

Patient-centered implant treatment giving reliability through simplicity (part 2- when bone is not where we want it to be)

Hugo De Bruyn & Stefan Vandeweghe

AOS Adelaide Novembre 2011

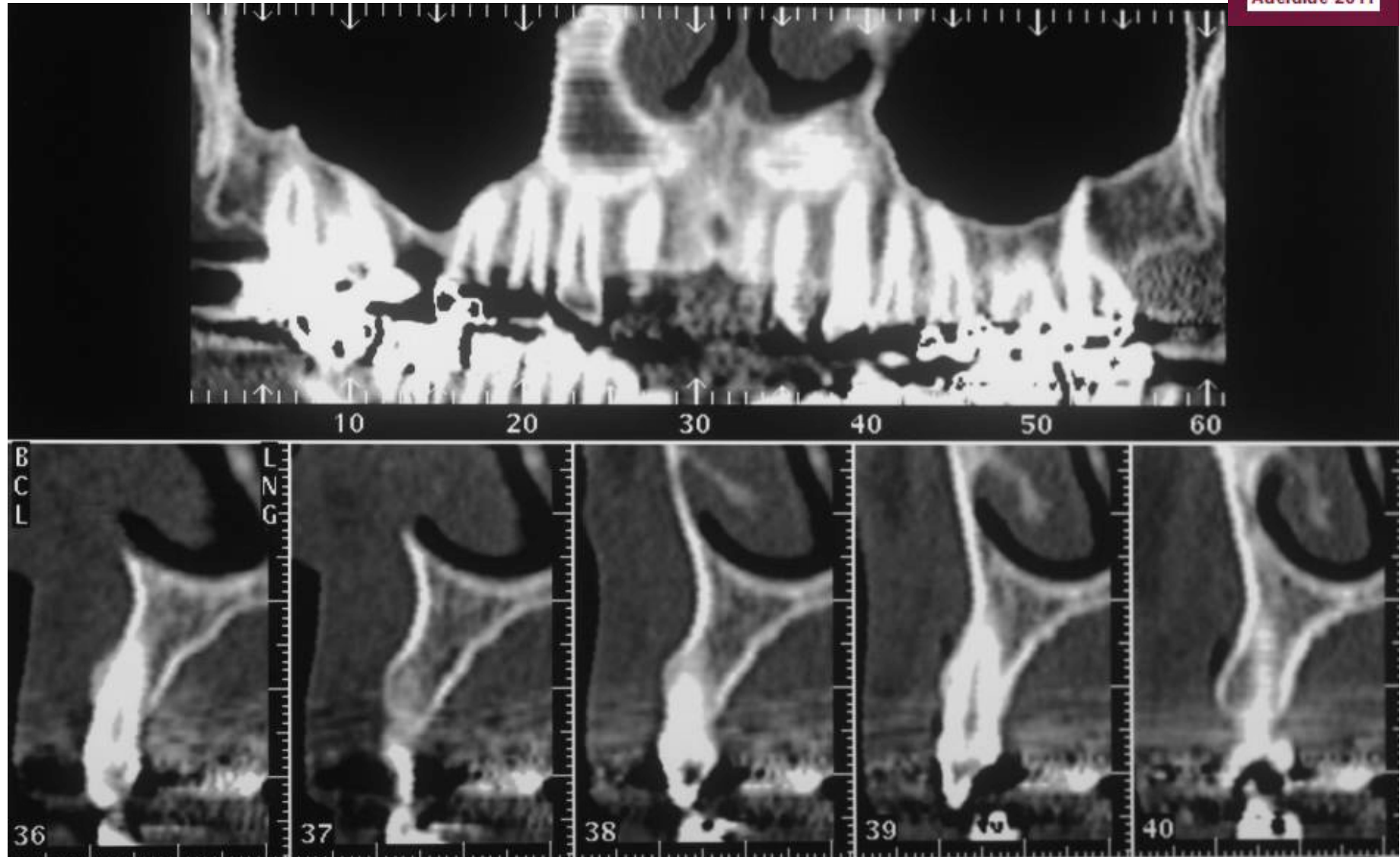


Acknowledgement Dr Andre Hattingh for some clinical pictures

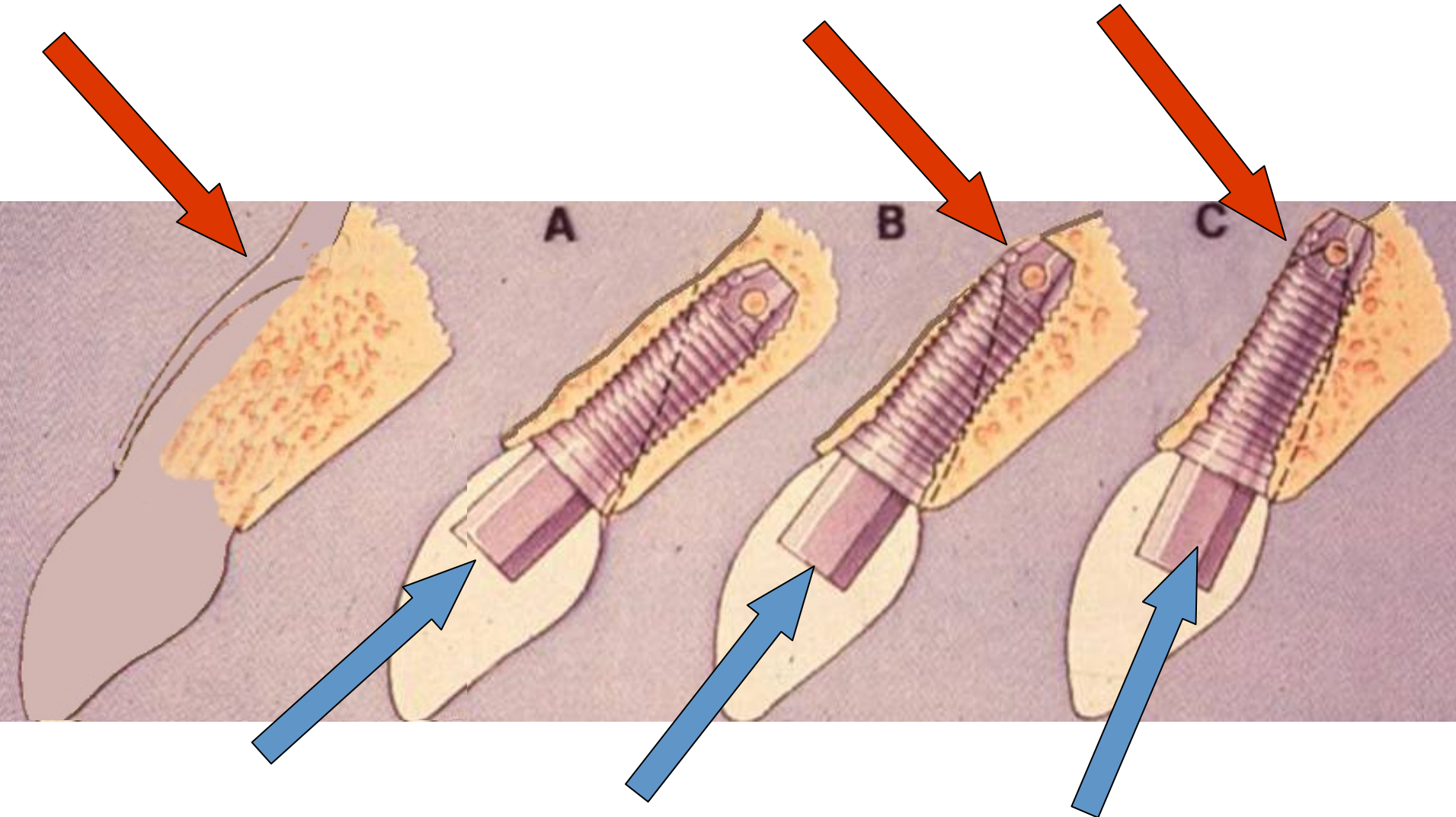
Department periodontology & oral implantology University of Ghent Belgium

Hugo.debruyn@ugent.be

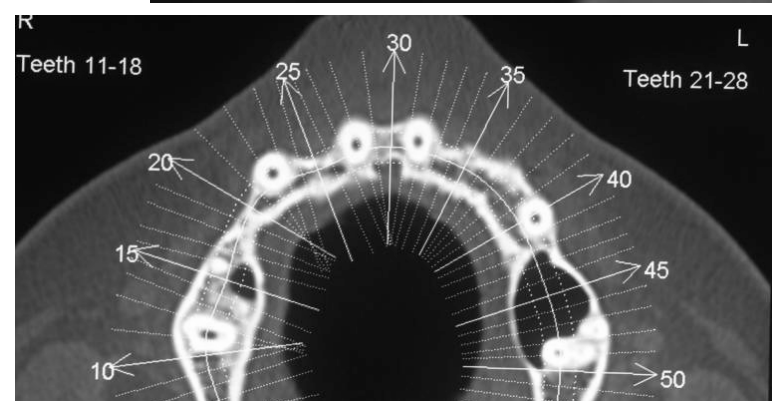
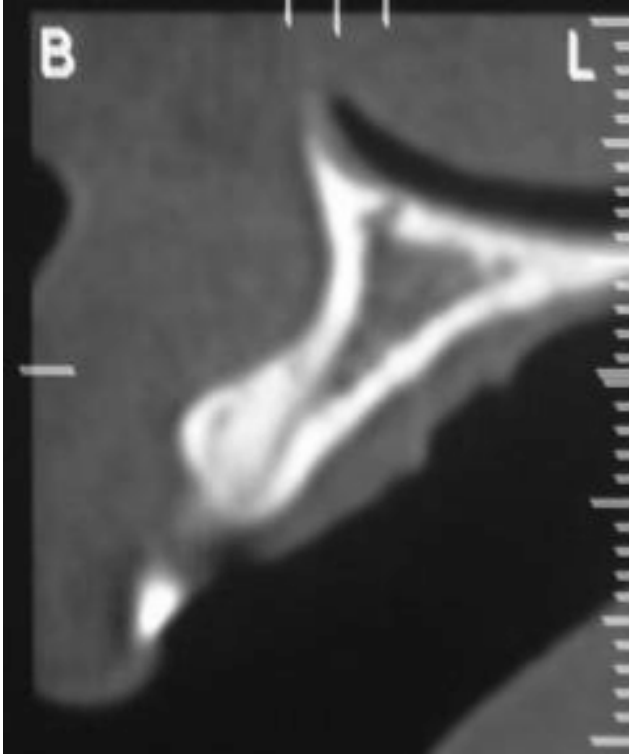
When the bone does not coincide with ideal implant location



When the bone does not coincide with ideal implant location



When the bone does not coincide with ideal implant location



A prospective study on angulated implants immediately loaded with a full ceramic crown

Hugo De Bruyn & Stefan Vandeweghe



University of Gent, Belgium

A 1-Year Prospective Study on Co-Axis® Implants Immediately Loaded with a Full Ceramic Crown

Stefan Vandeweghe, DDS;¹ Jan Cosyn, DDS, MSc, PhD;² Eric Thevissen, DDS, MSc;³
Linda Van den Berghe, DDS, MSc, PhD;⁴ Hugo De Bruyn, DDS, MSc, PhD⁵

ABSTRACT

Introduction: The Co-Axis® implant (Southern Implants®, Irene, South Africa) has a 12-degree angle in the implant neck to overcome angulation problems.

Aim: To examine bone loss, peri-implant health, and aesthetical outcome after 1-year follow-up.

Materials and Methods: Fifteen single implants were placed in 14 patients in the premaxilla and immediately loaded with a screw-retained full ceramic crown. Periapical radiographs and standardized photographs were taken to determine bone loss and soft tissue changes. Plaque and bleeding levels were assessed. Patients' satisfaction was measured using the Oral Health Impact Profile-14 questionnaire.

Results: After 1 year, all implants survived and mean bone loss was 1.20 mm, with no significant changes after 6 months. Plaque levels were low and no significant changes were observed. Bleeding levels decreased during the initial 3 months, but were constant thereafter. Before final torquing was performed after 6 months, four cases of screw loosening occurred. Also, one crown had a piece of porcelain chipped off. Patients reported an overall increase in well-being. A mean midfacial recession of 0.37 mm was observed. The mesial papilla showed a slight increase of 0.14 mm, while the distal papilla decreased 0.35 mm.

Conclusion: With 100% survival and stable bone levels after 6 months, the Co-Axis implant showed a good clinical outcome when immediately loaded. The use of a full ceramic crown as a first and final restoration resulted in a good aesthetic outcome with few changes in papilla fill, although midfacial soft tissue was stable only after 1 year.

KEY WORDS: co-axis, dental implant, immediate loading, implant angulation, prosthetic complication, single implants, soft tissue changes, southern implant

INTRODUCTION

The most important reason for tooth extraction is an endodontic complication, followed by tooth fracture,

trauma, periodontitis, and caries.¹⁻⁴ Single tooth replacement using implant therapy has proven to be predictable in short- and long-term studies with respect to implant survival.⁴⁻⁸ Nevertheless, it is a challenge because the restorations do not rely on the surrounding dentition for support. In this way, it differs from other implant restorations like cross-arches and FPDs and may hold an increased risk.⁹ Additionally, the outcome of single implant crowns depends on the aesthetic demand of the patient and prosthetic features, such as tooth shape, color, translucency, symmetry with the neighboring teeth, and the emergency profile. The latter is predominantly depending on proper implant location whereby the availability of bone and restoratively guided surgical placement are decisive factors. Especially in the aesthetic zone of the maxilla, a correct three-dimensional implant position is essential to enhance the emergency profile determining the natural appearance

^{1,2}, Department of Periodontology & Oral Implantology, Faculty of Medicine and Health Sciences, University of Ghent, Ghent, Belgium;

³, Department of Periodontology & Oral Implantology, Faculty of Medicine and Health Sciences, University of Ghent, Ghent, Belgium;

⁴, Department of Periodontology & Oral Implantology, Faculty of Medicine and Health Sciences, University of Ghent, Ghent, Belgium;

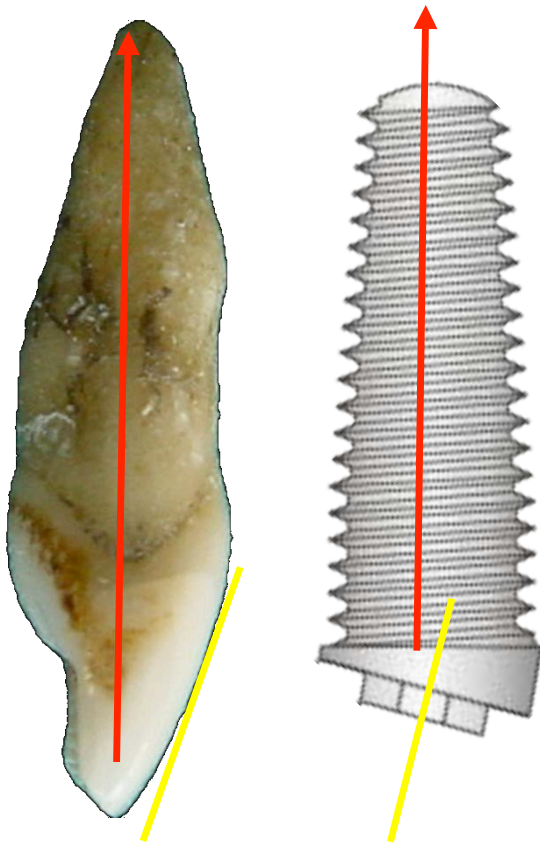
⁵, Department of Periodontology & Oral Implantology, Faculty of Medicine and Health Sciences, University of Ghent, Ghent, Belgium;

⁶, Department of Periodontology & Oral Implantology, Faculty of Medicine and Health Sciences, University of Ghent, Ghent, Belgium;

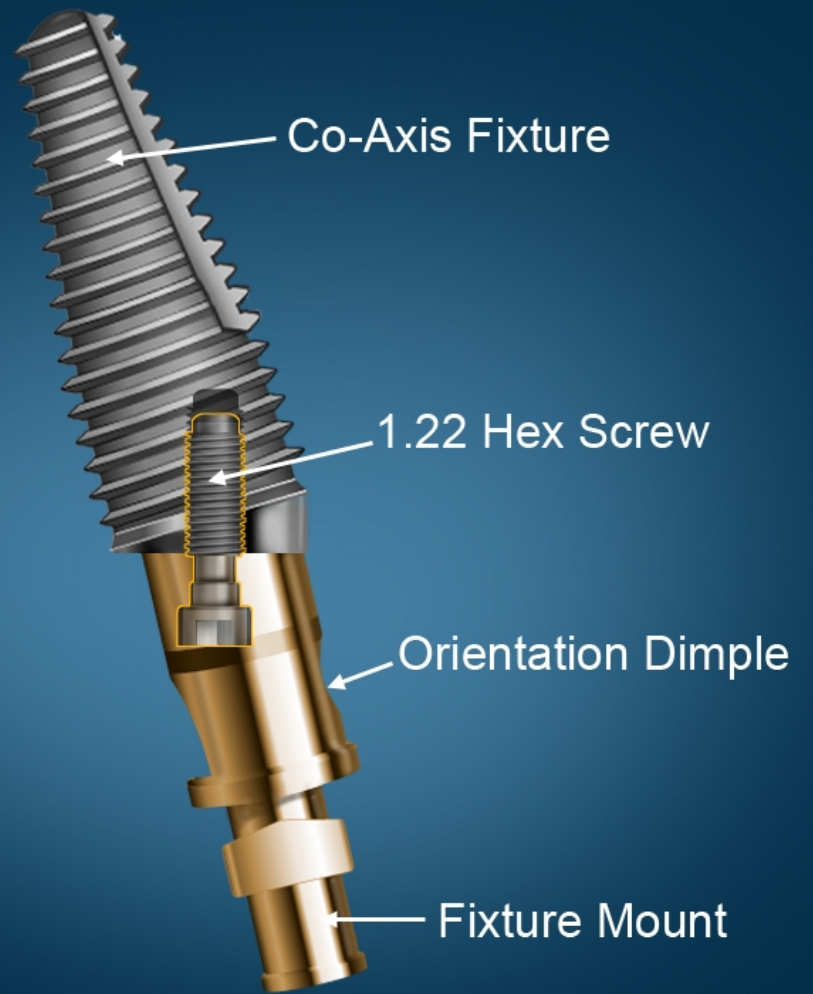
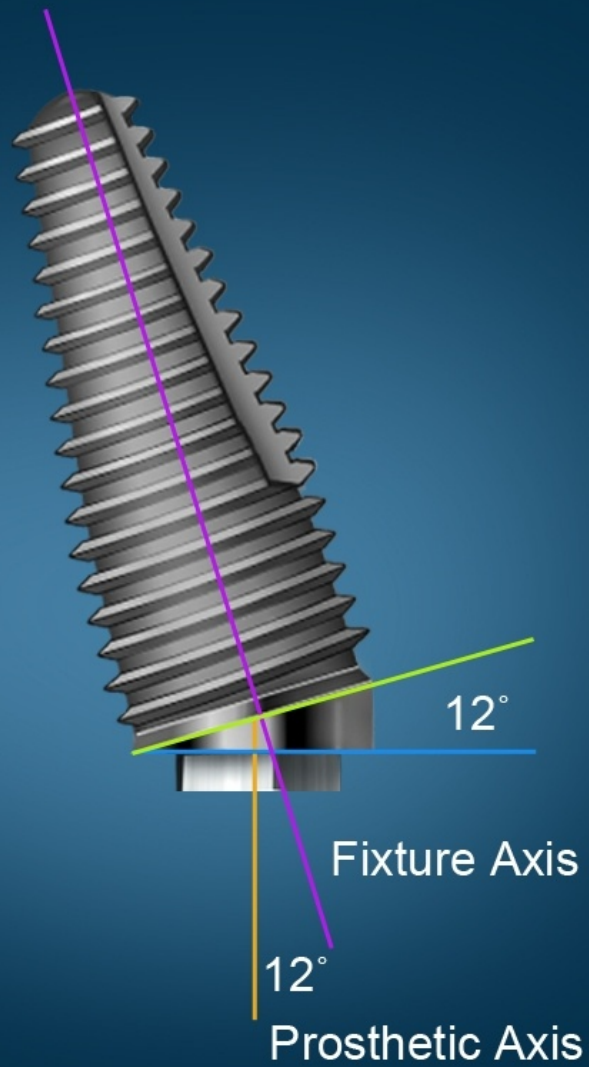
Reprint requests: Professor Dr Hugo De Bruyn, Department of Periodontology & Oral Implantology, University Hospital of Ghent - PB, De Pintelaan 185, 9000 Ghent Belgium; e-mail: hugo.debruyne@ugent.be

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Southern Implants Inc (Irene SA)
12-24-36 degrees angle



Introduction



Angulated implants immediately loaded with a full ceramic crown

Materials and Methods

Inclusion

- ❑ Patients > 18 years old
- ❑ Single implants with neighbouring teeth
- ❑ Anterior maxilla, 15-25
- ❑ Healed bone, at least 6 weeks post-extraction
- ❑ Adequate bone volume by clinical examination
- ❑ ASA I

Angulated implants immediately loaded with a full ceramic crown

Materials and Methods

Exclusion

- ❑ Heavy smokers (> 10 cig/day)
- ❑ Demanding esthetic cases
- ❑ Parafunctions
- ❑ Signs of infection



Angulated implants immediately loaded with a full ceramic crown

Materials and Methods

Protocol

- Flap surgery
- Drilling sequence
- Primary stability > 40 Ncm
- Impression
- Crown within 3 days
- Zirconia / Porcelain
- Recall sessions
- OHIP-14
- CBCT

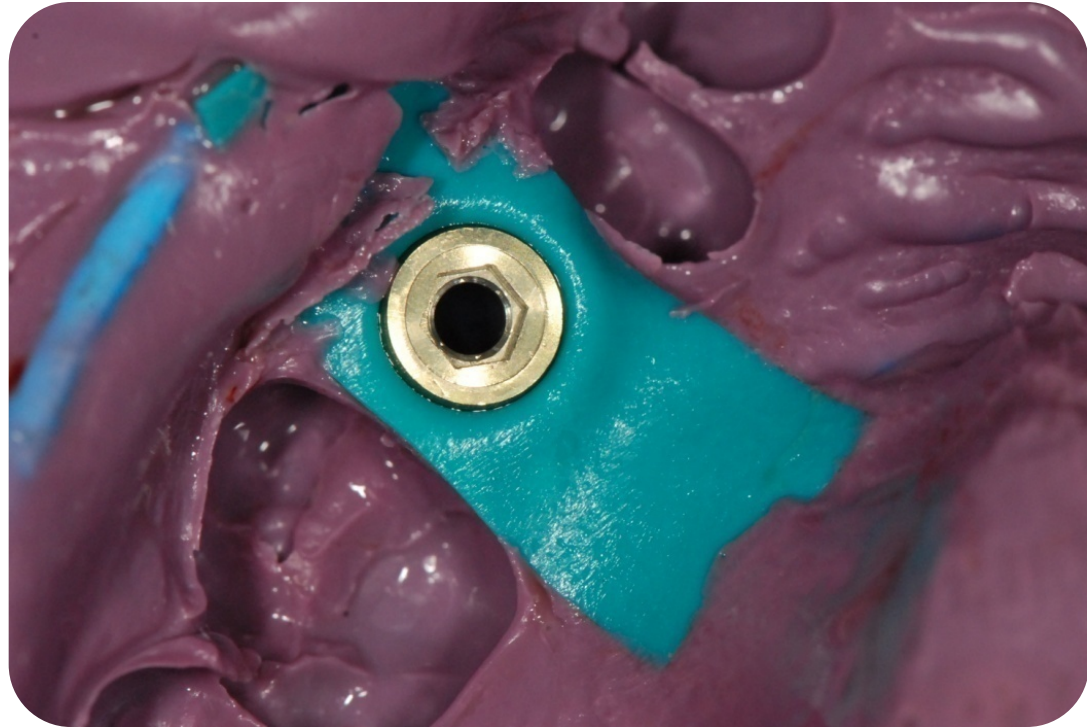


Angulated implants immediately loaded with a full ceramic crown

Materials and Methods

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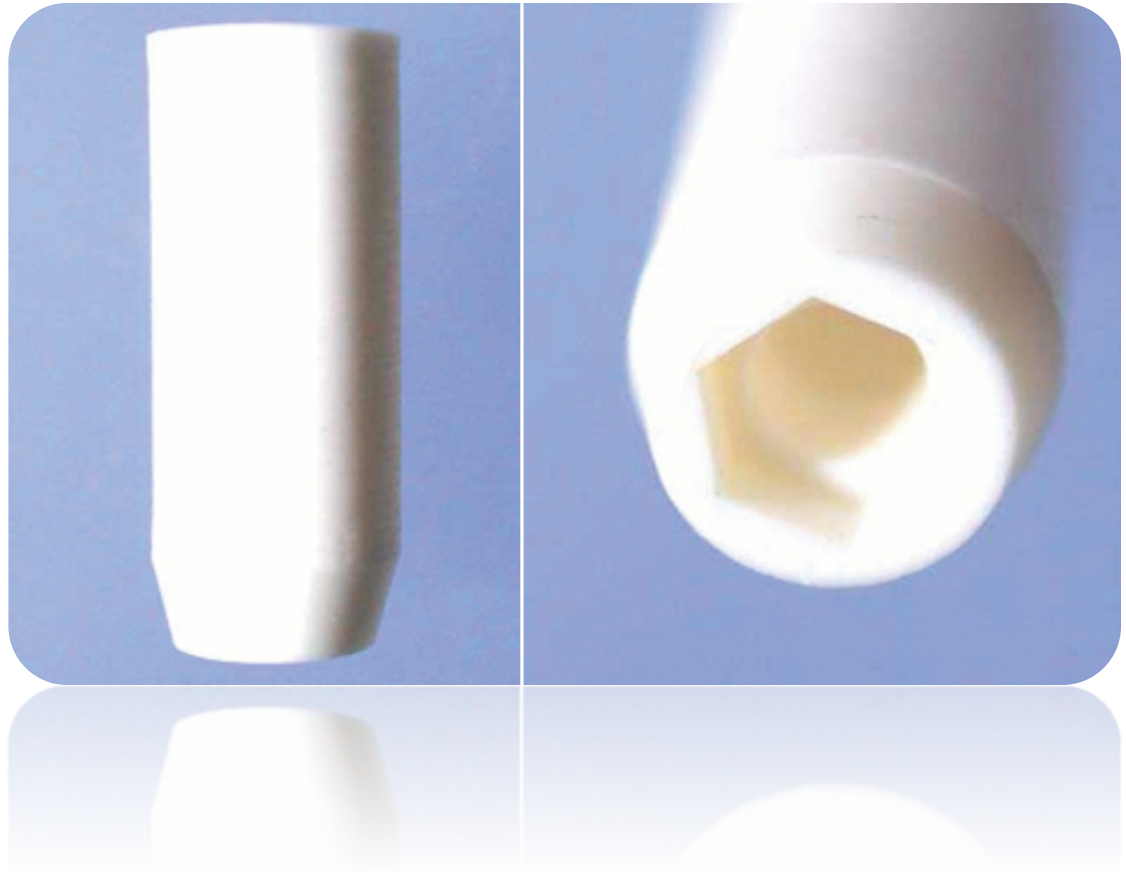


Angulated implants immediately loaded with a full ceramic crown

Materials and Methods

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Angulated implants immediately loaded with a full ceramic crown

Results

Patient distribution

- ❑ 14 patients
- ❑ Single in anterior maxilla (15-25 location)
- ❑ 6 male, 8 female
- ❑ Mean age 55 (31-80)
- ❑ 1 smoker (4 cig/day)

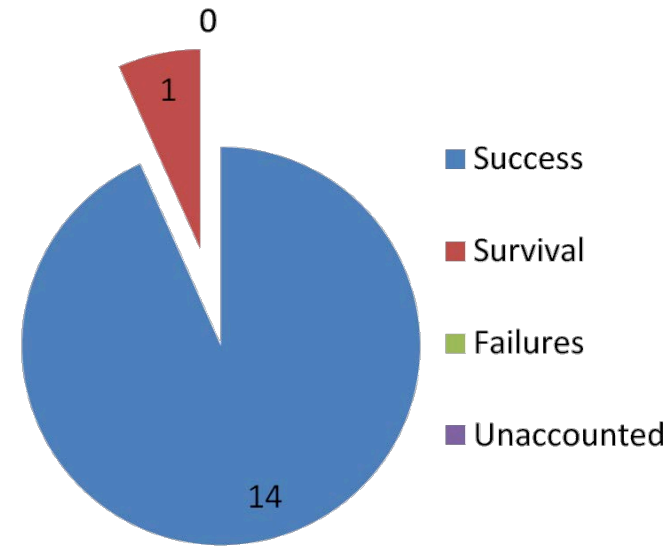


Co-Axis clinical research

Marginal bone loss

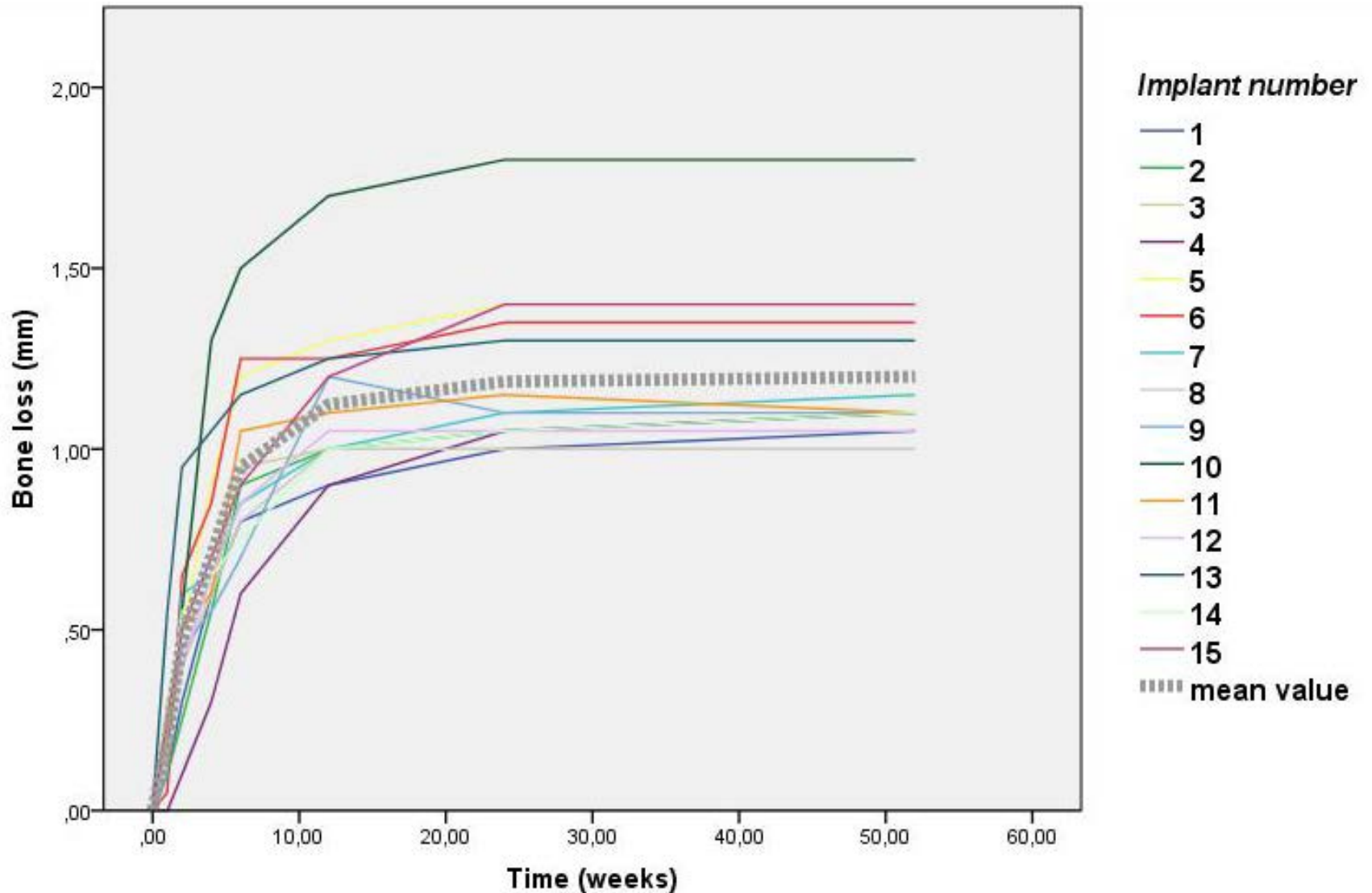


Time	Mean	SD	Range	P-value
1 weeks	0.19 mm	0.129	0.00 - 0.55	0.001*
2 weeks	0.47 mm	0.193	0.10 - 0.95	0.001*
4 weeks	0.70 mm	0.239	0.30 - 1.30	0.001*
6 weeks	0.95 mm	0.239	0.60 - 1.50	0.001*
3 months	1.12 mm	0.205	0.90 - 1.70	0.001*
6 months	1.19 mm	0.224	1.00 - 1.80	0.008*
12 months	1.20 mm	0.215	1.00 - 1.80	0.052



Co-Axis clinical research

Marginal bone loss



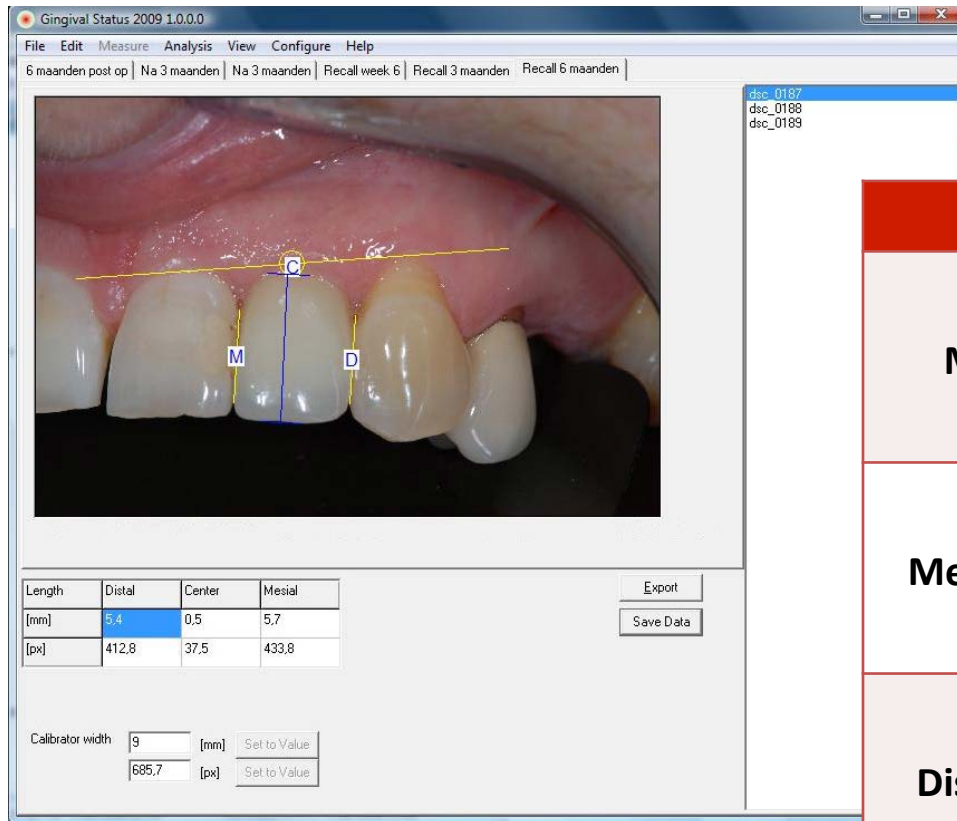


- Ongoing mid-facial recession
- No significant changes in mesial papilla height
- Decrease in distal papilla height during first 3 months

Co-Axis clinical research



Soft tissue



	Time	Recession
Mid facial	3 months	0.30 mm
	6 months	0.31 mm
	12 months	0.37 mm
Mesial papilla	3 months	0.07 mm
	6 months	- 0.19 mm
	12 months	- 0.14 mm
Distal papilla	3 months	0.54 mm
	6 months	0.44 mm
	12 months	0.35 mm

- Ongoing mid-facial recession
- No significant changes in mesial papilla height
- Decrease in distal papilla height during first 3 months

Angulated implants immediately loaded with a full ceramic crown

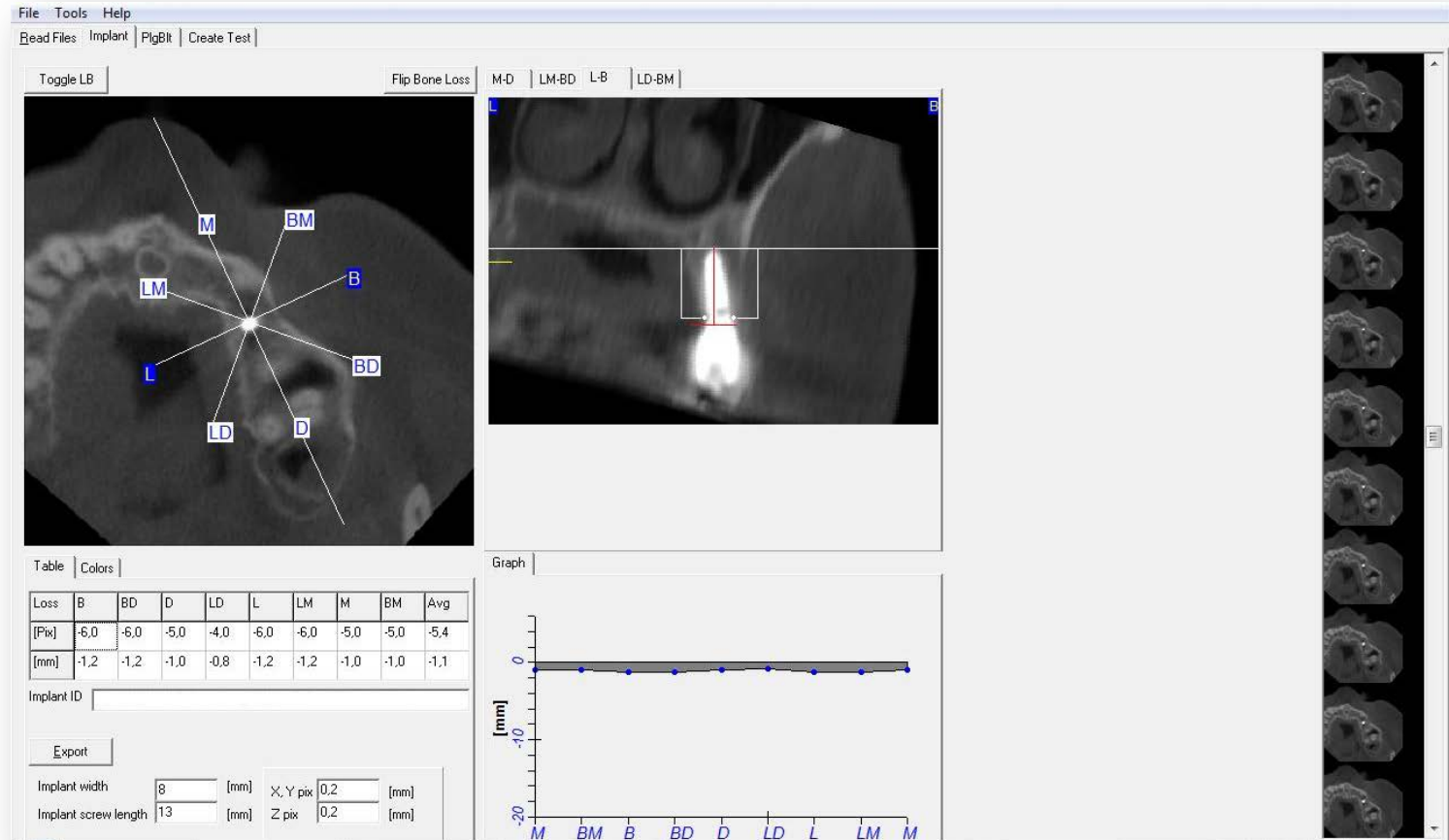
Results

Implant bone loss

3D Cone Beam CT

✓ 1 week

✓ 6 months



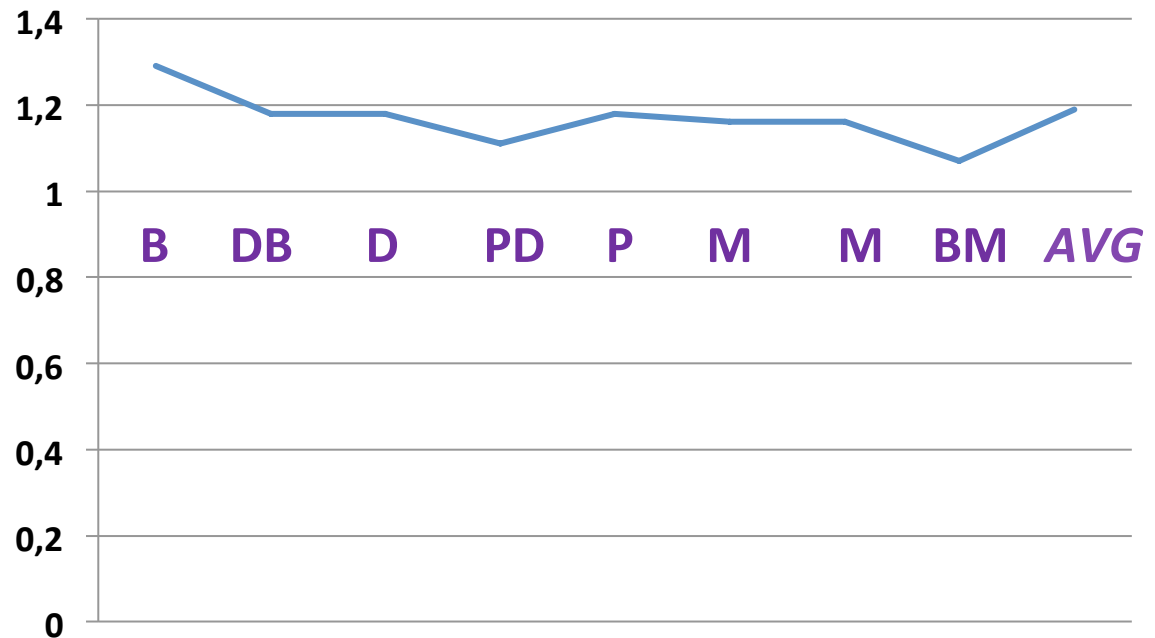
Angulated implants immediately loaded with a full ceramic crown

Results

Implant bone loss

3D Cone Beam CT

<i>Buccal</i>	<i>1,29 mm</i>
<i>Bucco-Distal</i>	<i>1,18 mm</i>
<i>Distal</i>	<i>1,18 mm</i>
<i>Palato-Distal</i>	<i>1,11 mm</i>
<i>Palatal</i>	<i>1,18 mm</i>
<i>Palato-Mesial</i>	<i>1,16 mm</i>
<i>Mesial</i>	<i>1,16 mm</i>
<i>Bucco-Mesial</i>	<i>1,07 mm</i>
AVERAGE	1,19 mm





OHIP-14

- Q1: Have you had trouble pronouncing any words because of problems with your teeth, mouth or dentures?*
- Q2: Have you felt that your sense of taste has worsened because of problems with your teeth, mouth or dentures?*
- Q3: Have you had painful aching in your mouth?*
- Q4: Have you found it uncomfortable to eat any foods because of problems with your teeth, mouth or dentures?*
- Q5: Have you been self conscious because of your teeth, mouth or dentures?*
- Q6: Have you felt tense because of problems with your teeth, mouth or dentures?*
- Q7: Has your diet been unsatisfactory because of problems with your teeth, mouth or dentures?*
- Q8: Have you had to interrupt meals because of problems with your teeth, mouth or dentures?*
- Q9: Have you found it difficult to relax because of problems with your teeth, mouth or dentures?*
- Q10: Have you been a bit embarrassed because of problems with your teeth, mouth or dentures?*
- Q11: Have you been a bit irritable with other people because of problems with your teeth, mouth or dentures?*
- Q12: Have you had difficulty doing your usual jobs because of problems with your teeth, mouth or dentures?*
- Q13: Have you felt that life in general was less satisfying because of problems with your teeth, mouth or dentures?*
- Q14: Have you been totally unable to function because of problems with your teeth, mouth or dentures?*

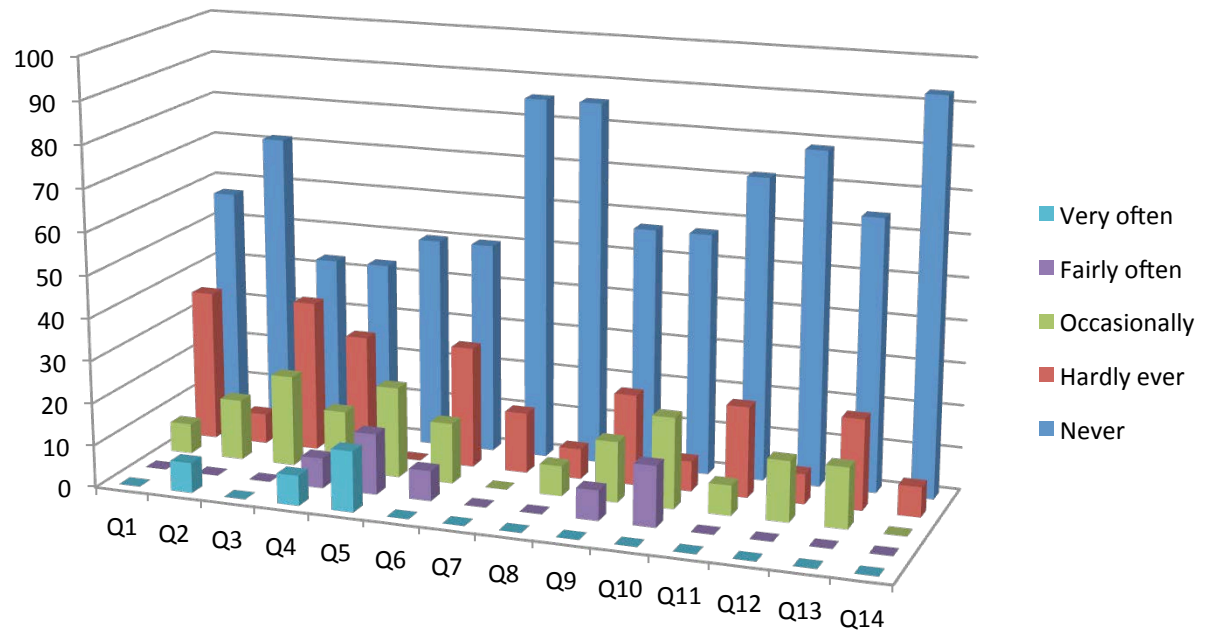
Co-Axis clinical research

Quality of Life



Before surgery

- Q1: pronunciation*
- Q2: sense of taste*
- Q3: painful aching*
- Q4: uncomfortable to eat food*
- Q5: self consciousness*
- Q6: felt tense*
- Q7: diet unsatisfactory*
- Q8: interrupt meals*
- Q9: difficult to relax*
- Q10: been embarrassed*
- Q11: been irritable*
- Q12: difficulty doing job*
- Q13: life in general less satisfying*
- Q14: unable to function*



Co-Axis clinical research

Quality of Life



After 6 months

Q1: pronunciation

Q2: sense of taste

Q3: painful aching

Q4: uncomfortable to eat food

Q5: self consciousness

Q6: felt tense

Q7: diet unsatisfactory

Q8: interrupt meals

Q9: difficult to relax

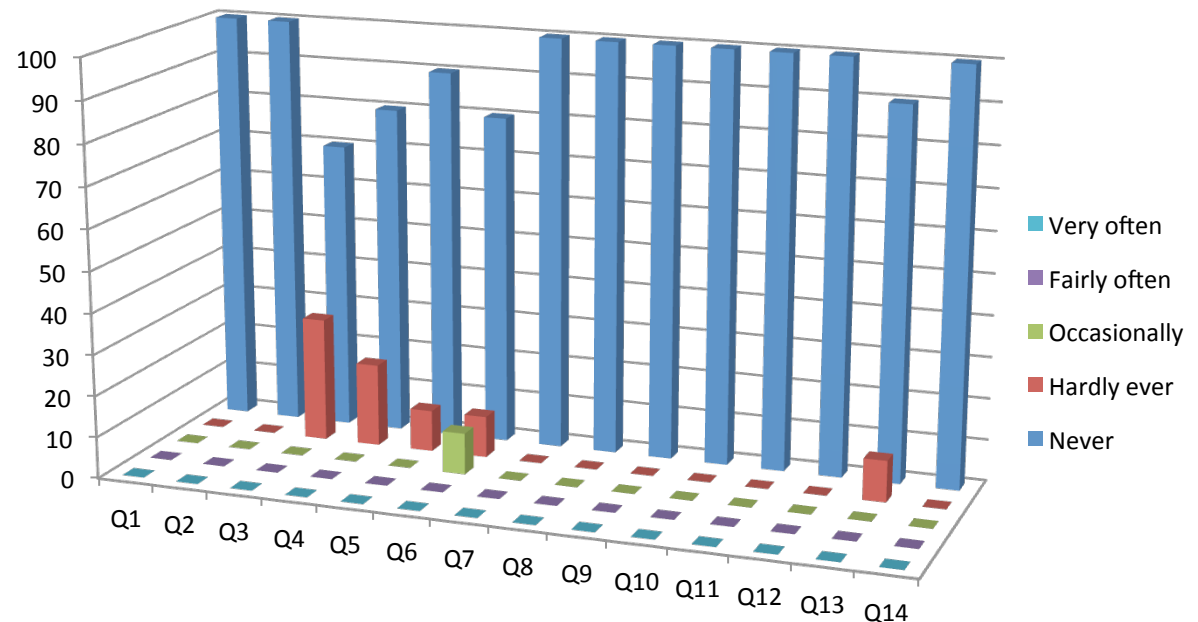
Q10: been embarrassed

Q11: been irritable

Q12: difficulty doing job

Q13: life in general less satisfying

Q14: unable to function



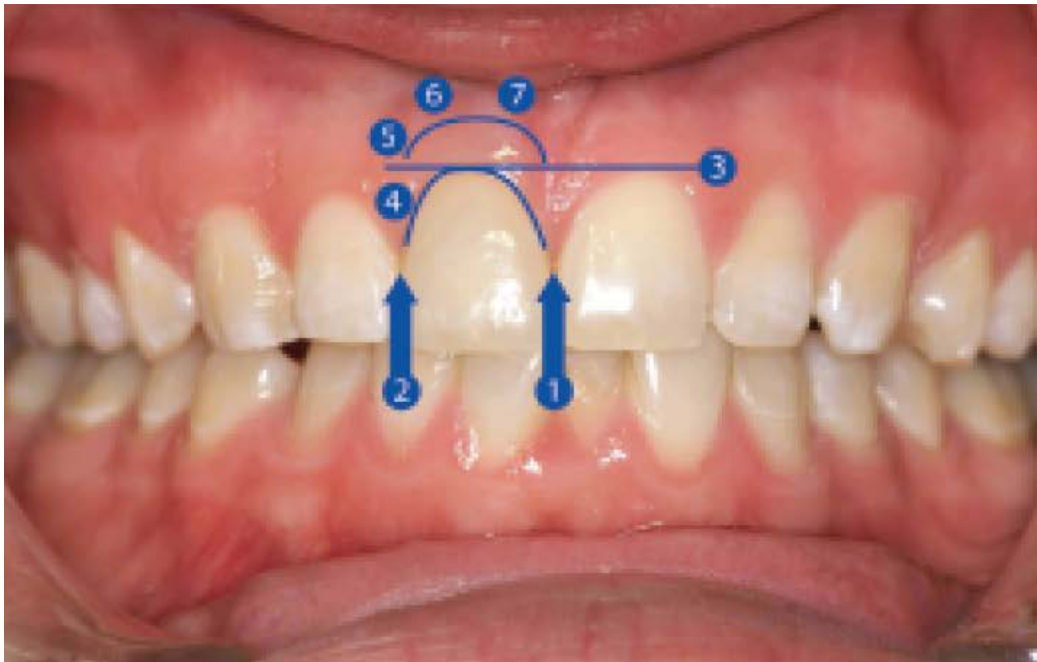
Angulated implants immediately loaded with a full ceramic crown

Results

Esthetics

Mean Pink Esthetic Score = 8.35 / 14

Mean White Esthetic Score = 6.35 / 10



WES

1: Tooth Form	0	1	2
2: Outline/Volume	0	1	2
3: Color (hue/value)	0	1	2
4: Surface Texture	0	1	2
5: Translucency/Characterization	0	1	2

Maximum Score: 10

Angulated implants immediately loaded with a full ceramic crown

Results

Complications

- 4 cases of screw-loosening before final torquing at 6 months
- 1 case of porcelain chipping at 1 year control



Angulated implants immediately loaded with a full ceramic crown

Discussion

Single tooth replacement by immediate loading

Siddique et al., J Oral Implantol 2008

98.04 % success, mean bone loss 1.05 mm

Hall et al., Clin Impl Dent Relat Res 2007

No difference between immediate and delayed loading

Glauser et al., J Prosthet Dent 2007

97.5 % survival after 5 years, 1.54 mm bone loss

Hahn, J Oral Implantol 2007

97.9 % survival up to 3 years

Degidi et al., J Oral Implantol 2006

95.5 % survival after 5 years, all early failures

Angulated implants immediately loaded with a full ceramic crown

Discussion

Single tooth replacement by immediate loading

- Immediate loading has a comparable outcome as delayed loading if primary stability can be achieved (> 35 Ncm)
- Improved stability using tapered implants
- Functional loading = non-functional loading
- Tilted implants hold no increased risk
- Several studies also reported soft tissue recessions during the first year
- Provisional or final crown???

Hall et al. 2007; Ericsson et al. 2000; Lindeboom et al. 2006; Koutouzis et al. 2007; Nothdurft et al. 2010; Kan et al. 2003; Misch et al. 2008; De Rouck et al. 2008

Angulated implants immediately loaded with a full ceramic crown

Conclusion

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- Predictable outcome regarding bone loss and survival
- Overcoming angulation problems
- High patient satisfaction
- Good esthetic results
- Shorten treatment time

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- Technique sensitive procedure
- Esthetics: Provisional crown > Final crown

Materials and Methods

Case studies with single tooth implants under immediately full load (Nikolopoulos – Hattingh – Ghent)

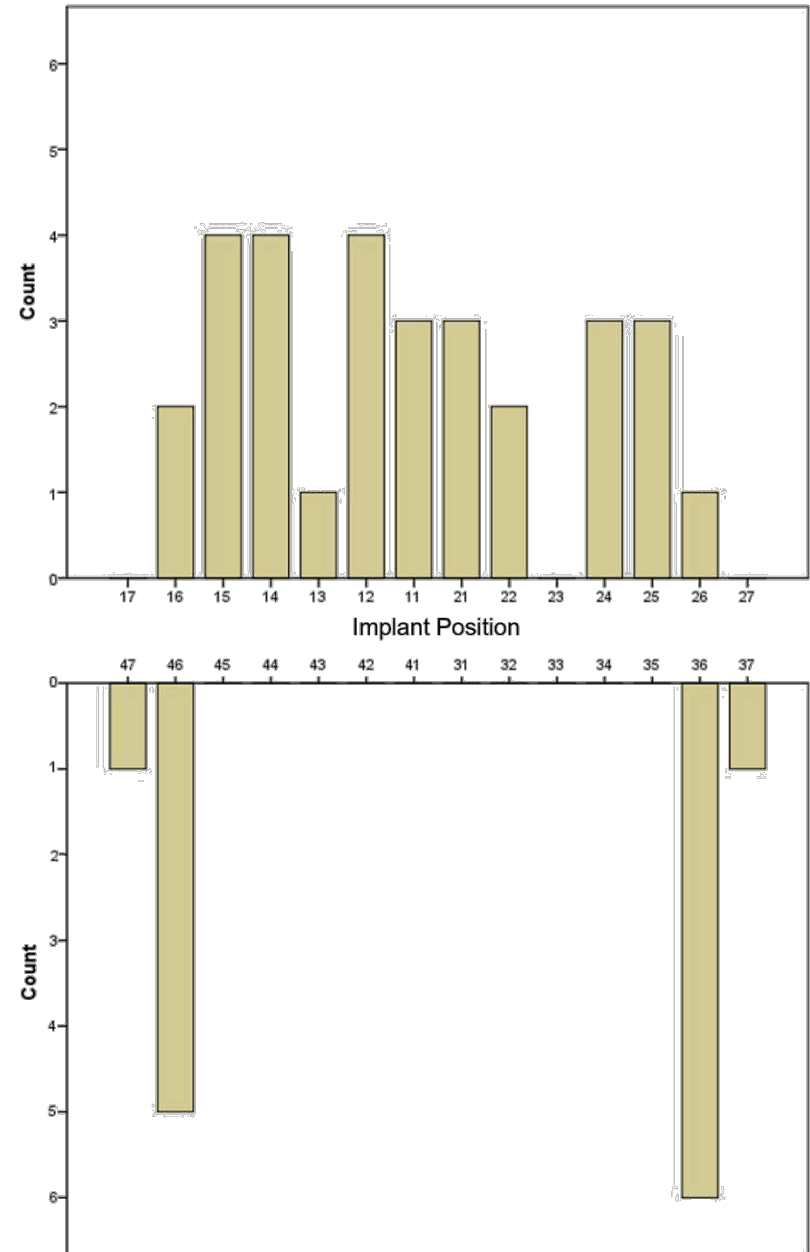
Protocol

- Group 1 = Immediate placement / Flapless
- Group 2 = Delayed placement / Flap surgery
- Primary stability > 40 Ncm
- Impression
- Crown within 3 days
- Zirconia / Porcelain
- Recall sessions

Immediate loading + Immediate placement

Results

- 38 patients (5 smokers)
- 43 implants
 - Immediate placement: 23 implants
 - Delayed placement: 20 implants
- Maxilla: 30 implants
- Mandible: 13 implants



Immediate loading + Immediate placement

Results

Baseline

20 months

Delayed + Immediate

(A)

(B)

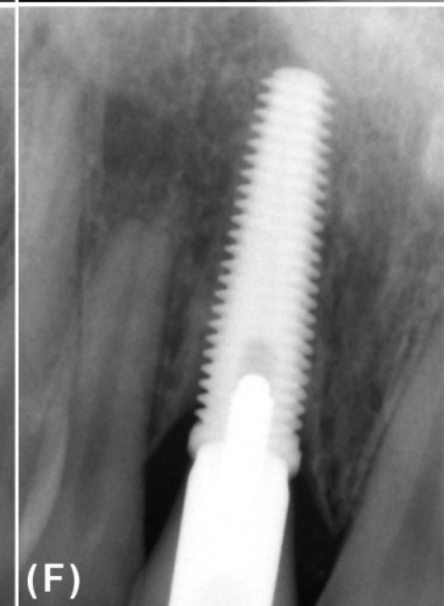
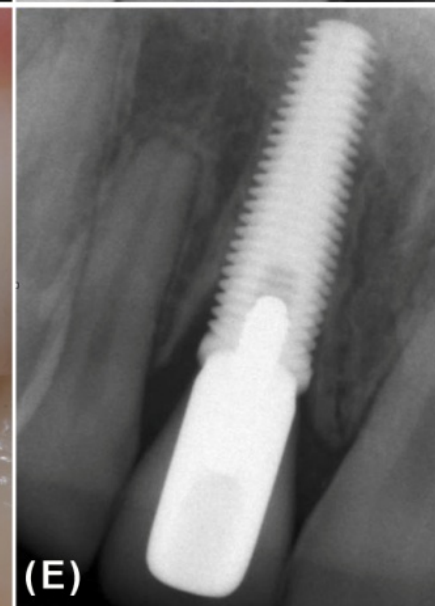
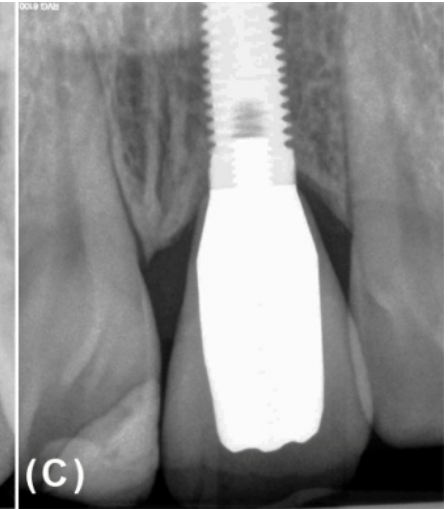
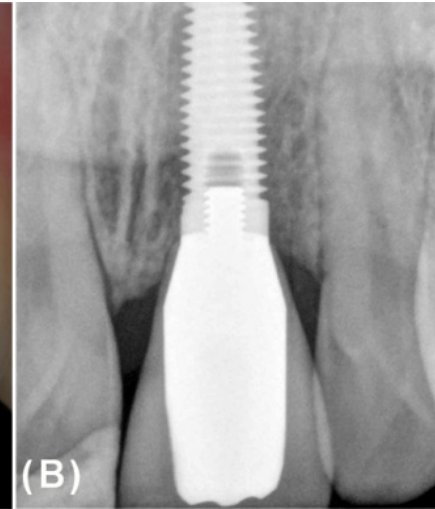
(C)

(D)

Immediate + Immediate

(E)

(F)

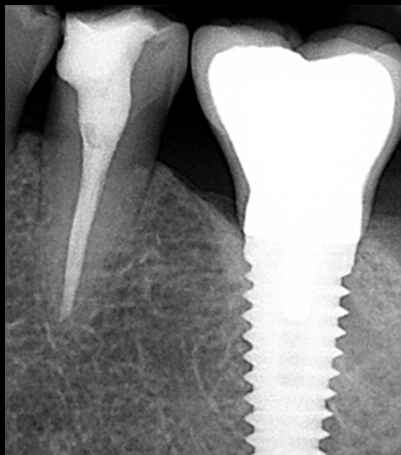


Immediate loading + Immediate placement

Results

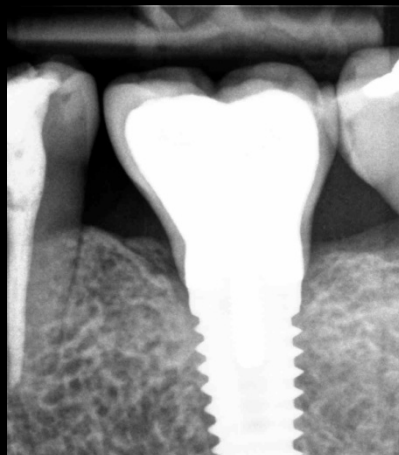
- Mean follow-up of 26 months (SD 11, range 8-44)
- Implant survival = 100 %
- Mean bone loss = 1.00 mm (SD 0.30, range 0.24 – 1.64)
- Bone loss: delayed placed implants > immediately placed implants
- 2 crowns experienced also porcelain chipping

Baseline



Immediate placement

3 years



Baseline



Delayed placement

1 year

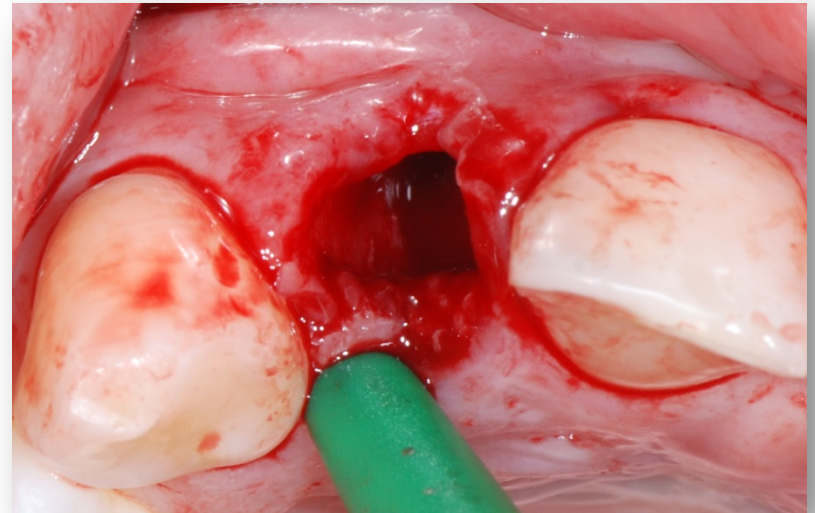


Immediate loading + Immediate placement

Discussion

- Reduced bone loss around immediately placed implants:

- No flap
- Deeper placement
- Healing potential?



- Immediate placement + immediate loading:

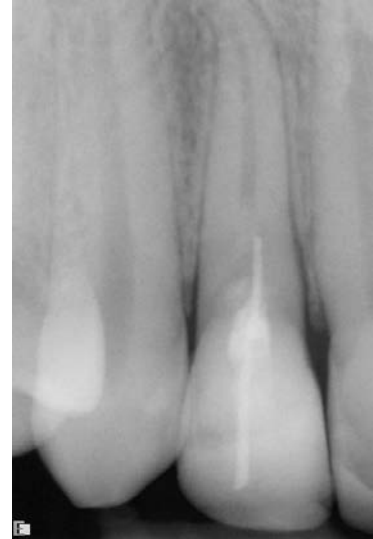
- Increased risk
- Improve esthetic outcome!
- Optimal soft tissue support

Immediate loading + Immediate placement

Discussion

Case selection

- No infection
- Intact buccal bone plate
- Intact soft tissue profile
- Biotype => risk!
- Jumping distance > 1.5 mm: bone graft



Immediate loading + Immediate placement

Conclusion

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- 100% survival and limited bone loss
- Less destructive
- Esthetics
- Decreased treatment time

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- Technique sensitive procedure
- Only short timr data available

CONCLUSIONS

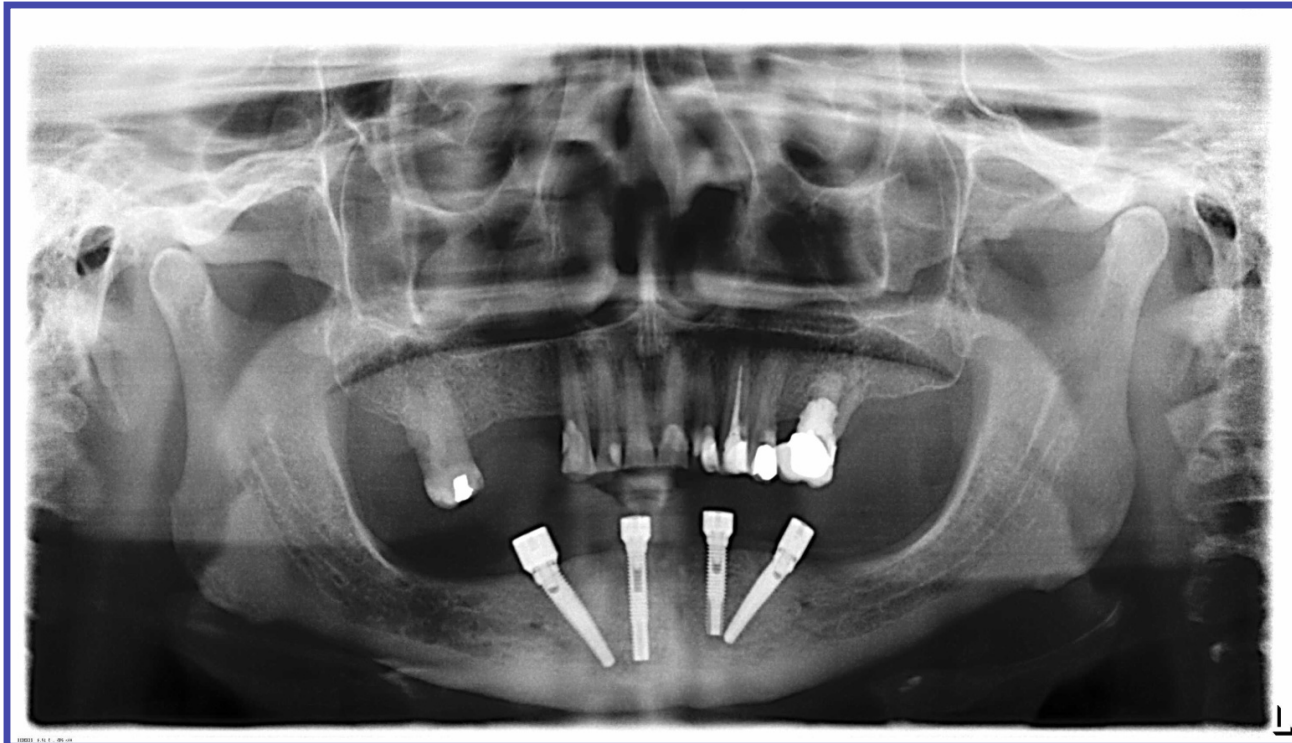
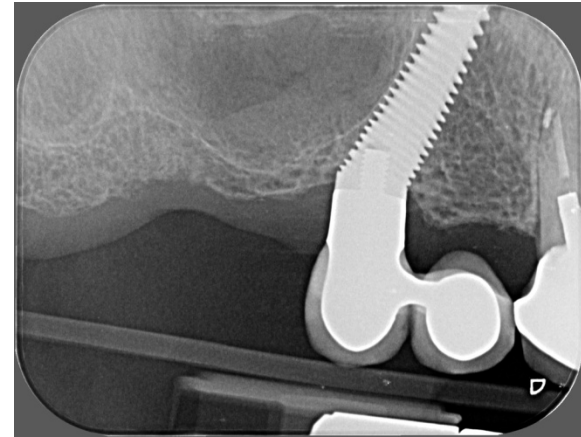
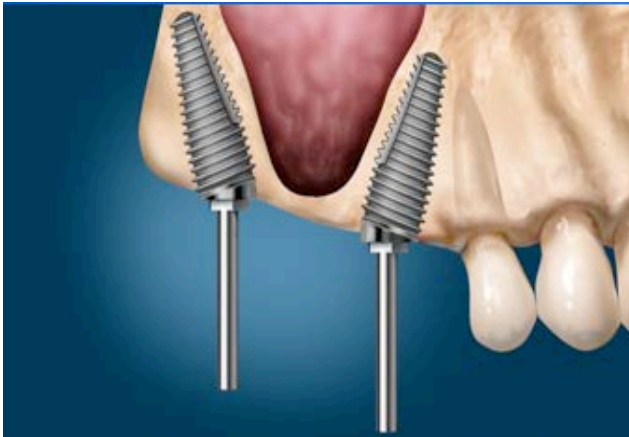
Immediate loading:

- Primary stability: implant & surgery
- Careful patient selection: parafunctions!
- Careful prosthetics: occlusion and articulation
- For esthetical reasons: use a provisional
- Improve patient satisfaction, improve your practice

Immediate placement + immediate loading:

- Proper case selection: implant site
- Careful prosthetic procedure: no pressure

Co-Axis 24°



Factors for successful outcome in implant dentistry

- Implant
- Surgeon
- Dentist
- Dental technician
- Patient



