

Immediate loading of post-extractive Implants in fully and partially edentulous arches: how and when stabilize the fixtures.

Francesco Romano - Centro Odontoiatrico V. Romano - Palermo - Italy

Background

Sometimes it happens that the patient needs, for aesthetic or functional reasons, a prosthetic immediate loading to be done, over the fixtures just inserted, at the same time that the extraction of compromised teeth. According to Brånemark, the surgical trauma together with the immediate load of the implant would provoke the development of the covering scar tissue in the implant/bone interphase¹. Experimental studies in the 90's have invalidated this theory as fibrous tissue was not found in the interphase²⁻³. Furthermore nowadays is scientifically evident that the immediate loading improve the bone regeneration and osteointegration around the loaded implants⁴. Anyway is fundamental - and not even easy, above all in implants inserted in fresh extraction sockets - to reach the sufficient primary stability and avoid the micromovement of the fixtures over the 150 μ s, responsible of the lack of osteointegration⁵. A special caring has to be put to avoid failures, often owed to many factors like unsuitable surgical technique, lack of indications, misfit of the prosthetics components, presence of micro movements of the fixture or absence of stabilization of implants after surgery.

Aim of the work

According to some authors, the immediate loading would compromise the primary stability of a single implant⁷. However, the splint of several implants in the mandibular or maxillary zone will permit the early function of prosthesis⁸. In this Poster the Author propose an easy method to obtain great precision, to avoid tension and misfit between the implants and to maintain the stability of the immediate loaded implants after surgery, during the delicate prosthetic provisional phase of the rehabilitation.

Material and Methods

Between July 2012 and July 2015 a series of 25 dental implants (Bone System, Milan, Italy), inserted in 5 surgical session, over 4 patients, have been selected and followed up for a period ranging from 14 to 50 months (average period 36 months) after prosthetic loading.

Fifteen of them were positioned in fresh extraction sockets and ten in healed sites. Of these, 22 implants were loaded immediately at surgery (12 of the inserted in fresh extraction sockets and 10 in healed site; see TAB 1). An implant failed after 3 months from surgery, but, since it was loaded its inclusion in the study. Another fixture, perfectly osteointegrated, remained covered because in a position not allowing a correct connection. These two implants were of the same patient: a diabetic, high blood pressure sufferer of 75 years old male.

The technique here illustrated is a modification of the intraoral syncrystallization proposed, in different versions, by Mondani (1982)⁹, Degidi (2006)¹⁰ and Assenza (2010)¹¹.

All the patients were selected and instructed to an excellent level of oral hygiene. Sedation was used in each surgical session. Two interventions considered a contextual GBR. In one case, the bone augmentation was carried out 6 months before implant surgery. After the tooth extractions, where needed, the fixtures has been positioned according to the usual surgical guidelines. A ST trans mucosal collars with \varnothing of 4.6 mm has been positioned on each implant to load (fig. 3) and on the top of it a titanium hub was inserted and fixed with its own screw (fig. 4). All the screws were screwed using the dynamometric instrument, with a torque of 20 Ncm.

At this point a spongy dental floss (Super Floss, Oral B, Procter & Gamble) was passed around the hubs (fig. 5) and fixed to them with a cyanoacrylate instant glue. An auto-polymerized resin (Duralay Red Small, Dental Mfg. Co. IL) was spread all over the floss (fig. 6). After that the resin become harder, a sterile pick-up impression method of the prosthetic framework was taken (fig. 7).

The dental technician could so replicate with great precision, and avoiding any misfit, the exact position of each implant at the lab. After that, he took off the Duralay frame and weld the titanium plate to the hubs to provide great solidness to the acrylic provisional prosthesis. The provisional restoration was fabricated and delivered after 4/6 hours. After finishing, polishing, and the occlusion adjusted, it was delivered to the patient. It was functional at the same day of the delivery (fig. 8 and 9).

An Orthopantomography was taken in all patients, just before the delivery, in order to verify the correct assessment of the provisional restoration to the trans mucosal collar and to the fixture. The definitive prosthesis was executed 4/8 months after surgery, depending from the different situation of each patient, and clinical and radiographic control has been done at the planned times.



fig. 1 - One of the patients treated



fig. 2 - Surgeries has been made at the lower and, (after 3 months) at the upper jaw



fig. 3 - Titanium provisional cup inserted to each fixture with titanium screw



fig. 4 - Upper jaw: after tooth extraction and immediat implant placement



fig. 5 - Normal Dental Floss, fasted with instant adhesive, embracing each titanium hub

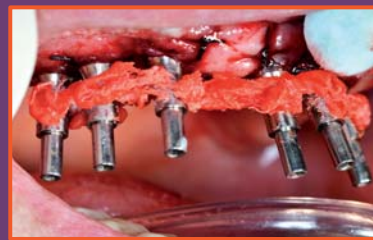


fig. 6 - Duralay resin cover the dental floss and, becoming harder, stabilize the whole structure allowing a more precise impression



fig. 7 - Great precision is owed to the stabilization sistem: can see the red Duralay resin between the titanium hubs, included inside the dental impression



fig. 8 - Provisional prosthesis without any misfit is applied in the same day than surgery



fig. 9 - Patient smile at the end of provisional phase (characterization in this first phase reflect the preexisting prosthesis of the patient)



fig. 10 - Follow up at 4 years



fig. 11 - Radiographic follow up at 4 years



fig. 12 - Patient smile lines at 4 years

Results

At the 6-12 months 3 years follow up, the success rate was 96,0 %. No fracture of any provisional prosthesis has been reported. At the radiographic control, the crestal bone resorption levels around the implants stabilized with this system, resulted similar to the single tooth or two phases implants reported in literature. In addition, the correspondence to the Albrektsson's criteria, for determining the success of oral Implant, showed comparable rates.

Conclusions and clinical implications

Success keys are not always easy to achieve in immediate loaded implants, inserted in fresh extraction sockets. Based on the result of this work, the only post-extractives implants to load immediately have to show simultaneously these four factors:

1. Primary stability of the fixture: Torque ≥ 25 Nmc (this value can be sufficient only when the following criteria n. 2, 3 and 4 are presents).
2. $\geq 50\%$ of the fixture height must have been inserted in native bone.
3. The stabilization of the fixture has to be done with an armed/reinforced fixed provisional prosthesis, and within 24/48 hours after surgery.
4. The stabilization method has to guarantee the complete absence of micro movements over the 150 μ m.

Patient	Fixture inserted (immediately loaded)	In fresh extraction sockets (immediately loaded)	In healed site (immediately loaded)	Follow up in months
1	6 (6)	2 (2)	4 (4)	48 m
2	8 (5)	5 (2)	3 (3)	50 m
3	3 (3)	-	3 (3)	50 m
4	4 (4)	4 (4)		16 m
5	4 (4)	4 (4)		16 m
Tot	25 (22)	15 (12)	10 (10)	180 m (average 36m)

¹ Brånemark PI. Introducción a la osteointegración. En: Brånemark PI, Zarb G, Albrektsson T, eds. Prótesis Tejido-integradas. La Osteointegración en la Odontología Clínica. Barcelona: Quintessence SL; 1999. p. 11-76.

² Sagara M, Akagawa Y, Nikai H, Tsuru H. The effects of early occlusal loading on one-stage titanium alloy implants in beagle dogs: A pilot study. J Prosthet Dent 1993;69:281-8.

³ Piatelli A, Corigliano M, Scarano A, Costigliola G, Paolantonio M. Immediate loading of titanium-sprayed implants: an histologic analysis in monkeys. J Periodontol 1998;69:321-7.

⁴ Romanos GE. Wound healing in immediately loaded implants. Periodontol 2000, 2015, June; 68(1): 153-67.

⁵ Szmaluk-Moncler S, Salama H, Reingewirtz Y, Dubrille JH. Timing of loading and effect of micromotion on bone-dental implant interface: review of experimental literature. J Biomed Mater Res 1998 Summer;43(2):192-205.

⁶ Bruns JB. Avoid pitfalls of overloading and micromotion of intraosseous implants (interview). Dent Implantol Up-date 1993;4:77-81.

⁷ Macglin B. Dificultades y complicaciones. En: Schroeder A, Sutter F, Krekeler G, eds. Implantología Oral. Madrid: Editorial Médica Panamericana S.A.; 1993. p. 331-43.

⁸ Uribe R, Peñarocha M, Balaguer J, Fulgencias N. Immediate loading in oral implants. Present situation. Med Oral Patol Oral Cir Bucal 2005;10(Suppl 2): E143-53.

⁹ Mondani PL, Mondani PM. The Pierluigi Mondani intraoral electric solder. Principles of development and explanation of the solder using syncrystallization. Riv. Odontostomatol e Implantoprotesi. 1982; 4:28-32.

¹⁰ Degidi M, Gehrke P, Spanel A., Piatelli A. Syncrystallization: a technique for temporization of immediately loaded implants with metal-reinforced acrylic resin restorations. Clin. Implant Dent Rel Res 2006; 8:123-134.

¹¹ Assenza B. Carico immediato: una metodica di splintaggio degli impianti associabile a tecniche rigenerative dei tessuti duri. Doctor OS, 2014, XXV (5), 2-10.

