CASE REPORT

PAPILLA RECONSTRUCTION USING THE DENTAL OPERATING MICROSCOPE

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This article presents a case report of papilla reconstruction in a patient with severe periodontal disease. Papilla reconstruction is a difficult procedure when performed with the naked eye; however, it becomes much easier when carried out using the dental operating microscope. The technique presented here—the so-called patch technique—is composed of the following operations under the dental microscope: (1) debridement, desquamation, and tension-releasing incisions through the sulcus; (2) harvest of connective tissue from the palate; (3) support of an epithelial flap with the harvested connective tissue patch; and (4) lifting of this combined flap in the coronal direction using a composite resin anchor on the tooth surface. The patch technique is an effective method for papilla reconstruction when used in conjunction with the operating microscope. Int J Microdent 2009;1:25–29

The idea of supporting an epithelial flap with harvested connective tissue comes from an old tailoring technique. During the papilla reconstruction, excessive strength is needed to pull a flap coronally. Therefore, lifted flaps often result in tears or necrosis. In tailoring, valuable and delicate cloths are usually supported from the back with another cloth to prevent damage.

The patch technique (Fig 1) involves the following procedures performed under magnification:

1. Incision and debridement through the sulcus.
2. Desquamation of an epithelial flap through the sulcus such as in the envelope technique.
3. Placement of tension-releasing incisions through the sulcus.
4. Enamel matrix derivative treatment on the root surface.
5. Harvest of connective tissue from the palate.
6. Support of the epithelial flap with the harvested connective tissue patch.
7. Placement of β-tricalcium phosphate (β-TCP) underneath the connective tissue.
8. Creation of an anchor for the sutures and the flap on the tooth surface using flowable composite resin.
9. Suturing and lifting of the combined flap in the coronal direction using the anchor.

Fig 1 Preoperative (left) and postoperative (right) schematic illustrations of the patch technique.
The patient was a 39-year-old Japanese woman with no systemic disease who presented with severe periodontitis and bone loss on the mesial aspect of the maxillary right first premolar (Figs 2 to 4). To reduce damage to the tissue, incisions were made through the sulcus and debridement was carried out (Fig 5).

Use of an operating microscope reduces the chance of residual infected areas compared to conventional, unaided debridement. After debridement, tension-releasing incisions were made through the sulcus (Fig 6). At this time, the mobility of the reflected flap should be checked to ensure it can reach the optimal coronal position (Fig 7). An anchor was made on the coronal one-third of the tooth surface using flowable composite resin (Fig 8). The required size (width and length) of connective tissue was measured with a perioprobe (Fig 9). Connective tissue was harvested from the palate (Figs 10 and 11). Enamel...
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matrix derivative (Emdogain, Straumann) was placed on the exposed and cleaned root surfaces (Fig 12). Sutures were then placed and the flap was raised using the composite resin anchor (Fig 13). The connective tissue patch was used to support the flap (Fig 14). β-TCP was placed apically between the maxillary right canine and first premolar (Fig 15). The area where β-TCP was inserted was closed with 8-0 suture. To prevent the suture from coming off of the anchor, the suture was cured with flowable composite resin and polished (Fig 16). Figures 17 and 18 show the treated site 7 days and 40 days after surgery, respectively.

The interproximal area between the canine and first premolar was filled with the flap. Unfortunately, β-TCP had leaked out, but it was easily removed. Better methods to prevent leakage of β-TCP have been introduced since this patient was treated.
The canine and first premolar did not contact each other at this time, and it was planned to place a porcelain laminate veneer on the canine (Figs 19 and 20). Radiographs taken at baseline, at 15 months, and at 22 months showed the presence of hard tissue regeneration between the treated teeth (Figs 21 to 23). Two years after treatment, the pocket depth was 2 mm on the mesial aspect of the first premolar, and the reconstructed papilla and periodontitis were well controlled (Figs 24 and 25).
DISCUSSION AND CONCLUSION

The most difficult aspect of the patch technique is the debridement through the sulcus. Infected roots should be cleaned, and all granulated tissue should be removed from the sulcus without damaging any surrounding soft tissue. Debridement under the operating microscope is more effective in this regard than unaided debridement.

The concept of inserting harvested connective tissue into the sulcus may seem similar to the concept of supporting an epithelial flap with harvested connective tissue; however, they should not be considered interchangeable, since more research is needed to identify the advantages and disadvantages of both concepts.

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