outside the Department of Prosthodontics. The number of such patients was not documented explicitly, however. A total of eight patients who did not attend follow-ups after fixing of the suprastructure were also excluded from this analysis.</td></tr>
<tr><td>• 표본수</td><td>241/398</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>57.3±12.3</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>241</td><td>100</td></tr><tr><td>male</td><td>117</td><td>48.5</td></tr><tr><td>female</td><td>124</td><td>51.5</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>398</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>50</td><td>13.1</td></tr><tr><td>Posterior</td><td>348</td><td>86.9</td></tr><tr><td>소구치(Premolar)</td><td></td><td></td></tr><tr><td>대구치(Molar)</td><td></td><td></td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>205</td><td>51.5</td></tr><tr><td>하악(Mandible)</td><td>193</td><td>48.5</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>NR</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>NR</td></tr>
<tr><td>보철타입</td><td colspan="2">cemented</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>FDPs</td></tr>
<tr><td>• 비교치료법</td><td>Single Crowns</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>NA</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 2.95±1.39y /최소 : NR /최대: 6.9y</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td></td><td>success</td><td>NR</td></tr>
<tr><td>결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>6.9y</td><td>395</td><td>398</td><td>99.2</td></tr><tr><td>- single crowns</td><td>6.9y</td><td>231</td><td>232</td><td>99.6</td></tr><tr><td>- FDPs</td><td>6.9y</td><td>164</td><td>166</td><td>99.3</td></tr></table>
During the implant observation period of up to 6.9 years (mean 2.95 years; SD 1.39) three implants with clinical signs of periimplantitis were lost in three patients (one single crown*, two FDPs), resulting in</td></tr>
</table>

		implant survival of 99.6% for the single crowns* and 99.3% for all FDPs
	success rate	NR
결론		single crowns 과 Fixed Dental Prostheses (FDPs)에 대한 반영구 및 영구적 고정방식은 모두 높은 생존율을 보임.
기타		
- 재정지원		NR We thank Ian Davies, copy editor, for language revision.

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">72</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Zembic (2012)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>스위스, 덴마크, 포르투갈, 독일</td></tr>
<tr><td>• 연구기관</td><td>다기관
five centers in Europe.</td></tr>
<tr><td>• 연구기간</td><td>NR</td></tr>
<tr><td rowspan="10">연구대상</td><td>• 포함기준</td><td>• No systemic disease.
• Good oral hygiene.
• Stable occlusion.
• Sufficient bone height for the placement of
• implants with a minimum length of 13mm.
• Insertion torque of 〉35Ncm.
• Smokers and non-smokers.
• Healed sites and immediate extraction sites.
• Sites with and without previous bone augmentation.</td></tr>
<tr><td>• 제외기준</td><td>• Bruxism.
• Chronic bone disease.
• Previous or present tumors at the implant site.
• Infection at the implant site.
• Previous or present irradiation of the head and neck region.
• An implant angulation 〉10 from the crown axis.
• Non-compliant patients.
• Patients not able to provide informed consent.</td></tr>
<tr><td>• 표본수</td><td>47/57</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>31 (17-76)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>47</td><td>100</td></tr><tr><td>male</td><td>21</td><td>44.7</td></tr><tr><td>female</td><td>26</td><td>55.3</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>57</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>57</td><td>100</td></tr><tr><td>소구치(Premolar)</td><td>0</td><td>0</td></tr><tr><td>대구치(Molar)</td><td>0</td><td>0</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>30</td><td>52.6</td></tr><tr><td>하악(Mandible)</td><td>27</td><td>47.4</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>implants (NobelDirects 3.0, Nobel Biocare AB)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>Parel & Schow 2005 참고</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>Parel & Schow 2005 참고</td></tr>
<tr><td>보철타입</td><td></td><td>cemented</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>환자수기준 93.6% (44/47)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 12.8m /최소 : 9.8m /최대: 20.8m</td></tr>
<tr><td>결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td></td><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>1y</td><td>56</td><td>57</td><td>98.2</td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">본 연구에서는 높은 1년 임플란트 생존율이 관찰됨. 그러나 과도한 임플란트 주변 연골 손실은 향후 관련 연구결과로 추가 확인이 되기 까지 본 임플란트를 주의해</td></tr>
</table>

	서 사용해야 함을 시사함.
기타	
- 재정지원	사적지원 The authors wish to thank Professor, Odont Dr Kerstin Grondahl, University of Gothenburg, Sweden, for the radiographic analysis, Asa Andersson for the administrative support, Dr Daniel Thoma, University of Zurich, Switzerland, for data management, and Dr Roland Glauser, private practice Zurich, Switzerland, for implant placement. The study was partially supported by a research grant from Nobel Biocare AB, Gothenburg, Sweden.

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">73</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Visser (2011)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>네덜란드</td></tr>
<tr><td>• 연구기관</td><td>다기관
Department of Oral and Maxillofacial Surgery and Maxillofacial Prosthodontics of the University Medical Center Groningen, the Netherlands, and to the Department of Oral and Maxillofacial Surgery of the Nij Smellinghe Christian Hospital in Drachten, the Netherlands</td></tr>
<tr><td>• 연구기간</td><td>1993-2003</td></tr>
<tr><td rowspan="11">연구대상</td><td>• 포함기준</td><td>• need for an implant supported dental crown to replace a maxillary lost tooth at the location of an incisor, cuspid, or first bicuspid;
• single tooth diastema as a maximum;
• presence of a horizontal bone deficiency with an anatomy of local bone responding to a class 4 according to Misch and Judy31, making a buccopalatinal local ridge augmentation necessary to obtain sufficient bone volume for reliable placement and sufficient initial stability of an endosseous dental implant;
• sufficient occlusal and mesio-distal dimensions for insertion of one implant with a functional prosthetic restoration;
• good oral hygiene and a healthy periodontal situation (see exclusion criteria) at the start of the treatment.</td></tr>
<tr><td>• 제외기준</td><td>• presence of clinical active periodontal disease as expressed by the presence of periodontal pockets 3 than 4 mm, gingival bleeding 3 class 2 of modified bleeding index,32 edema, glazing, and redness;
• presence of an acute inflammatory oral disease;
• smoking;
• diabetes;
• a history of pre-prosthetic or implant surgery at the same site as the planned augmentation and implantation.
• a history of radiotherapy in the head and neck region or current chemotherapy;
• disability (mental and/or physical) to maintain basic oral hygiene procedures.</td></tr>
<tr><td>• 표본수</td><td>93/93</td></tr>
<tr><td>• 표본수집방법</td><td>연속적/비연속적
(제시하지 않은 것은 NR)</td></tr>
<tr><td>• 연령</td><td>33±13 years; median 31, (18-63)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>93</td><td>100</td></tr><tr><td>male</td><td>44</td><td>47.3</td></tr><tr><td>female</td><td>49</td><td>52.7</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><td></td></tr><tr><td>total</td></tr><tr><td>위치 1</td></tr><tr><td>전치(Anterior)</td></tr><tr><td>소구치(Premolar)</td></tr><tr><td>대구치(Molar)</td></tr><tr><td>위치 2</td></tr><tr><td>상악(Maxilla)</td></tr><tr><td>하악(Mandible)</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>ITI-EstheticPlus dental implants, Institut Straumann AG, Waldenburg, Switzerland</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>Group1/2 - 12 weeks
Group 3- 24 weeks</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>4 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>Bio-Oss® spongiosa granules (0.25-.0 mm, Geistlich) in combination with a Bio-Gide® GBR membrane (group III, n = 31).</td></tr>
<tr><td>• 비교치료법</td><td>• chin bone (group I, n = 31);
• chin bone in combination with a resorbable guided bone regeneration</td></tr>
</table>

		(GBR) membrane (Bio-Gide Geistlich,Wolhusen, Switzerland; group II, n = 31);
추적관찰	• Recall rate	98.9% (92/93)
	• 추적관찰기간	평균 : NR /최소 :NR /최대:5y
결과 평가기준	survival	임플란트 유지 여부에 따라 구분
	success	NR
결과	**survival rate**	5y 98.9%(92/93)
	success rate	NR
결론		local bone augmentation후 상악 심미 부위에 임플란트 식립하는 것은 정기적 예방검사, 정기적 구강 위생 관리와 8-9명 중 한명씩 새로운 크라운 제작 외에 특별한 사후관리가 필요하지 않은 안전하고 신뢰할 수 있는 치료 옵션임. augmentation을 위해 사용된 방법은 환자의 사후관리 요구와 무관했음.
기타		
- 재정지원		NR

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">74</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Hosseini (2011)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>RCT</td></tr>
<tr><td>• 연구국가</td><td>덴마크</td></tr>
<tr><td>• 연구기관</td><td>다기관
• Department of Oral and Maxillofacial Surgery, Glostrup University Hospital (Copenhagen, Denmark)
• School of Dentistry in Copenhagen for ISSCs</td></tr>
<tr><td>• 연구기간</td><td>2008.01-2009.12</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>소구치부위에 tooth agenesis이 있는 환자</td></tr>
<tr><td>• 제외기준</td><td>contraindications for oral implant treatment- uncontrolled diabetes, metabolic bone disorders, history of radiotherapy in the head and neck, current chemotherapy, or other diseases with an influence on bone healing</td></tr>
<tr><td>• 표본수</td><td>36/75</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>28.1±9.2 (19-57)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>36</td><td>100</td></tr><tr><td>male</td><td>18</td><td>50</td></tr><tr><td>female</td><td>18</td><td>50</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>AC</th><th>MC</th><th>Total</th></tr><tr><td>total</td><td>38</td><td>37</td><td>75</td></tr><tr><td>위치 1</td><td></td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>0</td><td>0</td><td>0</td></tr><tr><td>소구치(Premolar)</td><td>38</td><td>37</td><td>75</td></tr><tr><td>대구치(Molar)</td><td>0</td><td>0</td><td>0</td></tr><tr><td>위치 2</td><td></td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>19</td><td>21</td><td>40</td></tr><tr><td>하악(Mandible)</td><td>19</td><td>16</td><td>35</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>Astra TechR (Molndal, Sweden)</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>16-24 weeks</td></tr>
<tr><td>보철타입</td><td></td><td>cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>AC(All-Ceramic) crown</td></tr>
<tr><td>• 비교치료법</td><td>MC(Metal-Ceramic) crown</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>1y : 100% (36/36) 환자
1y : 100% (75/75) 임플란트</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 13.5 months /최소 : 11m /최대: 20m</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>NR</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td>결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate (</td><td>1y</td><td>75</td><td>75</td><td>100</td></tr></table>At the 1-year examination, one chipping fracture of the veneering</td></tr>
</table>

		ceramic (Fig 7) and one loss of retention were registered, both at MC restorations. The fractured crown was repaired by grinding and polishing, while the insufficient retention at the other crown resulted in fabrication of a new MC restoration.
	success rate	NR
결론		단기간의 추적관찰 기간동안 메탈-세라믹 크라운과 전체 세라믹 크라운은 Marginal bone loss과 심미적 결과에 있어서 통계적으로 유의한 차이가 없었음. 비록 메탈-세라믹 크라운에 비해 전체 세라믹 크라운이 less optimal marginal adaptationrhk 임플란트 주변 점막의 염증반응이 많이 나타남
기타		
- 재정지원		사적지원 The authors express special thanks to Astra Tech, Sweden for financial support and delivery of abutments and are grateful for the financial support from DSOI (Danish Society for Oral Implantology) and the KOF/Calcin Foundation of The Danish Dental Association (Tandlageforeningen). We also acknowledge Associate Professor Lene Theil Skovgaard at the Department of Biostatistics for her help in the statistical analyses.

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">75</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Schmitt (2010)</td></tr>
<tr><td rowspan="3">연구방법</td><td>• 연구설계</td><td>전향적 환자군 연구</td></tr>
<tr><td>• 연구국가</td><td>독일</td></tr>
<tr><td>• 연구기관</td><td>단일기관
- Dental Clinic 2-Department of Prosthodontics,
Friedrich-Alexander-University Erlangen-Nuremberg, Germany.</td></tr>
<tr><td></td><td>• 연구기간</td><td>2003-2005</td></tr>
<tr><td rowspan="8">연구대상</td><td>• 포함기준</td><td>상악 전치에 임플란트 치료가 필요한 환자</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>10/19</td></tr>
<tr><td>• 표본수집방법</td><td>연속적</td></tr>
<tr><td>• 연령</td><td>42.1</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>10</td><td>100</td></tr><tr><td>male</td><td>4</td><td>40</td></tr><tr><td>female</td><td>6</td><td>60</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>19</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>19</td><td>100</td></tr><tr><td>소구치(Premolar)</td><td>0</td><td>0</td></tr><tr><td>대구치(Molar)</td><td>0</td><td>0</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>19</td><td>100</td></tr><tr><td>하악(Mandible)</td><td>0</td><td>0</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>NR</td></tr>
<tr><td>• 수술시기
(발치-수술)</td><td>NR</td></tr>
<tr><td>• 보철시기
(수술-보철)</td><td>NR</td></tr>
<tr><td>보철타입</td><td></td><td>cemented</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td>• 비교치료법</td><td>-</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>90% (9/10)</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 :39.2m /최소 : 3y /최대:</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td><table><tr><th></th><th>시점</th><th>event</th><th>total</th><th>%</th></tr><tr><td>Implant survival rate</td><td>3y</td><td>17</td><td>17</td><td>100</td></tr></table></td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">100 %의 생존율과 성공률이 기록되었으며, 이는 임상 적 방법이 심각하게 손상된 전치를 복원하기위한 신뢰할 수있는 치료 방법 일 수 있음을 시사함.</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">NR</td></tr>
</table>

<table>
<tr><td>연번(Ref ID)</td><td colspan="2">76</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Kim (2010)</td></tr>
<tr><td rowspan="4">연구방법</td><td>• 연구설계</td><td>후향적 환자기록 연구</td></tr>
<tr><td>• 연구국가</td><td>한국</td></tr>
<tr><td>• 연구기관</td><td>단일기관/ 다기관 (기관명)</td></tr>
<tr><td>• 연구기간</td><td>2004.03-2006.12</td></tr>
<tr><td rowspan="9">연구대상</td><td>• 포함기준</td><td>Based on patients' medical records and radiographs, the following criteria were examined: implant width and length, accompanying surgery performed at the time of implant
placement, bone graft materials and the type of barrier membrane, crownimplant ratio, the mesiodistal cantilever,
status of the opposing tooth, type of suprastructure, crestal bone loss, and implant failure and prosthetic complications.</td></tr>
<tr><td>• 제외기준</td><td>NR</td></tr>
<tr><td>• 표본수</td><td>87/96</td></tr>
<tr><td>• 표본수집방법</td><td>NR</td></tr>
<tr><td>• 연령</td><td>48 (22-68)</td></tr>
<tr><td>• 성</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>87</td><td>100</td></tr><tr><td>male</td><td>49</td><td>56.3</td></tr><tr><td>female</td><td>38</td><td>43.7</td></tr></table></td></tr>
<tr><td>• 치아 위치</td><td><table><tr><th></th><th>N</th><th>%</th></tr><tr><td>total</td><td>96</td><td>100</td></tr><tr><td>위치 1</td><td></td><td></td></tr><tr><td>전치(Anterior)</td><td>0</td><td>0</td></tr><tr><td>소구치(Premolar)</td><td>0</td><td>0</td></tr><tr><td>대구치(Molar)</td><td>96</td><td>100</td></tr><tr><td>위치 2</td><td></td><td></td></tr><tr><td>상악(Maxilla)</td><td>44</td><td>45.8</td></tr><tr><td>하악(Mandible)</td><td>52</td><td>54.2</td></tr></table></td></tr>
<tr><td>• 임플란트명</td><td>implants (Dentium)</td></tr>
<tr><td>• 수술시기 (발치-수술)</td><td>1 month to a maximum of 14 months (mean, 4.5 months)</td></tr>
<tr><td>• 보철시기 (수술-보철)</td><td>The healing period in the maxilla ranged from 4 to 12.5 months (mean, 6 months); healing in the mandible ranged from 1 to 14 months (mean, 3.3 months).</td></tr>
<tr><td>보철타입</td><td></td><td>cemented / screw</td></tr>
<tr><td rowspan="2">중재법 및 비교치료법</td><td>• 중재법</td><td>임플란트</td></tr>
<tr><td>• 비교치료법</td><td>NR</td></tr>
<tr><td rowspan="2">추적관찰</td><td>• Recall rate</td><td>NA</td></tr>
<tr><td>• 추적관찰기간</td><td>평균 : 24.7m /최소 : 12m /최대: 48m</td></tr>
<tr><td rowspan="2">결과 평가기준</td><td>survival</td><td>임플란트 유지 여부에 따라 구분</td></tr>
<tr><td>success</td><td>NR</td></tr>
<tr><td rowspan="2">결과</td><td>survival rate</td><td>4y 95.8%(92/96</td></tr>
<tr><td>success rate</td><td>NR</td></tr>
<tr><td>결론</td><td colspan="2">상악 및 하악 단일 어금니 임플란트의 실패 위험이 높고 loading 중 보철 합병증이 발생할 가능성도 높음. 따라서 캔틸레버를 최소화하려면 임플란트를 정밀하게 배치하고 주의 깊게 장기간 추적 관찰을 유지해야함.</td></tr>
<tr><td>기타</td><td colspan="2"></td></tr>
<tr><td>- 재정지원</td><td colspan="2">NR</td></tr>
</table>