Congenitally Missing Lateral Incisors: Conservative Techniques

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Anterior Bridge Replacement: Conservative Techniques for Beautiful Esthetics

Common approaches to the replacement of a congenitally missing lateral incisor are an implant-supported crown, a Maryland bridge, a porcelain-fused-to-metal bridge, or a fiber-reinforced composite framework with a porcelain veneer pontic.¹

The advantages of the porcelain veneer bonded to a reinforced composite framework include conservative tooth preparation and high esthetic potential. The ability to match the esthetics of the...
porcelain veneers in the pontic to the veneers in the arch, as well as the fact that the substructure is not opaque as in a metal framework, can make these restorations far more attractive to the eye. Modules of low elasticity in the framework make the bridge more flexible, resulting in less stress to the adhesive interface during function, and making the bridge less likely to debond or fracture.2

**Case Study**

An 18-year-old woman presented postorthodontically with a congenitally missing lateral incisor. The provisional restoration consisted of a Hawley appliance with a denture tooth in the missing space. The patient expressed dissatisfaction with the size, shape, and color of her teeth.3

Examination revealed gingival health with no soft- or hard-tissue pathosis. The patient’s occlusion was solid and there were no discrepancies between centric relation and centric occlusion. Additionally, the full-mouth radiograph examination was inconsequential and no muscle or joint pathosis was observed. Smile analysis revealed a canted smile with the patient’s right lip raising 1½ mm higher than the left (Figure 1). Gingival architecture and zeniths followed the same cant, leaving the zenith of tooth No. 11 far below a line that was parallel to the interpupillary line. The pontic ridge on tooth No. 7 was vertically deficient, compared to the gingival zenith of tooth No. 10. Axial inclinations were also incorrect. The left lateral incisor’s mesial distal width was narrow, and diastemas were present both mesially and distally.

**Diagnosis and Treatment Plan**

The initial treatment plan consisted of a prophylaxis and diagnostic models, centric relation bite, photographic slides, tooth whitening, an implant, and periodontal referral. The patient was dissatisfied with the appearance of her...
smile and desired veneers on the remaining anterior dentition. Because of the difficulty in matching an implant-supported crown to conservative porcelain laminate veneers, implant therapy was rejected. A periodontal treatment plan consisting of ridge augmentation, ovate pontic preparation, and gingival recontouring to create gingival harmony was deemed appropriate. A combination of porcelain laminates with a porcelain laminate bonded to a reinforced composite resin framework to replace tooth No. 10 was the accepted restorative plan.

**Periodontal Surgery**

Ridge augmentation was indicated to increase ridge width in the future pontic site and allow for ideal pontic site development. Gingival recontouring was performed to improve esthetics, providing symmetry and ideal heights of contour.

A connective tissue graft was performed for the soft tissue augmentation of the pontic site at tooth No. 7. Connective tissue was harvested from the palate on the premolar region (Figure 2). Via split-thickness reflection beginning on the crest of the edentulous ridge (Figure 3), the tissue was inserted (Figure 4) to create increased width in the buccal-lingual dimension, and then connected. The flap was closed using a combination of 5-0 and 6-0 chromic gut sutures.

Gingival recontouring in the anterior maxilla was performed simultaneously with augmentation. An internal beveled gingivectomy was performed on the facial aspect of the remaining incisors and canines. Additionally, an external beveled gingivectomy was performed on the palatal aspect of the maxillary central incisors to provide additional tooth length, allowing increased space for the reinforced composite framework connectors.

**Preparation: Surgery PD**

After adequate maturation of the connective tissue graft, which took approximately 3 months, the ovate pontic site could be created via gingivoplasty with a large round diamond in a rotary handpiece. The “denture tooth” on the Hawley appliance was relined to allow tissue maturation of the newly created pontic space (Figure 4A). The pontic space and tooth were again slightly modified before final preparation and impression.

**Preparation**

The patient was anesthetized, and pressed ceramic veneer preparations were performed on teeth Nos. 6 through 11. Lingual framework preparations on teeth Nos. 6 and 8 were performed following manufacturer’s preparation guidelines, to allow connectors of 2 mm x 2 mm. A stump shade was selected for the prepared teeth,
and pictures with several shade tabs were taken to assist the laboratory technician in creating a restoration that would match the existing dentition (Figure 5). A vinyl polysiloxane material was used to take a full arch impression, and an opposing bite registration was obtained with a bite stick, using a thixotropic vinyl polysiloxane bite registration material (Blu-Mousse®, Parkell®) (Figure 6). A provisional restoration was made from the diagnostic wax-up, and Sil-Tec® (Ivoclar Vivadent) was used to fabricate a mold on the model (Figure 7). The preparation was then lubricated with glycerin, and Luxatemp® (Zenith/DMG) in an A-1 shade was injected into the mold and placed on the preparation for 2 minutes. The mold was removed from the prepared teeth and allowed to bench-cure for an additional 3 minutes. It was then seated and trimmed. Final polishing was completed and the provisional was cemented with unfilled resin and bonded on the facial aspect of the anterior teeth (Figure 8). A facebow transfer was recorded, and models of provisional restorations were sent to the laboratory along with all of the photographs taken, and a prescription detailing the patient's central incisor length, width, and color requirements.

**Cementation**

The case was returned from the laboratory and tried on both soft-tissue and die-trimmed models (Figures 9 and 10) to verify accurate marginal fit and overall esthetics. The patient was anesthetized, the provisional restorations removed, and the tissue inspected. The teeth were pumiced and the restorations tried-in. After the patient approved the esthetic appearance of the restoration, a 0E GingiBraid cord was placed interproximally (in retrospect, the author would not opt to pack cord or prepare the tooth subgingivally, unless a dark stumpl was present or hemorrhaging occurred as a result of tissue trauma from subgingival placement of margins or cords), and traditional bonding protocol began by scrubbing the lingual of teeth Nos. 6 and 8 on the preparation, rinsing, acid-etching for 15 seconds, and rinsing again. The preparations were then repolished with an antibacterial solution and blotted dry. A two-step bonding was used and Variolink® (Ivoclar Vivadent) was lightly coated on the entire internal surface of the framework preparation. Light finger pressure was used to stabilize the restoration during clean up and argon laser curing. The two central incisor veneers were cemented in the same fashion (Figure 11). The framework pontic (tooth No. 7) was acid-etched with a sandblaster (Danville Engineering) before the bonding and luting of the lateral incisor veneer (Figure 12).

**Finishing**

Excess cement was removed with scalers and scalpel blades and interproximal margins were finished and polished with finishing strips. The occlusion was evaluated to ensure that proper anterior guidance had been attained. The patient was instructed to return in 1 week for an evaluation of cementation removal, tissue health, and color. Figures 13A,B through 17A,B show the patient before and after treatment.

**Conclusion**

As we enter the 21st century, we have a myriad of options available to us for the replacement of a single missing anterior tooth. The conservative nature of these techniques allows reestablishment of beautiful esthetics and sound functional parameters. The technique performed in this case uses one of the most conservative tooth preparations available today.

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**References**

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