Immediate Loading of Unsplinted Implants in the Anterior Mandible for Overdentures: A Case Series

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Introduction

Early loading of implant-retained mandibular overdentures has shown good success when opposing a maxillary denture. However, there are limited studies regarding the immediate loading of unsplinted implants retaining mandibular overdentures.

Purpose

This case series evaluated the implant success rate and peri-implant tissue response of immediately loaded mandibular overdentures using two unsplinted implants with a fluoride-modified micro-roughened titanium surface.

Methods and Materials

Patients and treatment protocol: Eight (5 male; 3 female) completely edentulous patients with the mean age of 69.1 (range = 58 – 82) years old from the Loma Linda University School of Dentistry patient population participated in this study. All participants received new maxillary and mandibular complete dentures prior to implant placement. Two 4.0 x 13 mm threaded OsseoSpeed™ (Astra Tech Inc., Waltham, MA) implants were placed mesial to the mandibular canine position with the use of a surgical template. Locator™ (Astra Tech Inc., Waltham, MA) abutments were torqued to 25 Ncm and primary closure was achieved with a nonresorbable suture material. The attachments were picked up with repair resin and light-retention (1.5 lb) inserts were placed. Post-operative instructions were reviewed with the patient.

Data Collection: The following parameters were recorded at the time of implant placement 0-, 3-, 6-, and 12-months after surgery: implant success rates (Smith & Zarb 1989), marginal bone level changes via standardized periapical radiographs, Periotest values (PTV), modified plaque index (Mombelli et al 1987), surgical and prosthetic complications.

Marginal bone level changes were measured from an established reference line. The junction between the micro-roughened surface and the machined surface was used as the reference line (RL) [Fig. 7A]. The value was positive when the implant-bone contact point was more coronal than the RL and was negative when the implant-bone contact point was more apical.

Statistical Analysis: Marginal bone levels were recorded for both the mesial and distal sites for each implant from the RL. The Paired Samples-Test was utilized to evaluate marginal bone level changes and the Wilcoxon Signed-Ranks Test was used for Periotest values. The level of significance was set at α = 0.05.

Results

After one year of function, all implants (16/16) were stable and none had lost osseointegration, which corresponds to an overall implant success rate of 100%. The mean marginal bone level change at 0-, 3-, 6-, and 12-months were 0.14 ± 0.38, -0.16 ± 0.18, -0.19 ± 0.20, and -0.22 ± 0.21 respectively (Table 1). The mean PTV following 0-, 3-, 6-, and 12-months were -5.00 ± 2.60, -5.94 ± 1.18, -6.38 ± 0.74, and -6.94 ± 0.73 respectively (Table 2). Modified plaque index scores showed improved oral hygiene over time (Table 3). Surgical complications included rotational instability of two implants (2/16) at the time of surgery. One of the two implants was replaced with a larger diameter implant (4.5 x 13 mm) due to the lack of primary stability. Prosthetic complications included abutment loosening on one implant at five months and the installation of new attachment inserts for two patients at their one-year recall examination.

Conclusions

Within the limits of this case series, two immediately loaded unsplinted implants in the mandibular symphysis area supporting and retaining an overdenture can result in a favorable implant success and peri-implant tissue response. Nevertheless, a larger sample size with a control group and a long-term follow-up will undoubtedly provide more insightful evidence on the viability of this procedure.

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References