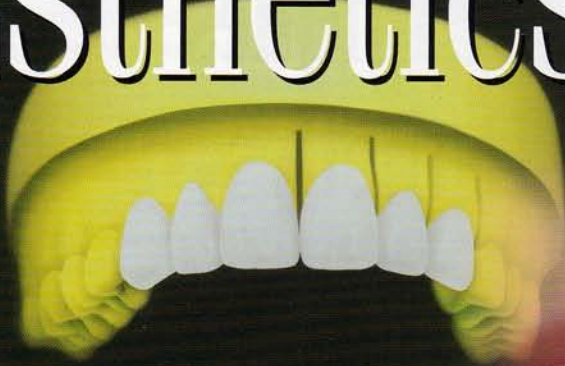


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Congenitally Missing Lateral Incisors: Conservative Techniques

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Anterior Bridge Replacement: Conservative Techniques for Beautiful Esthetics

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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



Figure 1—Preoperative view of patient with canted smile.



Figure 2—Connective tissue harvested from the palate on the premolar.



Figure 3—Split-thickness reflection on the crest of the edentulous ridge.



Figure 4—Harvested tissue is inserted.



Figure 4A—The "denture tooth" on the Hawley appliance is relined to allow tissue maturation of the new pontic space.



Figure 5—Shade tabs are used to communicate the color of the prepared tooth. The underlying color will show through, as the veneers are translucent.

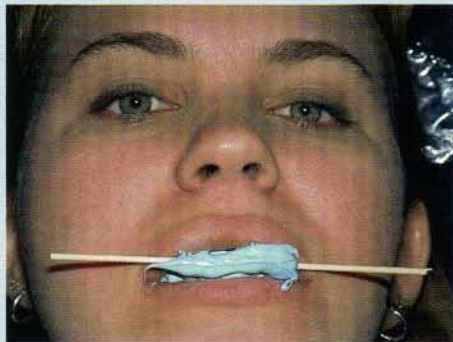


Figure 6—A bite stick embedded in a Blu-Mousse® registration communicates the relationship of the interpupillary line to the occlusal table.



Figure 7—Sil-Tec® impression of the diagnostic wax-up used to hold the Luxatemp® provisional.



Figure 8—After final polishing, the provisional was cemented and bonded on the facial of the anterior teeth.



Figures 9 and 10—Soft-tissue and die-trimmed models were tried-in to verify accurate marginal fit and esthetics.



Figure 11—View after the framework and the two central incisor veneers are cemented.

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



Figure 12—The framework pontic of tooth No. 7 is sandblasted before traditional etching and bonding.

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



Figure 13A—Preoperative 1:1 right lateral view.



Figure 13B—Postoperative 1:1 right lateral view. Note how the pontic over a framework matches the other veneers to create natural-looking esthetics.



Figure 14A—Preoperative 1:1 frontal view.



Figure 14B—Postoperative 1:1 frontal view. Note how gingival architecture and symmetry have been attained.



Figure 15A—Preoperative occlusal view.



Figure 15B—Postoperative occlusal view. Note how the lingual contours and facial periodontal architecture of the bridge mimic the natural anatomy of the contralateral side.

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,⁴ 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.⁵ After the patient approved the esthetic appearance of the restoration, a 0E GingiBraid cord was placed intersulcularly (in retrospect, the author would not opt to pack cord or prepare the tooth subgingivally, unless a dark stump 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 redampened 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



Figure 16A—Preoperative 1:2 view of smile.

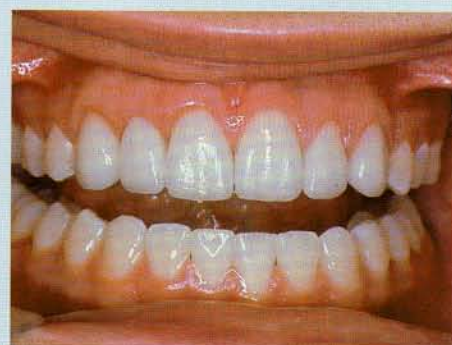


Figure 16B—Postoperative 1:2 view of smile. Note ideal proportions.



Figure 17A—Preoperative view; full face.



Figure 17B—Postoperative view; full face.

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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Product References

Product: Blu-Mousse®
Manufacturer: Parkell®
Address: 155 Schmitt Blvd.
Box 376,
Farmingdale, NY 11735
Phone: 800/243-7446
Fax: 631/249-1242

Product: Sil-Tec®, Variolink
Manufacturer: Ivoclar Vivadent
Address: 175 Pineview Drive,
Amherst, NY 14228
Phone: 800/533-6825
Fax: 716/691-2285

Product: Luxatemp®
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Address: 242 S. Dean St.,
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Phone: 800/662-6383
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Product: Sandblaster
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Address: 1901 San Ramon Valley
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