

Orthodontic Distalization for Pre-Prosthetic Rehabilitation

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An adult patient with missing teeth often presents with a reduced vertical dimension, a skeletal malocclusion, and some degree of temporomandibular disorder (TMD). Effective treatment of such a complex case often requires the collaboration of multiple dental specialists. In recent years, we have found that orthodontic tooth movement can facilitate prosthetic restoration.

In a case with a missing posterior tooth, the adjacent tooth can be moved distally into the edentulous area. An implant placement site with optimal vertical and buccolingual dimensions is thus created, taking advantage of the presence of a residual alveolar ridge and the absence of masticatory function, which would otherwise lead to resorption.¹ The healthy periodontal support around the distalized tooth ensures physiological regeneration of the alveolar process.

Research into the bone's reaction to dental movement through edentulous areas and at different levels of bone loss has demonstrated that periodontal health can be maintained given good oral hygiene, with no clinically significant damage to the supporting tissue.²⁻⁴ The depth of alveolar bone and the attachment of connective tissue around the tooth remain stable. Therefore, bodily movement of a tooth along with its healthy periodontal support into an edentulous area allows the regeneration of lost alveolar bone. Even compromised teeth can be used for this purpose.

Controlled orthodontic extrusion has been used effectively to raise the gingival margin and the level of the alveolar crest prior to an extraction.⁵ The stress on the periodontal fiber during tooth movement is transferred to the alveolar bone, stimulating bone deposition at the height of the crest.⁶ Extrusion also increases the volume of periodontal tissue in the area, as the gingival margin moves upward while the mucogingival junction remains stable.⁷

The present article describes the use of ortho-

odontic distalization prior to implant placement in two cases requiring orthodontic correction as well as prosthetic restoration.

Procedure

Before orthodontic treatment, each patient received periodontal therapy. Initial alignment was carried out with .022" \times .028" edgewise appliances on light archwires. As soon as a rectangular archwire could be inserted, distal movement of the adjacent premolar into the edentulous region was begun. A 200g nickel titanium spring was compressed between the two premolars on an .019" \times .025" stainless steel archwire to create the necessary sliding mechanics, using light, continuous forces. The premolars were also bonded lingually, and a lingual sectional arch and nickel titanium spring were placed to avoid rotations and reduce tipping of the distalized tooth.

Serial panoramic and buccal radiographs were obtained during treatment to monitor the marginal bone levels and check for possible root

TABLE 1
CASE 1 CEPHALOMETRIC DATA

	Norm	Pre-treatment	Post-treatment
SNA	82°	80°	81°
SNB	80°	75°	78°
ANB	2°	5°	3°
FMA	25°	25°	22°
FMIA	67°	63°	73°
IMPA	88°	92°	85°
Occlusal plane	10-14°	4°	6°
Z-angle	75-78°	68°	73°
1-PFH	125°	100°	105°
Interincisal angle	135°	144°	148°