

# Temporary Implants and Particulate Dentin Graft Protecting Traditional Implants in Severe Periodontal Patient: A Case Report

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## Abstract

Provisional implants (PIs) can offer a total contribution to a patient's esthetic comfort and chew during the integration of standard implants. Although temporary implants are not intended for osseointegration and have to withdraw at there or 4 months, most of them begin to move during this process, and most of them had extracted before standard implants integration. Resin fixed prosthesis attached to temporary implant abutments gives the patient stability, gives esthetics, and gives protection to traditional implants, compared to removable prostheses, which more quickly leads to the loosening and loss of these temporary implants. Temporary implants could be used with cemented or screwed resin prosthesis or with titanium framework, depending on the patient's bite, bruxism, or clenching. All PIs are made in one piece, titanium grade 5, with V threads and a Bioetched surface (rough surface) to increase the insertion torque and bone to implant contact in soft and hard bone. Temporary upper fixed denture, relined with resin, is the easiest solution for protecting and reducing the risk of failure of some of the standard implants. The possible solution in such cases is the use of temporary implants as support for the fixed structure, acting as protection of traditional implants and bone grafts. Our clinical case was made with six temporary implants TR<sup>®</sup> 2.7 mm diameter by 13 mm length, grinding extracted teeth using smart dentin grinder, and fixed temporary denture for 3 months. At 4 months, a complete zirconium denture was screwed in standard implants.

**Keywords:** Dentin grafts, particulate dentin graft, particulate tooth graft, temporary implants, TR implants, transitional implants

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## INTRODUCTION

Transitional implants were developed to support an implant-supported fixed prosthesis or overdenture to provide retention, stability, and support.

Placing the definitive implants submerged without doing an immediate load needs to go through a healing phase of 3–6 months depending on whether it is in the maxilla or mandible.<sup>[1,2]</sup>

This load will depend essentially on the quality of the patient's bone and the patient's medical conditions. In the edentulous maxilla, hard tissue limitation appears to require a minimum of six implants to rehabilitate the patient's mouth.<sup>[3]</sup>

Although implant shape and implant surfaces have brought many positive changes to speed up the healing phase, it is hazardous in some cases to load the implants immediately.<sup>[4]</sup>

These complete dentures placed immediately can produce micromovements and increased loads on top of implants and within the bone with the risk of losing them.<sup>[5]</sup>

Provisional implants (PIs) have been developed for temporary restoration and immediate rehabilitation prostheses, avoiding the burden of traditional implants and can allow rapid rehabilitation by ensuring adequate stabilization of the overdenture. Krennmaier is one of the researchers who have used the most PIs in the maxilla and edentulous mandibles with a high long-term success rate of 6–10.

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This clinical case evaluated how the PIs serve to maintain the temporary prosthesis's esthetics and function, allowing them to be loaded to obtain maximum comfort and patient satisfaction protecting definitive implants.

## CASE REPORT

A clinical case of a 62-year-old woman is presented, with no significant medical history, which offers absence of some upper teeth in the maxilla with heavy periodontitis and a single implant without loading [Figure 1].

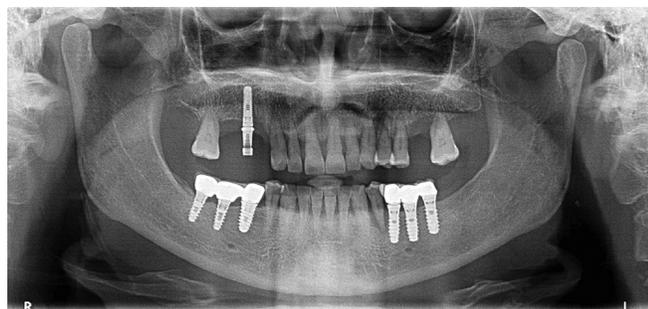
The intraoral cone-beam images showed severe periodontitis in the upper jaw with enough space to place implants in the upper posterior areas. The jaw presents mobility of Grade 1 in all front teeth and implants in rear regions [Figure 2].

A diagnostic wax-up, study plaster models, and a plaster model of the diagnostic wax-up made a three-dimensional printing model and vacuum splint for immediate provisionals [Figure 3a and b]. The intraoral image showed severe periodontal problems with some areas without papillae [Figure 4].

The temporary TR implants (Bioner Sistemas Implantológicos, Barcelona, Spain) were used for the temporary denture. They have a polished neck of 2.3 mm, 2.7 mm diameter by 13 mm length [Figure 5a and b].

The treatment plan was to extract all maxillary and the unloaded implants, and after that, eight immediate implants were placed [Figure 6a].

A full-thickness flap and exposure of the maxillary alveolar bone were done, and eight Top DM® implants (Bioner Sistemas Implantológicos, Barcelona, Spain) were placed for fixed prostheses [Figure 6b and c].



**Figure 1:** Panoramic radiograph showed heavy periodontitis on the upper jaw



**Figure 3:** Three-dimensional printing model for temporary upper fixed teeth

Six temporary TR® were placed to protect definitive implants from harmful loads during the healing process [Figure 6d].

The extracted teeth were polished, and the periodontal ligament was removed with a tungsten carbide bur to be later crushed. The teeth were placed in the Smart Dentin Grinder® (Kometabio NJ, USA, Distributor Bioner Sistemas Implantológicos, Barcelona, Spain) to be ground and used as a bone graft in the defects left by the extracted teeth [Figure 7a-c].

Particulate dentin graft was used to fill bone defects and covering buccal and lingual plates, Silk stitches were used to close the wound (3.0, Lorca Marín, Murcia, Spain), a rubber dam is then placed and passed between the TR abutments to place the temporary vacuum splint in the upper maxilla with temporary resin Structure Premium® (Voco, Germany) used for an interim prosthesis [Figure 8a-d].

The orthopantomography was performed where eight traditional implants were observed in the upper jaw, protected by the six TR implants that support the provisional resin prosthesis, ensuring the postextraction implants' success [Figure 9].

After 3 months, transitional implants were removed from the mouth, and impression techniques were used for the laboratory framework. An abutment checking process was done before the zirconia fixed screwed prosthesis be tight [Figures 10 and 11].

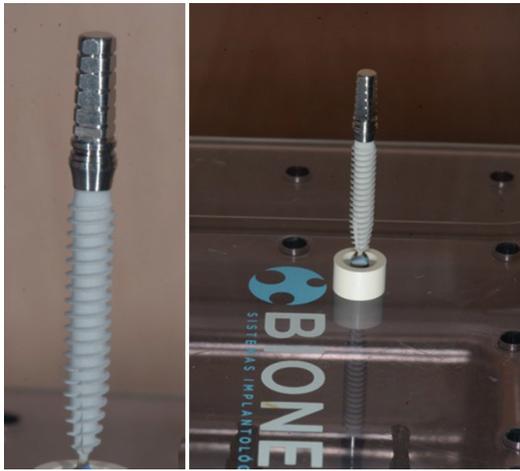
Subsequently, panoramic control radiography was performed where the correct adjustment of the bar made by computer-aided



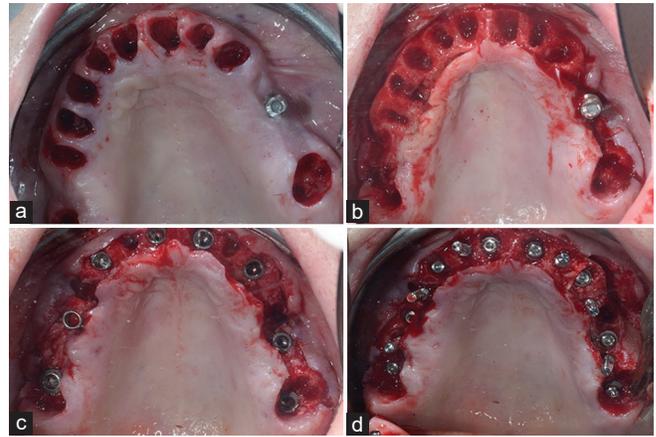
**Figure 2:** Cone beam showing a bone loss in maxilla



**Figure 4:** The intraoral image which shows periodontal problems



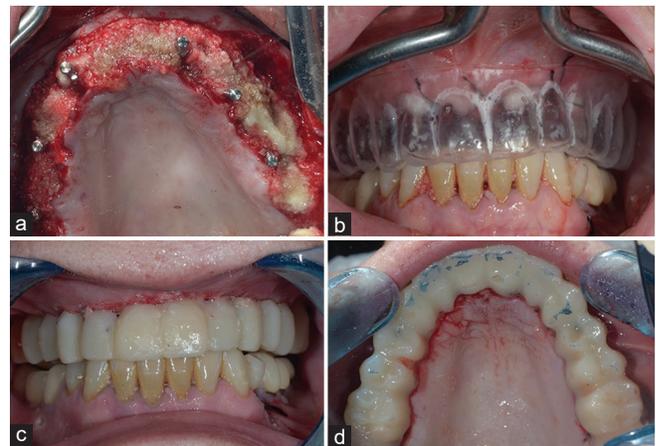
**Figure 5:** Temporary Implant TR<sup>®</sup> 2.7mm diameter by 13 mm length (Bioner Sistemas Implantológicos, Barcelona, Spain)



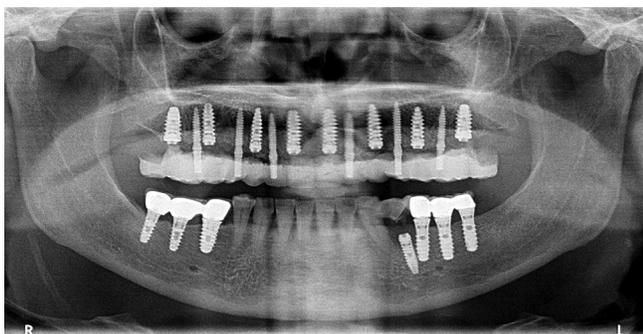
**Figure 6:** (a) Intraoral view of upper maxilla after teeth extractions; (b) mucoperiosteal flap elevation; (c) eight Top DM<sup>®</sup> Bioner implants placed for fixed prostheses; six TR<sup>®</sup> (temporary implants) in place; (d) six TR<sup>®</sup> (temporary implants) placed between definitive implants



**Figure 7:** (a) Smart dentin grinder<sup>®</sup> (Kometabio, NY, USA) used for grinding extracted teeth; (b) extracted roots into the grinding chamber; (c) particulate teeth prepare to use biomaterial covering bone defects



**Figure 8:** (a) Particulate dentin graft filling bone defects and covering buccal and lingual plates; (b) temporary vacuum splint placed in the upper maxilla; (c) quick resin used for interim prosthesis; (d) temporary teeth in place



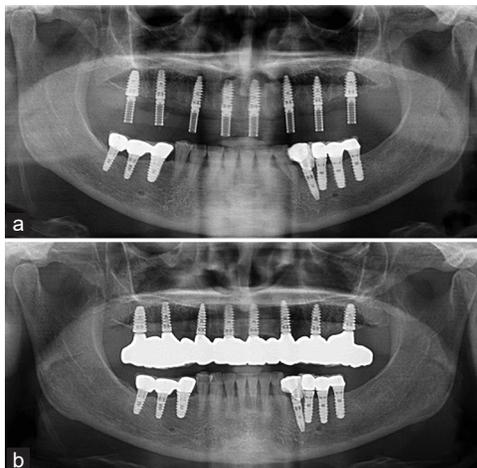
**Figure 9:** Immediate radiograph after surgery showing submerged definitive Top DM<sup>®</sup> implants and temporary TR<sup>®</sup> protecting traditional implants from harmful loads during the healing process



**Figure 10:** Zirconium complete screwed prosthesis

design-computer-aided manufacturing (Classic Dental Workshop, Murcia Spain) is observed [Figure 11b]. Ceramic teeth are kept at the lower molars level so that the patient

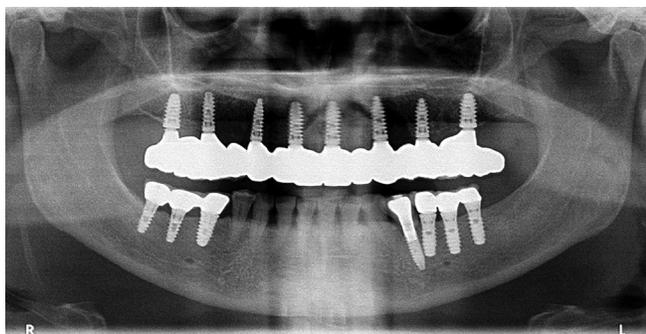
maintains the vertical dimension for time, thus avoiding prosthesis fracture and tooth breakage [Figure 12].



**Figure 11:** (a) Panoramic radiograph of abutment checking process; (b) immediate postoperative radiograph after fixed denture tight



**Figure 12:** Fixed zirconia screwed denture in place



**Figure 13:** Final radiograph of fixed denture

The final radiograph after 1 year showed the perfect adjustment of the fixed prosthesis [Figure 13].

## DISCUSSION

For cosmetic and psychosocial reasons, patients who must be without a prosthesis for long periods do not accept it. Still, the use of PIs improves comfort, chewing, esthetics, and phonetics of these patients, avoiding going through toothlessness periods. However, the literature on the use of temporary implants is scarce

and limited to clinical case reports that describe treatment with a removable partial denture for partially and edentulous patients.<sup>[6-10]</sup> Simultaneously, the present study's temporary implants are mainly designed for provisional fixed prostheses, for agenesis of upper lateral incisors and mandibular incisors. They can also be used as temporary implants in children and adolescents who have not reached prosthetic age between 14 and 17. The use of temporary implants is necessary to avoid micromovements in the definitive implants postextraction and insertion of the screw-retained or removable hybrid prosthesis, which can cause premature loss.

## CONCLUSIONS

The placement of temporary or temporary TR implants meets the requirements to place a cemented fixed immediate prosthesis, avoiding removable provisional prostheses. These implants serve to provide patient comfort and satisfaction during the traditional implants' healing, protecting them from avoiding their failure in early stages.

## Ethical clearance

No ethical clearance was necessary because the patient gave me the authorization signed in the informed consent.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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