From a prosthetic perspective, it can be challenging to restore dental implants in combination with limited interdental, facial or labial, or interocclusal space. This article describes the translational application of novel-design porcelain veneers and adhesive restorative principles in the implant realm. A patient is presented who was treated with a single implant-supported restoration replacing a missing mandibular lateral incisor and partially collapsed interdental space. A screw-retained custom metal ceramic abutment was combined with a bonded porcelain restoration. This unique design was motivated by the limited restorative space and subgingival implant shoulder. It was also developed as a solution to the interference of the screw-access channel with the incisal edge, therefore providing the surgeon with more options during implant axis selection. The porcelain-to-porcelain adhesive approach was used instead of traditional principles of retention and resistance form of the abutment. (J Prosthet Dent 2008;99:2-7)
vantages similar to those of a cemented restoration, with the absence of a screw-access opening, yet providing optimal esthetics despite a limited restorative space. The technique is not only suitable in the anterior dentition but also for posterior teeth with limited interocclusal space.

**CLINICAL REPORT**

A 24-year-old white man presented with a missing mandibular lateral incisor. The patient history revealed no medical problems. The patient reported that his right mandibular lateral incisor was extruded 2 years earlier subsequent to a car accident. The tooth was extracted following unsuccessful repositioning and the adjacent incisor was endodontically treated because of pulp necrosis. Clinical examination revealed a labial bone concavity and a partially collapsed restorative space (Fig. 1). Tooth replacement with a single implant-supported restoration was selected because the patient rejected any type of fixed partial denture. A conventional crestal incision with 2 remote vertical incisions was used. A tapered implant (Nobel-Replace Tapered Groovy, 3.5 mm × 13 mm; Nobel Biocare AB, Goteborg, Sweden) was placed. The implant presented with a labial dehiscence of 10 mm and was treated after bone perforations with a simultaneous guided bone regeneration procedure using a 2-layer graft technique of autogenous particulate bone and xenograft (Bio-Oss, cancellous 0.25-1 mm; Geistlich Pharma AG, Wolhusen, Switzerland) and a trimmed collagen membrane (Bio-Gide, 25 × 25 mm; Geistlich Pharma AG) (Fig. 2, A and B). The flap was released by a periosteal dissection and closed in a tension-free fashion with an everted crestal flap using monofilament sutures (CV-5 Gore-Tex Suture; W.L. Gore & Associates, Flagstaff, Ariz) (Fig. 2, C). After 6 months of uneventful healing, the implant was uncovered using a mucogingival thickening procedure and a transfer impression (Extrude; Kerr Corp, Orange, Calif) was made (Fig. 3).

A screw-retained provisional restoration (New Outline; MICROSTAR Dental, Lawrenceville, Ga) was first inserted to condition the soft tissues. Once appropriate soft tissue contours were obtained, the definitive restorative phase began, including the fabrication of a screw-retained custom metal ceramic abutment (GoldAdapt Engaging; Nobel Biocare AB) layered with feldspathic porcelain (Creation; Jensen Industries, North Haven, Conn) and a separate type III porcelain veneer, also fabricated with Creation porcelain, using the refractory die technique (Fig. 4). This design was motivated by the limited restorative space, subgingival implant shoulder, and interference of the screw-access channel with the incisal edge. Axial alignment of the implant for a screw-retained restoration was not possible in this situation because the implant body would not have allowed a good labial emergence profile for the restoration. Implant alignment for a screw-retained restoration would have resulted in labial overextension and darker supporting tissue due to the concave labial architecture. It would also have generated more apical dehiscence of the bone during implant placement, requiring in turn a larger bone graft. The restorative technique presented in this article, including the specific axial implant placement and related bone augmentation procedure (Fig. 2), allowed for optimal esthetics of the supporting tissues (Fig. 3) and proper emergence profile of the restoration (Fig. 4). The metal ceramic abutment was customized with Creation porcelain (Jensen Industries) to generate equi- and supragingival margins for the bonded porcelain superstructure. Following careful intraoral evaluation and control of interproximal contacts, the fitting surfaces of the porcelain were prepared for adhesive

Clinical intraoral situation just before transfer impression.

A, Restoration combining screw-retained gold abutment customized with feldspathic porcelain and feldspathic porcelain veneer; note optimal emergence profile of abutment due to proper implant alignment (sagittal view). B, Lingual view.

A, Following surface conditioning, apical portion of abutment was inserted through small hole into rubber dam and carefully placed into implant. B, Adjacent teeth were also engaged through rubber dam to provide optimal access for adhesive placement of veneer, and 35 Ncm torque was applied to abutment screw. C, Radiograph of abutment and implant.
A, Optimal implant placement resulted in labial bone dehiscence. B, Simultaneous resorbable guided bone regen-
eration (GBR) procedure with 2-layer bone graft. C, Occlusal view demonstrates augmented edentulous space after GBR procedure.

Clinical intraoral situation just before transfer impression.

A, Restoration combining screw-retained gold abutment customized with feld-
spathic porcelain and feldspathic porcelain veneer; note optimal emergence profile of abutment due to proper implant alignment (sagittal view). B, Lingual view.

A, Following surface conditioning, apical portion of abutment was inserted through small hole into rubber dam and carefully placed into implant. B, Adjacent teeth were also engaged through rubber dam to provide optimal access for adhesive placement of veneer, and 35 Ncm torque was applied to abutment screw. C, Radiograph of abutment and implant.
rubber dam to avoid any contamination of the fitting surfaces. The abutment was first inserted through a small hole into the rubber dam (Fig. 5, A), then placed intraorally and engaged into the implant for final insertion with 35 Ncm torque applied to the abutment screw (Fig. 5, B). The exact positioning of the abutment was controlled with a radiograph (Fig. 5, C). As is the case with crowns cemented to screw-retained abutments, a soft material (gutta-percha) was used to cover the abutment screw and fill part of the access opening. The previously etched and silanated porcelain surfaces were then coated with adhesive resin, and the veneer was finally inserted with a preheated, light-polymerizing restorative composite resin (Fig. 6). The definitive restoration displays optimal function and esthetics despite the limited interdental space (Fig. 7).

The restoration has been in place for 5 months without complications.

SUMMARY

A new solution is described in which a clinical situation presenting limited restorative space, a subgingival implant shoulder, and interference of the screw-access channel with the incisal edge was approached using a screw-retained custom metal ceramic abutment combined with a bonded porcelain restoration.

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