

Oral rehabilitation with dental implants submitted to immediate load. Clinical Case Report.

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Purpose

The purpose of this article is to report a clinical case where the immediate load was employed in the rehabilitation of the partially edentulous mandible and maxillae.

Introduction

The initial protocol, well established by Adell et al. (1981), led to the clinical success of the osseointegrated implants. With the development of implant surfaces, the initial protocol was adapted in order to immediate load implants in the mandible and support fixed provisional prosthetic devices (Ganeles et al., 2001), as well as to apply the protocol to partial edentulism with a high rate success (Steenberghe et al., 1990). The literature describes a number of successes related to immediate load dental implants, and proposes guidelines to achieve clinical success including adequate number and distribution of implants, primary stabilization, rigid provisional splinting and physiologic occlusal scheme (Salama et al., 1995; Levine et al., 1998; Tarnow et al., 1997). The expression immediate load, according to the literature, can be used as a period of time from the day of the surgery until 20 days post-surgery (Beagle, 2006). During this period of time, the immediate load can be used with high rate success. Randow et al. (1999); reported an 18-month follow up observation with implants submitted to immediate load and a two stage protocol in edentulous mandible. The bone support mean loss was 0.4mm in the immediate load group when compared to a mean loss of 0.8mm in two stage group. Cecchinato et al. (2004); in a study using immediate load and standard protocol in partially edentulous arches indicated that the periimplant bone level does not seem to change due to the immediate load compared to the standard protocol. Implant surface and design have been changed in order to provide superior surface area, greater bone to implant contact, earlier cell adhesion and calcification, higher primary stabilization and as a result immediate implant load (Randow et al., 1999; Lopes et al., 2004; Ormianer & Palti, 2006, Romeo et al., 2006; Misch et al., 2006).

Material and methods

The patient came to the Department of Oral Implantology of Cetao complaining of aesthetics and functional problems. She was 58 years old, non smoking, and related good general health. During clinical exam, it was detected the absence of posterior teeth in both mandible and maxillae and a periodontal problem in the front superior teeth (fig. 1). As consequence, the patient presented a severe overjet and overbite (fig. 2).

It was proposed to rehabilitate the patient with dental implants and immediate load with provisory resin prostheses, and six months latter, install the definitive prostheses rehabilitation.

Patient assessment included a medical and oral story, panoramic radiography (fig. 1), linear tomography and a routine blood examination. Previous to surgery, impressions were made (Elite HD® putty, Elite HD® light body, Zhermack, Italy) of both arches and the maxillo/mandibular relation was transferred to the semi-adjustable articulator. The diagnostic wax up was performed by a laboratory and a resin provisory prostheses and a surgical acrylic guide were made (figs. 3 and 4).

The implants used were from BTLock Locking System®, (Vicenza, Italy). The BT Tite One® implants have a conic shape and a periodontal neck 0,2 mm larger than implant diameter. It improves marginal closure and increases primary stability. Also machined-cut neck 1,6mm high doesn't interfere with the osseointegration and with soft tissue repair. The conicity of the implant reproduces the natural root shape, especially in post extraction sites, and the threads are designed to optimize the distribution of chewing forces. Implant surface is a combination of a mechanism that involves sandblasting and acidetching technique. Implant system is color coded; it means that all components are featured by a specific colour indicating the diameter, therefore facilitating the prosthetic stage. The implants used in this case were from three different diameters, 3,3mm (green code) 3x75mm (yellow code) and 4,5mm (blue code).

Surgery and provisory rehabilitation

Surgery followed the implant manufacturer's protocol. Antibiotic prophylaxis was followed (amoxicillin 500mg, 2 hours before surgery at first, and 5 days postoperatively).

The first surgery was performed in order to place dental implants in both sides of the posterior mandible and immediate load the implants. Under a local anesthesia a 15 blade was used for mucosa incision at the surgical site. A fullthickness flap was made exposing the bone implant site. Due to the lack of posterior teeth the surgical guide was positioned in the retro molar region and supported by anterior teeth (fig. 5). Sequential drilling was performed following the surgical guide under copious saline irrigation, as well as implant placement in both mandible sides. It was possible to insert three implants in the right side and two in the left. Teeth replacement and implants dimensions were: tooth 34, implant 3,75mmx13mm, tooth 35, implant, 3,75x13mm, tooth 36, implant 4,5mmx13mm; tooth 45, implant 4,5mmx13mm and tooth 46 implant 4,5mmX13mm. The system is color coded, so is very simple to visualize de diameter of the implant to facilitate choosing abutment diameter. Also the internal connection has a twice-antirotational mechanism® (BTLock®, Vicenza, Italy) that is very easy to handle and dismiss the periapical RX to verify the abutment and implant fit (fig. 13). Prior to flap closure, abutments (shoulder abutment, BTLock®, Vicenza, Italy indicated for high occlusal stress) were positioned (fig. 6) and resin rings (hand made after the surgery with Duralay® resin) placed in each abutment (fig.7). Flaps were closed with a 4.0 mononylon suture (Johnson & Johnson). The provisory crowns were made hollow inside so, by adding small quantities of resin (Duralay®, Polidental), it could be adapted to the ring positioned on the respective abutment in the pre-established occlusion (fig. 8). The provisory was polished and cemented with temporary cement (Temp Bond®, Kerr). The right side received three implants and crowns and the left two (fig. 9)

Second surgery was performed in the maxilla following the surgical technique described by Beagle (2006), and the implant manufacturer's protocol. After the local anesthesia, a 15 blade was used to create a sulcular and vertical releasing distal incision. A full flap was elevated in order to expose bone tissue and

visualize any pathology present at the apical area. No pathology was found during the procedure. Teeth extractions were made carefully to avoid trauma to the surround bone and mucosa (fig. 10). The remaining periodontal ligament and granulation tissue were removed using curettes and rotatory instruments. Initial drilling was performed with a 2mm pilot bur, and the osteotomy made at least 2mm above the apical portion. After that, a digital bone expander (BTLock Expander®, Vicenza, Italy) was used to improve bone compactation and prevent bone loss by additional drilling (fig. 11). It was possible to insert six implants with three different diameters (tooth 11, 3,75mmx13mm, tooth 12, 3,75mmx15mm, tooth 13, 3,75mmx11,5mm, tooth 21,3,75mmx11,5mm, tooth 23, 3,3mmx13mm, tooth 24, 4,5x13mm) (fig. 12). Abutments (aesthetic angled abutment®, BTLock, Vicenza, Italy) following the color code were positioned and the same procedure described to adapt the provisory in mandible was performed to adjust the provisory in maxilla (figs. 14 and 15) The provisory was polished and cemented with temporary cement (Temp Bond®, Kerr). Healing was uneventfully and suture was removed ten days after surgery. Patient was very satisfied with the result even with temporary prostheses (fig. 16).

Prosthodontic permanent rehabilitation

After six months, patient returned to the clinic and the prosthodontic treatment continued. Impressions of abutments were done (Elite HD® putty, Elite HD® light body, Zhermack, Italy) after positioning transfers and retaining caps (BTLock transfer® and BTLock retaining cap®, BTLock®, Vicenza, Italy). The retaining cap facilitates fitting the analogue during cast fabrication (fig.17) Individual metaloceramic crowns were made for both mandible sides (figs. 18 and 19) The prostheses were cement retained (Temp Bond®, Kerr). Rehabilitation of maxilla was done with a metaloplastic prosthesis (more appropriate to the mastigatory stress in this particular case) and followed the same impression protocol that was used for the lower arch. A metal frame was made and passively adapted to the implants. Teeth selection (Artplus IPN®, Dentsply, Brazil) was done until the patient relates satisfaction with the esthetics and phonetic results. Due to the lack of supported tissue, an artificial resin

gingiva was used to improve aesthetics condition (fig. 18) The prosthesis was cement retained (Temp Bond®, Kerr) since the patient will have to return every six months, to remove the prosthesis and have a professional cleaning.

Patient related a high degree of satisfaction with the final rehabilitation. All the prostheses were cement retained giving to patient a high level of comfort and self confidence with the treatment. Patient was also advised to follow a severe oral hygiene.

Result

It was possible in just two-step surgery to rehabilitate the patient, using the immediate load protocol. The surgery performed allowed a favorable position of the implants due to the surgical guide in the mandible and the maxilla implants could be positioned inside root sites. Expander technique enhances bone quality to achieve a strong primary stabilization in maxilla. Treatment success occurred due to the prosthetics and surgery planning and the occlusal relation that was achieved in both provisory and permanent prostheses. The method is economical due to the temporary prosthetic material (resin crowns) and the abutment can be used for both provisory and permanent prostheses. In addition, it is quite easy to adjust the provisory to the abutment due to the hand made ring.

A balanced occlusion was achieved due to the immediate installation of dental implants and provisory resin crowns. The patient became more self confident and satisfied with her smile, appearance and function.

Conclusion

The use of immediate load technique at the time of surgery is a predictable treatment for both mandible and maxillae. Following a retrospective planning is the key for immediate load success.



Fig. 1. Patient, vestibular view and panoramic RX



Fig. 2. Patient, lateral view.



Fig. 3. Resin provisory prostheses positioned in cast.



Fig. 4. Surgical guide positioned in cast. Note the retromolar support.



Fig. 5. Surgical guide with the color coded pilot drills positioned.



Fig. 6. Color coded shoulder abutments.



Fig. 8. Provisory and rings.



Fig. 7. Rings in position.



Fig. 9 Provisory positioned.

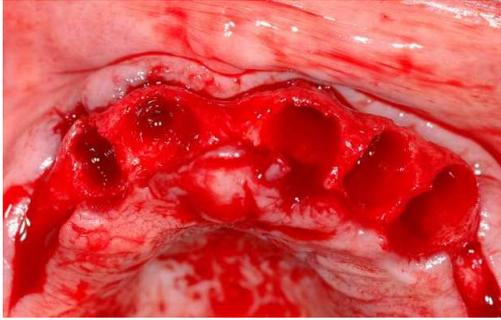


Fig. 10. Maxilla after teeth extraction.



Fig. 11. Expansion technique using manual expander.

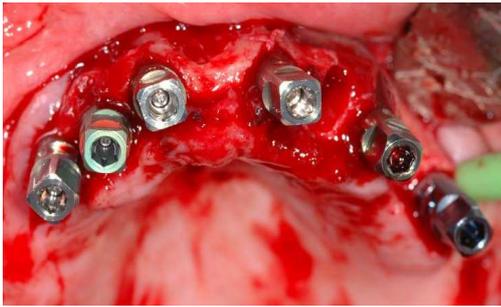


Fig. 12. Implants and mounts positioned. Note the colour code of the mounts indicating implant diameter.



Fig. 13. Implants positioned. Note the internal connection of the implant.



Fig. 14. Resin rings positioned.



Fig. 15. Adaptation of the provisory and the rings.



Fig. 16. Final aspect immediate postoperative.



Fig. 17. Transfers with the retained cap in lower arch (after six months).

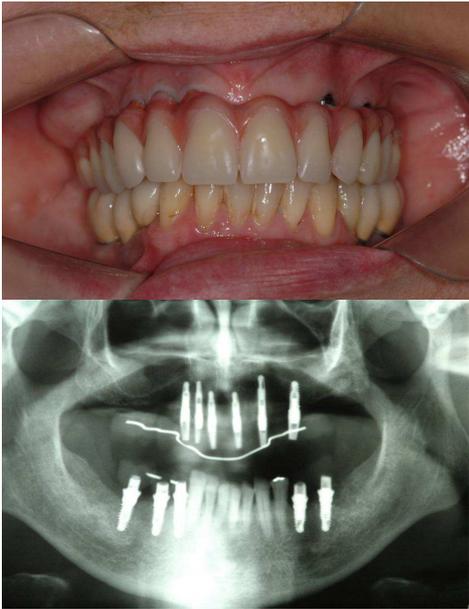


Fig. 18. Final rehabilitation and panoramic RX.



Fig. 19. Final rehabilitation. Occlusal view.

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