Replacement of teeth through implantation and ridge expansion

A case report

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### Introduction

The use of implants with a tapered design and a short drilling sequence is an increasingly common trend, since such implants allow us to perform simple, quick and minimally invasive surgery in the bone. Working with an implant system that has a short drilling sequence also allows us to use a simple and ergonomic surgical tray, which facilitates the work of the surgeon and support staff (Fig. 1).

Moreover, the use of threaded osteotomes is a simple, predictable surgical technique that allows the dentist not only to place implants in areas with a narrow transverse diameter without bone regeneration, but also to improve bone quality in the receiving area and to reduce the drilling sequence in cases of immediate post-extraction implantation.

In the clinical case presented here, transverse bone volume was needed to place two implants in

![Fig. 1. Bego Semados® RS/RSX-Line Trayplus.](image1)

![Fig. 2. Initial situation.](image2)

![Fig. 3. C.B.C.T. scan study of the clinical case.](image3)

![Fig. 4. Tooth 24 after preparation and beginning of the surgical procedure.](image4)
Fig. 5. Digital image made with CEREC Omnicam camera.

Figs. 6–8. Mucoperiosteal full thickness flap with mesial vent for papillary preservation.

Fig. 9. Drill Pilot Marker RS/RSX-Line 1.6.

Fig. 10. Depth drill RS/RSX-Line 2.5 and paralleling post RS/RSX-Line.

Fig. 11. Threaded osteotome.

Fig. 12. Implant bed after preparation.

Fig. 13. BEGO Semados® RSX Implant.

Fig. 14. Insertion of the implants.

Fig. 15. Implants after placement, presenting a colour coded insertion post, optimal parallelism and preservation of the buccal wall.

Fig. 16. Occlusal view of the internal connection of the BEGO Semados® RSX implant.
positions 25 and 26. Instead of guided bone regeneration with an autogenous bone block or xenogeneic bone substitute material covered with a collagen membrane, a crestal expansion with threaded osteotomes was proposed. Also, it was decided to use BEGO Semados RSX implants (BEGO Implant Systems) because of their macroscopic tapered design and high self-tapping property.

_Clinical case_

A 60-year-old non-smoking female patient without any noteworthy clinical pathology or current drug treatment came to our clinic reporting pain and swelling in tooth 27, which was a supporting element of a bridge on teeth 24–27 (Fig. 2). A root fracture with a large apical cyst affecting the three roots of the molar was observed on a CBCT scan (Fig. 3). Based on this finding, the following treatment plan was proposed to the patient:

1) extraction of tooth 27 with cyst removal;
2) bone regeneration of the area using a xenograft particulate bone substitute material (BEGO OSS, BEGO Implant Systems), covered with a resorbable collagen membrane (BEGO Collagen Membrane, BEGO Implant Systems);
3) replacement of teeth 25 and 26 using two implants (BEGO Semados RSX) and bone expansion;
4) seating of a full lithium disilicate ceramic crown (IPS e.max, Ivoclar Vivadent) on tooth 24 fabricated with the CEREC system (Sirona Dental) in the clinic on the same day of the surgery;
5) seating of full lithium disilicate ceramic crowns (also IPS e.max) on the implants placed in regions 25 and 26 three months after the surgery.

After removal of the old fixed prosthesis, and before starting the surgery, tooth 24 was prepared (Fig. 4) and a digital image captured (Fig. 5). Thus, the lithium disilicate ceramic crown could be designed and fabricated with the CEREC system while the implant surgery was performed. Finally, the crown could be cemented at the end of surgery. In order to start the surgery, a full-thickness mucoperiosteal flap with a mesial vent for papilla preservation was raised (Figs. 6–8).

Threaded osteotomes were used after the initial drilling (Figs. 9–11), taking into account the transverse bone loss that existed in the area, as well as the emergence profile of the implant and the future prosthesis. This step had two aims: good 3-D location of the implant and bone condensation, which would improve the bone quality in the receiving area (Fig. 12).

For this clinical case, it was necessary to use an implant that could be easily and atraumatically inserted in order to prevent a greenstick fracture of the buccal cortical wall. Owing to their tapered body design and high self-tapping property, two BEGO Semados RSX implants were selected (Figs. 13–15). This implant was also selected because of