
Mirza Rustum Baig, MDS, MRD1*
Gunaseelan Rajan, FDS, RCS2

This article describes the dental implant-based rehabilitation of a partially edentulous patient with a unilateral maxillary dento-alveolar defect. A screw-retained prosthesis with a modified design was fabricated on zygomatic and regular dental implants. One section of the implant prosthesis has cemented crowns and the other section is conventional screw-retained. The design of the prosthesis overcame the hard and soft tissue deficit and provided the desired esthetics.

INTRODUCTION

Implant-based fixed rehabilitation of partially edentulous maxillae can be achieved by providing a conventional screw-retained or cement-retained implant FPD (fixed partial denture), a hybrid screw-retained or cement-retained implant FPD, and a cement and screw-retained implant FPD.1–5

Screw-retained implant fixed prostheses provide the ease of retrievability, benefit of splinting, and low profile retention. However, the labial or buccal emergence of the access screw channel due to off axial implant positioning in cases of severe ridge resorption compromises esthetics and prevents creation of ideal morphology.1,6 Cement-retained fixed implant prostheses have the advantages of passively fitting frameworks and better esthetics. Custom abutment options can compensate for misaligned implants thus improving esthetics.7–9 However, retrievability, repair and maintenance, choice of cement, and excess cement in the sulcus still remain areas of concern. A combination of a screw-retained prosthesis with cement-retained crowns combines the advantages of both approaches.10

This article presents the rehabilitation of a partially edentulous patient with zygomatic implant using a technique employing simultaneous cement and screw retention in the same prosthesis.

CLINICAL REPORT

A 27-year-old partially edentulous female reported to the clinic seeking a fixed prosthesis. Four teeth (maxillary right lateral
incisor, canine, first premolar, second premolar) had been extracted along with the removal of a large periapical cyst 10 years earlier. An acrylic removable partial denture had been worn since then, as an interim measure. On clinical and radiological examination, there was severe localized resorption of the maxillary alveolar ridge in the region of the extracted teeth (Figure 1). A conventional fixed partial denture was considered, and deemed inappropriate due to the long span of the partially edentulous space and the poor periodontal condition of the anterior abutment tooth. Implant-retained fixed prosthesis was then planned as a better alternative.

The patient was presented options of grafting techniques, but declined them citing time constraints. Hence, a single zygomatic implant was planned in conjunction with 2 root form implants to restore the partially edentulous segment. A decision was taken regarding the prognosis of maxillary right central incisor. Since there was excessive bone loss around this abutment, with gingival recession, it was planned for extraction and immediate implant placement. The left maxillary central incisor was also elected for extraction and immediate implant placement to increase the anterior support for the implant prosthesis and create favorable biomechanics.

Two dental implants (Nobel Biocare Replace Select Tapered TiU 5.0 mm × 16 mm; Nobel Biocare AB, Gothenburg, Sweden) were placed immediate postextraction of the maxillary central incisors along with a single zygoma implant (Branemark Zygoma TiUnite 45 mm; Nobel Biocare AB). An insertion torque of 35 Ncm was achieved for all implants. A 17° zygoma multiunit abutment was torqued to the zygoma implant at 15 Ncm torque. Two straight multiunit abutments were also torqued to similar levels onto the anterior implants. The patient’s old dentures were relined with soft liner (GC Reline soft; GC Corp, Tokyo, Japan), and issued for interim use. Subsequently, open-tray impressions were made of the maxillary arch by using multiunit impression.
copings and master casts were poured with implant replicas (NobRpl; Nobel Biocare AB). Full contour wax pattern was fabricated on multiunit castable copings (Gold coping multiunit; Nobel Biocare AB), cut back done to accommodate the ceramic and then it was cast into a metal (Degudent U; Degudent GmbH, Hanau-Wolfgang, Germany) framework.

The framework try-in was done in the patient to check for passivity of fit. Following this, ceramic veneer (IPS d.SIGN; Ivoclar vivadent, Schann, Leichtenstein) was fired on one part of the screw-retained frame and metal-ceramic splinted crowns were fabricated on the other. Gingiva-colored porcelain was also fired onto the screw-retained infrastructure to replace the soft tissue in deficit areas. Three weeks postimplant placement, the screw-retained framework was secured to the multiunit abutments at 10 Ncm torque (Figure 2). The crowns were cemented over the framework in the central incisor region using provisional (TempBond; Kerr Corp, Romulus, Mich) cement (Figure 3a and b). The patient was then placed on a follow-up protocol. Eight months postdelivery of the prosthesis, the cemented crowns were retrieved and the multiunit abutments were torqued to 35 Ncm (Figures 4 and 5a and b). The screw-retained frame was then secured to the multiunit abutments at 25 Ncm and the screw-access openings filled with gutta percha and sealed with light-cure composite (Filtek Z350; 3M ESPE, St Paul, Minn). The crowns were luted back using provisional cement (TempBond; Kerr Corp) (Figure 6).

**Discussion**

Zygomatic implants have been predictably used in the last few years for the rehabilitation of completely edentulous atrophic maxillae. These implants serve as an excellent treatment alternative to conventional dental implants for restoring severely resorbed posterior maxillae by overcoming the need to perform onlay bone grafting and/or sinus lift procedures associated with conventional placements. However, the zygoma implants have been sparsely used for the rehabilitation of partially edentulous arches. This report describes the rehabilitation of a partially edentulous patient with a single zygoma implant in conjunction with conventional implants. Zygoma implant was considered for this patient as bone grafting was not an option due to patient considerations (delayed protocols) and decision was made against extraction of molar teeth with placement of conventional implants in the posterior region for supporting the prosthesis. The immediate loading protocol adopted in this patient is supported by the success rates recorded for zygomatic implants with immediate loading. However, the reported success rates were applicable for bilateral zygoma implants in conjunction with conventional implants in the premaxillary region.

The technique employed in this article significantly negated the effect of fixture position or angulation on the esthetic outcome of the implant prosthesis. In areas (anterior central incisor region) where the screw-access openings were bound to interfere with the reproduction of desirable esthetics and morphology, the crowns were individually cemented on to the cast framework. The remaining part of implant prosthesis (where the implant fixture position/screw-access openings were ideal) had ceramic veneer material bonded to the cast framework through a conventional technique. The crowns on the cemented part of the prosthesis had only been luted with provisional cement, thereby enabling easy retrievability, repair, and maintenance without jeopardizing the entire framework. Hence, the advantages of both cement and screw retention were extracted in the
prosthesis. The cemented crowns were splinted to increase the retention and offset the relatively shorter height of the abutments. The customized screw-retained metal framework was layered with gingiva-colored porcelain to resemble hard and soft tissue in the maxillary defect zone.  

**SUMMARY**

This report describes the use of cemented crowns in combination with a screw-retained implant prosthesis. A graftless solution for fixed rehabilitation of a partially edentulous patient is presented. The indication for such treatment is specific and dictated by several factors. This method provides an alternative treatment option to conventional techniques.

**ABBREVIATION**

FPD: fixed partial denture

**REFERENCES**