



The effect of one-time abutment placement on marginal bone levels and peri-implant soft tissues: 3 years results from a prospective randomized clinical trial



Ludovica Fierravanti, Nagore Ambrosio, Ana Molina, Ignacio Sanz, Conchita Martin, Juan Blanco, Mariano Sanz

University Complutense of Madrid

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INTRODUCTION - AIM

One of the main goals of current implant dentistry is not only to achieve osseointegration, but also to maintain the long-term stability of the soft and hard peri-implant tissues. The manipulation of the implant to abutment interphase components may influence the stability of the surrounding tissues. In experimental studies (1) repeated dis- and reconnection of prosthetic components could compromise the mucosal barrier around implants and resulted in an apical shift of the connective tissue attachment and the underlying bone. This experimental evidence prompted the development of the "one abutment at one-time" protocol consisting on the placement of the definitive restorative abutment at the time of implant surgery. The scientific evidence on its efficacy when applied to implants placed in healed sites is, however, unclear (2,3). Therefore, the aim of this study was to compare the effect of placing the definitive abutment at the time of implant placement versus at a later stage, on the soft and hard tissue changes around dental implants.

MATERIAL AND METHODS

- STUDY DESIGN: Prospective, randomized, parallel, controlled clinical trial
- TARGET POPULATION: Patients with at least one missing tooth in the posterior maxilla or mandible (positions 4-7), willing to receive implant supported restorations

SAMPLE SIZE CALCULATION

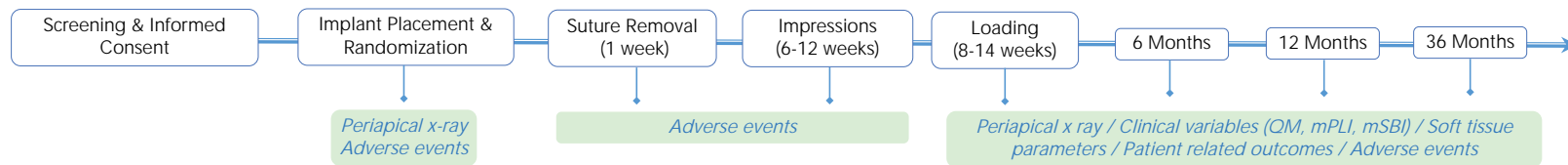
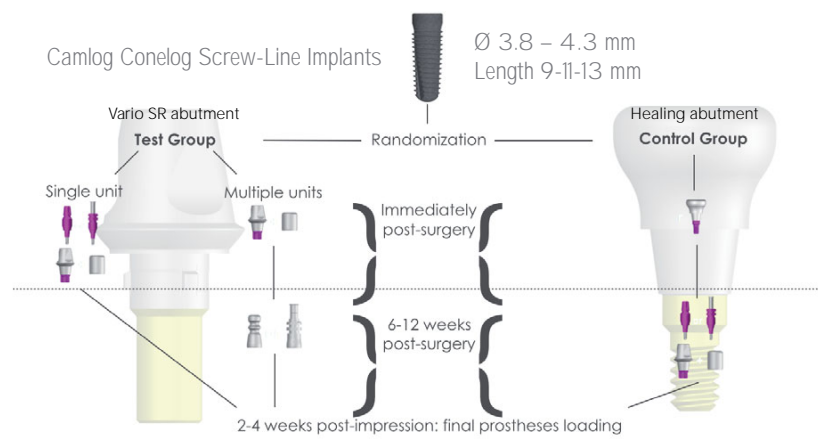
Mean difference of 0.20mm
Standard deviation of 0.157mm
Power of 95%
Level of significance of 5%
Drop outs of 10%

40 patients

- ### Inclusion criteria
- Male or female ≥ 18 years old
 - One or more adjacent missing teeth in the posterior maxilla or mandible (positions 4-7)
 - Natural tooth must be present medial to the implant site
 - Opposing dentition must be natural or implant supported fixed restorations
 - Adequate bone quality and availability for Camlog Conelog® Screw-Line implants placement of diameter 3.8mm or 4.3mm, and lengths of 9mm, 11mm, or 13 mm.
 - Patients willing to participate and attend the planned follow up visits

- ### Exclusion criteria
- SYSTEMIC: Uncontrolled disorders, medication interfering bone metabolism, physical handicaps, smokers > 10 cigs/day or tobacco chewers, alcoholism or drug abuse
 - LOCAL: bone augmentation on implant site < 3 months before, intraoral infection and inflammation, mucosal diseases (i.e. Erosive lichen planus), history of implant failure, post-extraction sites with < 6 weeks healing, severe bruxism.
 - INTRA-SURGICAL: lack of primary stability at surgery, need for bone augmentation procedures, inability to place the implant according to the prosthetic requirements

PRIMARY	Radiographic assessment	DIB (Distance implant shoulder - first bone contact) Distance bone crest to contact point	
SECONDARY	Clinical variables	Presence/absence Queratinized Mucosa PD mSBI (Mombelli 1987) mPLI (Mombelli 1987)	6 sites/implant Periodontal probe PCP-UNC 15
SECONDARY	Papilla filling	Papilla Index (Jemt 1997)	
SECONDARY	Soft tissue margin	CLT (Crown length tooth) CLI (Crown length implant) IP (Distance top of papilla to incisal edge)	
SECONDARY	Patient related outcomes	Patient satisfaction: comfort, appearance, masticatory function, taste, overall satisfaction	5 items scale: <i>very discontented, discontented, fair, satisfied, very satisfied</i>
SECONDARY	Adverse events	Nature and frequency of occurrence	Implant related / Non implant related



RESULTS

41 patients recruited → 2 excluded intrasurgically → 39 patients → 60 implants → 6 months → 36 patients → 56 implants → 12 months → 35 patients → 55 implants → 36 months → 33 patients → 52 implants

SURVIVAL RATES

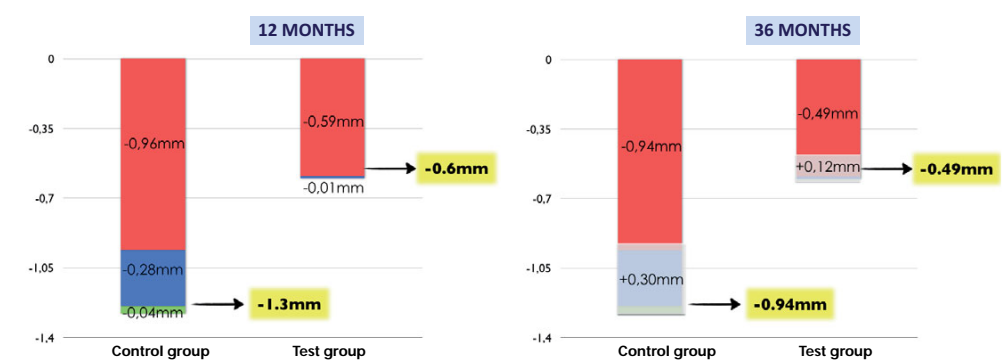
Test group: 96.6%
Control group: 100%

98.3%

ADVERSE EVENTS

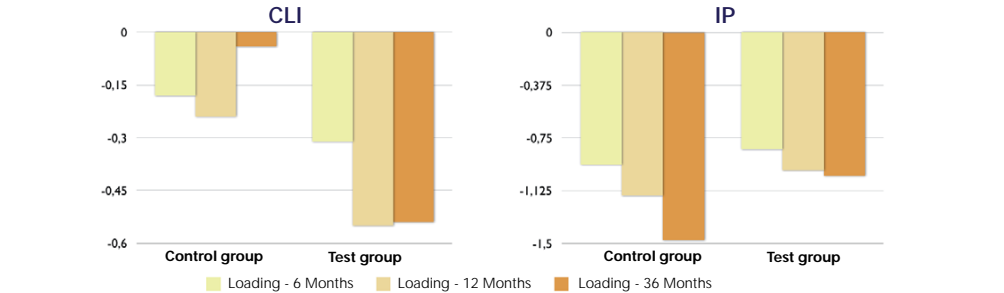
- Screw loosening: at impression (1: T), 6 months (3: 1C, 2T), 12 months (2: 1C, 1T)
- Vario SR abutment fracture: (1: C)

BONE LEVEL CHANGES

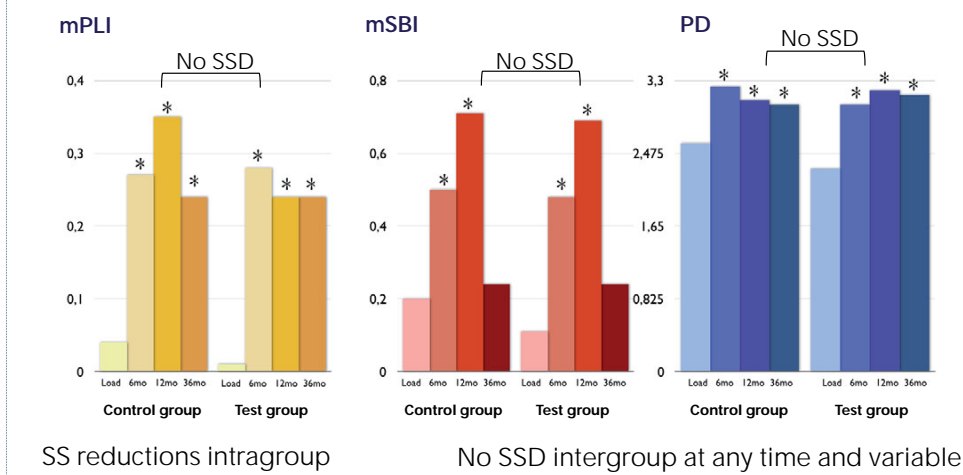


A tendency of greater bone loss was observed in the control group over time, being only statistically significant at 6 months. Between 12 months and 36 months, a slight bone gain was observed in both group.

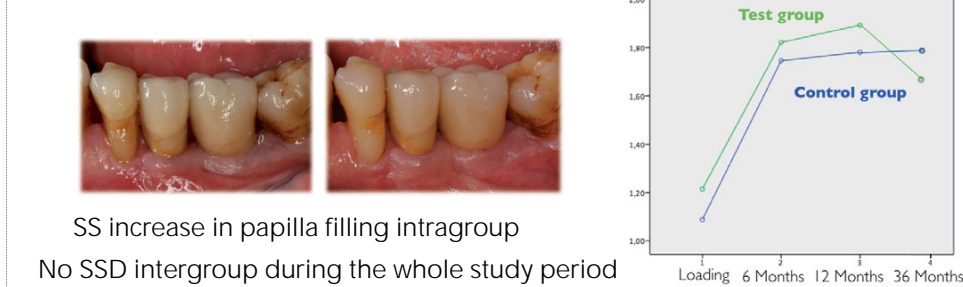
SOFT TISSUES MARGIN



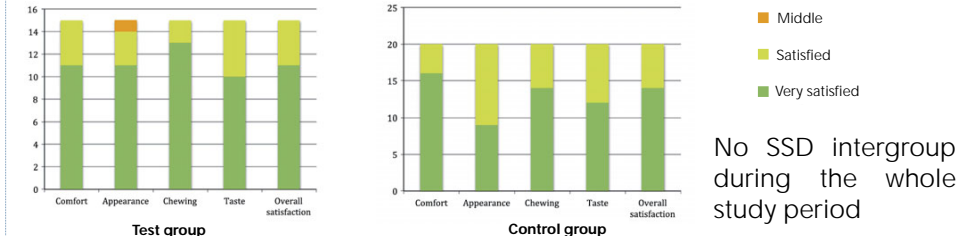
CLINICAL VARIABLES



PAPILLA FILLING - Jemt Score



PATIENT SATISFACTION



CONCLUSION

The one abutment - one time concept is associated with less marginal bone loss. Furthermore, peri-implant tissues stability seems to endure in the long term (3 years).

(1) Abrahamsson, I., Berglundh, T. & Lindhe, J. (1997) The mucosal barrier following abutment dis/reconnection. An experimental study in dogs. Journal of Clinical Periodontology 24:568-572. (2) Degidi, M., Nardi, D. & Piattelli, A. (2011) One abutment at one time: non-removal of an immediate abutment and its effect on bone healing around subcrestal tapered implants. Clinical Oral Implants Research 22: 1303-1307. (3) Grandi, T., Guazzi, P., Samarani, R. & Garuti, G. (2012) Immediate positioning of definitive abutments versus repeated abutment replacements in immediately loaded implants: effects on bone healing at the 1-year follow-up of a multicentre randomised controlled trial. European Journal of Oral Implantology 5: 9-16.