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# Intraorally welded titanium bar for immediate restoration in maxilla: Case report and review of the literature

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## **ABSTRACT**

Oral rehabilitation of edentulous maxilla is particularly difficult because of the lack of bone in correspondence of maxillary sinuses. Therefore, surgeon is forced to place implants in sites where bone is more prevalent. In addition, patients require more frequently oral immediate rehabilitation in order to reduce the discomfort related to wearing a total denture. A viable solution to provide stability and retention of the prosthesis in a short time, is represented by the technique of intraoral welding systems supporting total denture or fixed prosthesis. This goal may be achieved thanks to the technique of welding titanium bars on implant abutments. In fact, the procedure can be performed directly in the mouth eliminating possibility of errors or distortions due to prosthetic procedures. This paper describes a case report and the most recent data about long-term success and high predictability of intraorally welded titanium bar in immediate loading implants.

**Keywords:** welded titanium bars; immediate loading implants; oral rehabilitation.

## Introduction

Immediate loading of implants is a proven technology in oral surgery. It has been demonstrated that it is possible to reduce healing time and immediately load implants with prosthesis in the same day of surgery, exposing implants to occlusal and muscular forces, without failures<sup>1-4</sup>. In case of immediate loading, adequate fixation and immobility of the implants are of utmost importance to prevent the risk of micromovements with regard to surrounding bone<sup>3</sup>. In fact perimplant bone reshapes itself according to the force exerted, and an optimum distribution of forces, both at the level of implants and of prosthesis, is an essential requirement for a successful oral rehabilitation. So, in case of immediate loading, adequate fixation and stability of implants are a very important conditions to prevent the risk of micro-movements and loss of implants. In this context, a rigid splinting seems to have an important role in the response of periimplant tissues, since it is able to reduce stress on implants.

The immediate fixation of more implants can be achieved by intraoral welding of abutments. Intraoral welding allows to get immediate retention of osseointegrated implants. This method consists in welding a titanium bar directly to the abutments in the oral cavity before immediate loading. Otherwise with this method, many steps related to prosthetic procedures are eliminated, reducing patient discomfort and achieving functional and aesthetic results<sup>5-6</sup>.

This method was introduced by Degidi and coll.<sup>1-8</sup>, which have published numerous studies about immediate loading of multiple implants by welding a

titanium bar directly on abutments in order to create a metal-reinforced temporary or definitive restoration.

In 2006 Degidi and coll.<sup>1</sup> published a new method defined syncrystallization. This technique consists in splinting multiple implants with a rigid titanium bar welded on abutments. It presents the advantage of immediate restoration in the same day of surgery, stability and retention of implants in the early stages of bone healing, and less implant fractures due to reducing time of restoration. The authors finally concluded that the most reliable devices for immediate oral rehabilitation are one piece implants and intraoral welding procedure of abutments. In fact there is no reason to use the two-piece fixtures if they are immediately restored. The abutment-implant junction may represent a critical point in surgery, being the way of bacteria penetration and proliferation, thereby causing the perimplant bone resorption. Then implants could be inserted not parallel. In one-piece implant the neck can be curved, otherwise in two-piece this isn't possible. In today's dental literature, most frequently, aesthetics are addressed with fixed restorations. This technique gives the opportunity to provide our patients with very good esthetic outcomes with a hopeless dentition utilizing dental implants, introrally welded titanium components, and acrylic resin dentures. These prostheses provide excellent facial support, phonetics, esthetics, smile line, and function. Introral welded titanium frameworks offer many advantages for the patient, clinician, and dental technician<sup>9,10</sup>. This technique was then proven in atrophic mandibula and maxilla,

even if implants are placed in zygomatic bone also<sup>5,6</sup>. Infact it has been demonstreted to successfully rehabilitate the edentulous atrophic maxilla with a permanently fixed prosthesis supported by an intraorally welded titanium framework attached to standard and zygomatic implants the day of surgery <sup>5,6</sup>. The intraoral welding technique seems to have no adverse effect on marginal bone loss and implant survival also<sup>7</sup>.

## CASE REPORT

A 56 years old male came to our clinic for an examination (Figure 1). The anamnesis was negative for sistemic diseases and drugs assumption. Then it was performed a panoramic radiograph evidencing periodontal disease (Figure 2). Subsequently periodontal teeth in maxilla were extracted. Before extraction, an impression was taken to perform a provisional denture. It was decided to stabilize his denture by the insertion of six implants in the maxilla (Figure 3), and a computer guided implantology surgery was programmed with the appropriate software. Subsequently the implants were placed in maxilla in a computer guided way. The insertion of the six implants (Figure 4) was followed by screwing six abutments on implants (Figure 5). Then, a bar previously constructed by the dental technician, (Figure 6) was welded intraorally (Figure 7) in order to fix the position. The bar was removed from the mouth with the abutments (Figure 8) and covered with pink opaque (Figure 9). The prosthesis was then connected to the bar with acrilic resin (Figure 10). The patient was

checked after two days, and fifteen days and during this period no problems were noted (Figures 11-12-13).

## CONCLUSION

The lack of stability and retention are responsible for oral complains associated with dentures. Immediate loading implants with definitive denture have demonstrated long-term success and high predictability. It's known that immediate loading exerted at the implant interface may interfere with the process of bone healing and lead to failure. Otherwise acrylic resin restoration may suffer fractures and luting cement failure. Therefore, stability and rigid fixation of implants and abutments are essential for maintaining the rigidity of provisional restorations on immediately loaded implants on the long term<sup>3</sup>.

Rigid splinting of multiple implants with intraoral welding technique results in a predictable fixation in the early stage of bone healing with a significant reduction of the micromovement problem and implants loss.

Another interesting aspect of welding technique is related to inflammatory and reparative processes. A recent study evaluated, with histologic and immunohistochemical analysis, inflammatory infiltrate, microvessel density, vascular endothelial growth factor, nitric oxide synthase, and proliferative activity in soft tissues below intraorally welded titanium bars, concluding that these tissues underwent a higher rate of inflammatory and reparative processes<sup>11</sup>, not differently respect to control group.

Finally titanium bars intraorally welded on prostheses is now a widely proven technology and allows the stabilization of fixed prostheses in edentulous ridges that otherwise could not be rehabilitated, improving the quality of the results, reducing the operative time, and giving greater comfort to the patients.



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Fig.1 : Oral cavity with periodontal teeth.

Fig. 2: OPT with periodontal teeth.

Fig.3: Computer-guided implants technique.

Fig. 4: Implants positioned in the maxilla.

Fig. 5: Abutments screwed to implants.

Fig. 6: Titanium bar constructed by the dental technician

Fig. 7: Titanium bar welded on abutments.

Fig. 8-9: Titanium bar removed from mouth and covered with pink opaque.

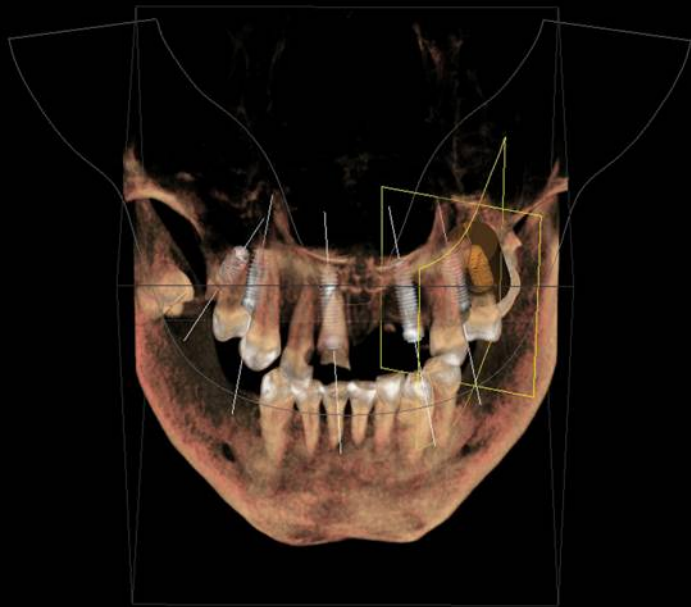
Fig. 10: Titanium bar fixed to the denture with acrylic resin.

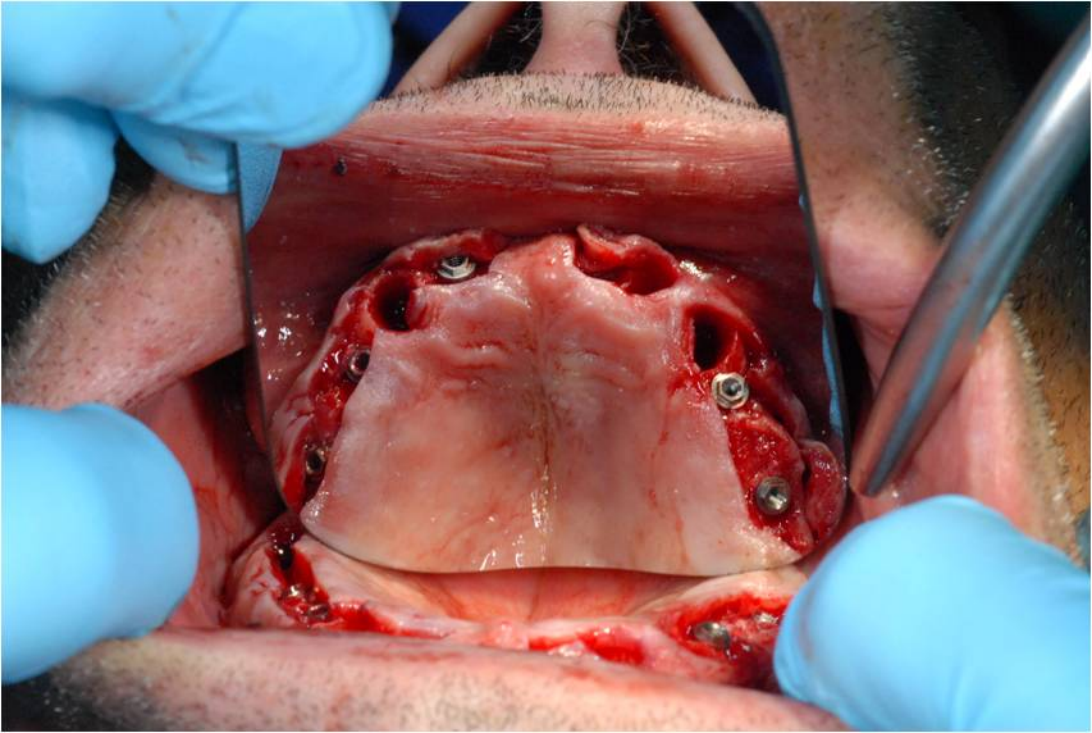
Figs. 11-12: Final restoration.

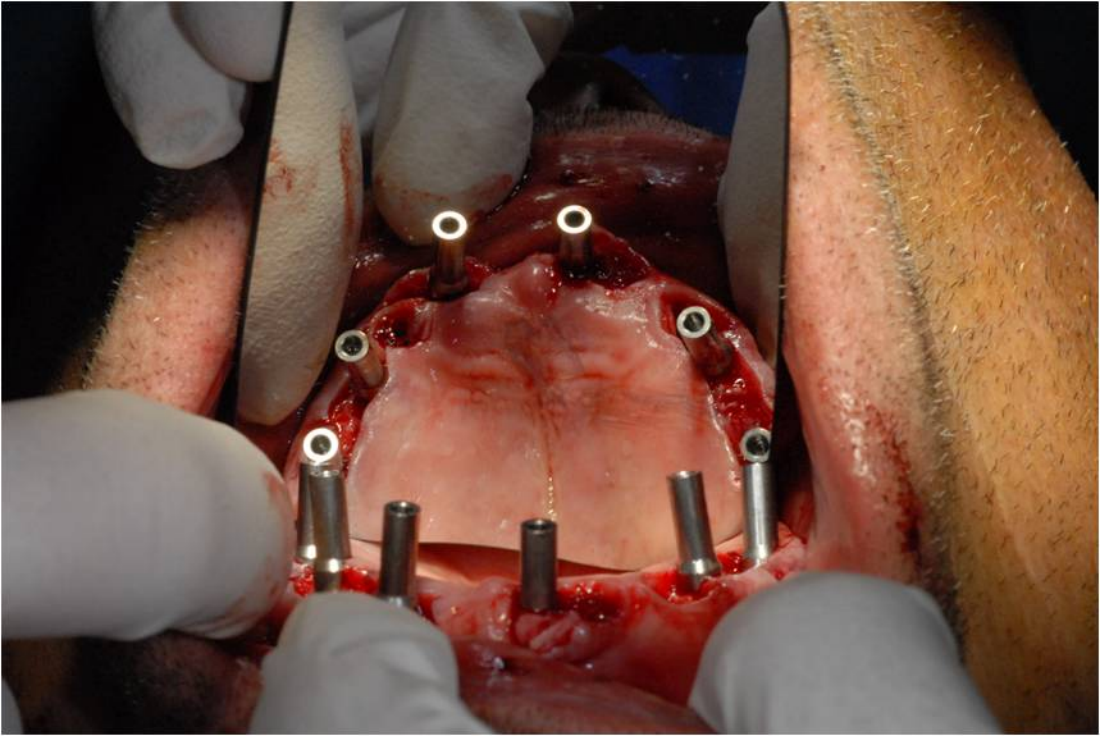
Fig. 13: Final OPT.













*LINEA MEDIANA*



