The Creation of Soft Tissue Emergence Profile With a Long Term Ribbond THM Provisional: Case Report

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There is an ever-increasing body of dental research literature evaluating the use of fibers to reinforce the clinical performance of dental composites and acrylics. Teeth restored with fiber posts show a significantly higher resistance to fracture than titanium[1] and stainless steel posts.[2] Teeth restored with fiber posts are significantly stronger in static and fatigue fracture testing than teeth restored with metallic posts,[3] resulting from an elastic modulus that more closely approaches dentin, producing less concentrated stress on the root.[4] Similarly, custom fiber-reinforced posts (Ribbond-Ribbond, Seattle WA) fabricated directly into the root canal space with composite show that polyethylene fiber-reinforced posts with composite cores show high survival rates and can be recommended for use.[5,6] As well, the insertion of Ribbond inside the cavity has a positive effect on fracture strength of endodontically treated molar teeth with MOD cavity preparation and cuspal fracture[7] and has the ability to reinforce severely compromised teeth which have been endodontically treated.[8]

The use of fiber reinforcement has distinct advantages in traditional composite restorative techniques. The use of fiber under composite restorations can save the tooth structure by changing fracture lines if cusp failure should occur[9] and significantly increases fracture strength of MOD composite restorations, especially if placed in a buccal to lingual direction.[10] The fatigue strengths of particulate filler composite resins is 49-57 MPa, and those of fiber reinforced composites is 90-209 MPa with the strain of UHMWPE (Ribbond) being the highest.[11] Strain energy absorption can be increased 433% over unreinforced composite, with the leno-weave reinforced composite having the highest consistency due to the details of its architecture which restricts fabric shearing and movement during placement[12] Polyethylene reinforcing fiber when used in combination with a flowable resin in high C factor cavity preparations, results in stable bond strengths and an increase in the microtensile bond strength to the dentin floor.[13] Another significant advantage of using fiber reinforcement in traditional Class II composite resins is

FIGURE 1—Initial presentation of patient with (fractured/resorbing) 11 and 21.

FIGURE 2—

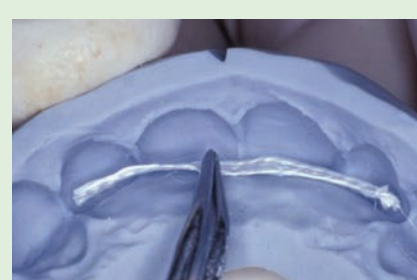

FIGURE 3—Evaluation of the length of Ribbond THM required to adapt from lateral to lateral incisor. Ribbond Triaxial is used for larger cases.

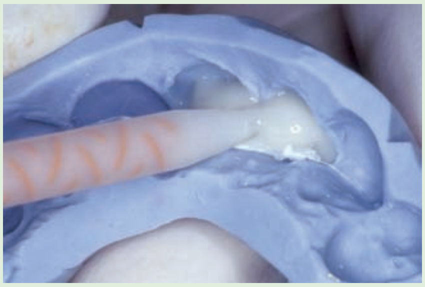

FIGURE 4—Placement of Temptation over the wetted Ribbond THM.

FIGURE 5—Injection of the Temptation into the extraction sockets.

FIGURE 6—Seating of the temporary matrix.

FIGURE 7—Temporary removed from the matrix and flowable added to create initial convex pontic form.

FIGURE 8—Trimming the pontic tissue surface to create a conically shaped pontic profile which will be 3mm below the tissue margin.

FIGURE 9—Marking the level of the free margin to allow for accurate length measurement of the apical projection.

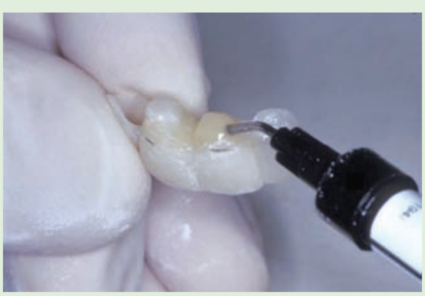

FIGURE 10—Addition and modification of the tissue adaptive surface with flowable resin.

FIGURE 11—Application of Tempglaze to the shaped temporary bridge which was cured with a broad band curing light for 30 seconds per unit.

FIGURE 12—Cementation with Cling 2 and excess cement removed.

the significant decrease in gingival microleakage.[14]

Strassler has written extensively on the benefits of fiber reinforcing material with dental resins and has used fiber reinforcing in single tooth replacement techniques,[15] single visit natural tooth pontic bridges,[16] and periodontal splinting with thin-high-modulus polyethylene ribbon.[17] The high molecular weight polyethylene has a high wear resistance and high impact strength,[18] with its plasma treatment resulting in chemical integration with composite resins.[19] With a locked-stitched leno-weave, the fibers maintain their orientation when adapted to the tooth structure or integrated into temporization and do not unravel when cut.[20] The addition of fibers to provisional resins increases the fracture toughness and flexural strength[21] with the clinical implication of a reduced incidence of fixed provisional restoration failure[22] due to enhanced fracture resistance.[23] Additional strengthening of the connector areas can be achieved through the use of a fiber reinforcing material such as Ribbond THM (Ribbond Inc. Seattle USA) (Clinical Research Dental).[24] Polyethylene fiber reinforced composite bridges can be considered as a permanent treatment due to their strength[25,26] with selection of appropriate fiber reinforcement and placement of the fibers allowing long term clinical success.[27]

CASE PRESENTATION

A 55-year-old patient presented to the practice with two failing upper centrals (Fig. 1). Tooth #11 had a vertical fracture and tooth #21 had a failing root canal treatment. Upon presentation of the various options to restore the area, the patient opted for placement of a four unit fixed bridge. The centrals were

FIGURE 13—Tissue profile after removal of the temporary bridge which was in place for 10 weeks.

FIGURE 14—Six unit anterior case showing tissue profile after removing the temporary bridge.

FIGURE 15—Same case final restoration immediately post cementation.

FIGURE 16—Tissue profile after removing temporary bridge.

FIGURE 17—Fixed restoration showing excellent tissue profile.

FIGURE 18—Tissue contours after removal of temporization.

FIGURE 19—Final fixed restoration.

atraumatically extracted with minimal trauma to the soft tissues and alveolar process (Fig. 2). The lateral incisors were minimally prepared for the initial long term temporization so that the gingival tissues would have an opportunity to stabilize. Utilizing a previously fabricated polyvinyl siloxane matrix, an appropriate length of Ribbond THM (thinner higher modulus) was cut to extend from lateral to lateral incisor (Fig. 3). The Ribbond THM was wetted using unfilled bonding adhesive, the excess blotted off with a lint free gauze, and the saturated Ribbond was placed onto the lingual surface of the PVS matrix followed by injection of Temptation (Clinical Research Dental) (Fig. 4). A small amount of Temptation was placed into the extraction sockets (Fig. 5) and the PVS matrix was seated intra-orally (Fig. 6). After polymerization was complete, the matrix was removed, and the temporary bridge was removed from the matrix (Fig. 7). To create the desired soft tissue emergence profile (ovate pontic form) for the final restoration, the temporary bridge was fabricated to extend 3mm below the free margin of the gingival tissue. The over-extension was removed (Fig. 8) and both pontics shaped and contoured to measure exactly 3mm from the marked position of the free margin with flowable composite (Figs. 9 & 10). Initial shaping of the temporary bridge was followed by the application of Tempglaze (Clinical Research Dental) which was cured with a broad spectrum curing light for 30 seconds per unit (Fig. 11). The temporary was cemented with Cling 2 (Clinical Research Dental) and all temporary cement removed (Fig. 12). After 10 weeks the soft tissue shows excellent tissue contours which will allow for natural looking emergence profile for the 11 and 21 pontics (Fig. 13).

Three additional clinical cases are presented in photo format only, to show the type of tissue response that can be created with this technique (Figs. 14-19). **OH**

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Oral Health welcomes this original article.

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