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 interface 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 0.2mm
  Standard deviation of 0.157mm
  Power of 95%
  Level of significance of 5%
  Drop out 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 medially 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 cig/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. Erosei 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

RESULTS

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 groups.

- 12 months
- 36 months

Adverse events

SOFT TISSUES MARGIN

No SSD increase in papilla filling intragroup
No SSD intergroung at any time and variable

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).