

The NanoTite™ Implant:
A Nanotechnology-Based
Bone Bonding®* Implant

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Clinically relevant, scientifically based

* Bone Bonding is the interlocking of the newly formed cement line matrix of bone with the implant surface.

Post-extractive Implant With Early Loading In A Highly Aesthetic Area

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Fig. 1 Endoral radiograph of the initial case.



Fig. 2 Objective clinical examination of the initial case.



Fig. 3 Tooth extracted using atraumatic technique.

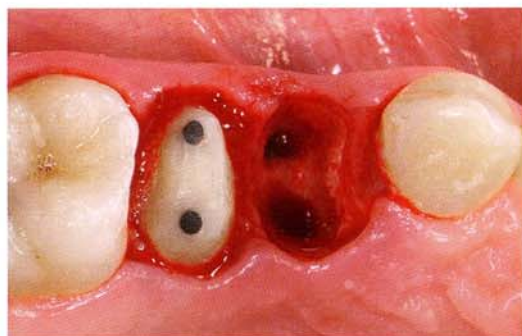


Fig. 4 Preparation of implant site in the interradicular space.



PATIENT PRESENTATION

The patient, a 34-year-old woman, came for an examination following a fracture of the dental element in the second quadrant.

The first premolar, endodontically treated, appeared to be completely decoronated, while the second premolar had also been treated endodontically and provided with a provisional resin crown. The adjacent teeth, however, were found to be healthy and vital (Figures 1 and 2).

HEALTH EVALUATION OF THE PATIENT AND DENTAL EVALUATION

- Patient ASA 1, in good health;
- coronal fracture of tooth #5;
- patient hygiene satisfactory;
- adequate thickness and volume of soft tissue profile.

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TREATMENT PLAN AND THERAPEUTIC OPTIONS

The following treatment options were proposed to the patient:

1. repeat endodontic treatment of tooth #5, clinical crown lengthening, reconstruction with a pin and a ceramic crown;
2. orthodontic extraction of #5 and the recuperation of the dental element;
3. extraction of #5 and conventional treatment with a bridge between #6 and #4 following repeat endodontic treatment of #4;
4. extraction of #5 and a fixed prosthesis on #4 with a mesial extension on #5, following repeat endodontic treatment of #4;
5. extraction of #5 and construction of a removable partial prosthesis;
6. extraction of #5 and placement of a post-extractive implant.

The first treatment plan was excluded. The option of clinical crown lengthening was discarded since the osteoplasty would remove healthy bone tissue from the adjacent teeth, changing the soft tissue profile and hence the aesthetics; the treatment plan involving an extension to endodontically treated teeth has a high fracture index and is therefore not recommended. The two treatment plans that include an orthodontic phase or a removable partial prosthesis were not accepted by the patient because of the discomfort that would inevitably accompany such therapy. Hence, it was decided to proceed with extraction of the first premolar root and the placement of a post-extractive implant with early loading.

SURGICAL PHASE

The fractured tooth was removed atraumatically while attempting to preserve the integrity of the osseous cortices, especially the vestibular cortex. For the purposes of reducing osseous reabsorption during the surgical maneuver, the entire intervention was done using a flapless approach.

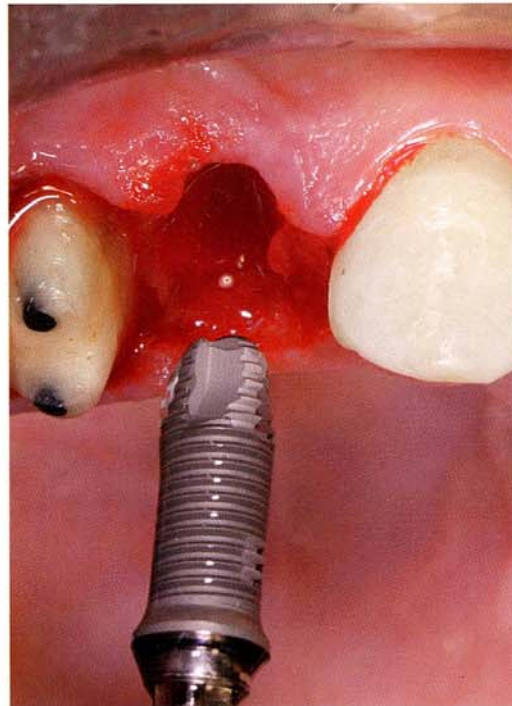


Fig. 5 The NanoTite™ PREVAIL® implant ready for insertion.

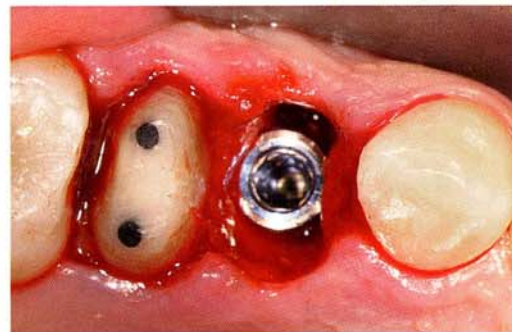


Fig. 6 Sub-crestal placement of the implant platform maintaining vestibular inclination.

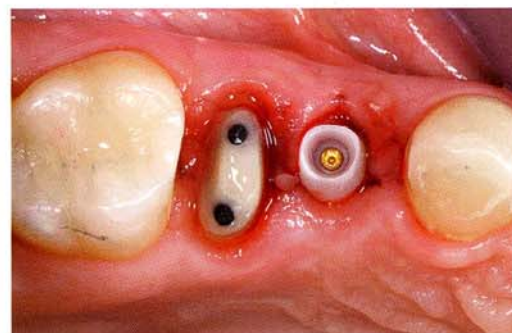


Fig. 7 The final ZiReal® Post in zirconia placed after 8 weeks.

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Fig. 8 Good integration of the final prosthesis.



Fig. 9 Final radiograph which shows limited osseous reabsorption thanks to the use of platform-switching methods.

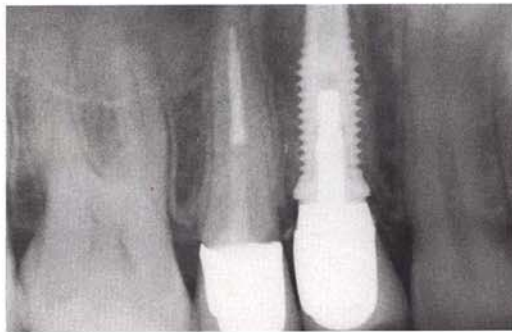


Fig. 10 The finished case.



The alveolus was then probed to evaluate the position of the residual osseous crest and to check for any fenestration occurring along the vestibular bone plate, which, in this case, was found to be absent (Figure 3). The implant site was prepared in the interradicular space, with the implant axis oriented toward the vestibular side, to reduce the gap between the implant and the external cortex. The mesio-distal axis was kept parallel to the adjacent teeth.

The implant site was prepared dynamically based on the quality of the bone in order to obtain good primary stability (50 Ncm). The implant platform was placed at the sub-crestal level (Figures 4 and 5). The implant that was

chosen has the newly created NanoTite™ Surface, which promotes bone growth and increases the percentage of bone-implant contact during equivalent healing periods (Figure 6).

The gap between the implant and the bone cortex, if less than 1-1.5 mm, can be left empty since it will heal without resorting to grafts. However, to maintain the tissue volume at the vestibular level, a heterologous graft of deproteinized bovine bone was placed in the alveolus and an impression was then taken with a biocompatible sterile radiopaque material, specifically designed for immediate loading procedures. A standard diameter (4 mm) healing post was put in place and the patient was sent home. After 8 weeks, a provisional resin crown was placed on a final zirconia-based ZiReal® Post. The provisional prosthesis did not make contact during lateral motion (Figure 7).

At 6 months from the intervention, after the final cementing of the device onto tooth #'s 5 and 4 (which was endodontically treated), the aesthetic integration of the device was good and the reabsorption of the vestibular profile was limited (Figure 8). The periimplant osseous reabsorption appeared reduced due to the platform-switching method, which was adopted when positioning a 4 mm post on the 5 mm implant platform (Figure 9).

CONCLUSIONS

When drawing up the treatment plan, the indications for clinical procedures must be carefully evaluated, especially analyzing possible therapeutic options, based on the clinical situation of the adjacent teeth, the patient's expectations, and the age of the patient.

The choice to preserve the compromised tooth by clinical crown lengthening, although feasible, would have also altered the soft tissue profile in the contiguous teeth.

In young patients and in aesthetic areas, the utilization of post-extractive implants with the new NanoTite osteoconductive surfaces can facilitate accelerated loading,* thereby achieving highly satisfactory aesthetic results (Figure 10).

*NanoTite Implants may be used for immediate function on single tooth and/or multiple tooth applications when good primary stability is achieved, with appropriate occlusal loading, in order to restore chewing function.