

AAP-Commissioned Review

Temporary Anchorage Devices for Tooth Movement: A Review and Case Reports

Michael K. McGuire,*† E. Todd Scheyer,*† and Ronald L. Gallerano*§

Background: Temporary anchorage devices (TADs) are immediately loaded miniscrews and osseointegrated palatal implants that are placed to control tooth movement during orthodontic treatment and removed when the treatment is completed. They are a relatively new addition to the dental armamentarium and can be used in some cases to replace traditional orthodontic extraoral appliances. Because placement requires a surgical procedure, orthodontists often refer patients to periodontists for this stage of the overall treatment plan.

Methods: The purpose of this article is to introduce TADs to the periodontal community by reviewing their purpose, various systems that are available, indications for use, site selection, and surgical technique. Case reports are included to illustrate this new treatment approach.

Results: Placement of osseointegrated implants for restorative purposes is an established procedure in most periodontal offices. Although placement of TADs is a modification of these familiar techniques, most of these devices serve a very different purpose, involving new loading protocols with no expectation of osseointegration in patients usually not receiving concomitant periodontal therapy.

Conclusions: Periodontists' knowledge of soft and hard tissue anatomy and their ability to manage soft tissue position them well to collaborate with orthodontists in this multidisciplinary treatment. However, as with every new modality, clinicians need to understand the specific uses and limitations of TADs and work closely with their referring orthodontists in identifying patients for whom miniscrew implants are a viable option. Periodontal practices are based primarily on referrals from dental colleagues, and the concept of periodontists working cooperatively with orthodontists is not new. Including TAD placement among the services periodontists offer provides another opportunity to further this relationship and to establish periodontists as appropriate resources for this segment of orthodontic treatment. *J Periodontol* 2006;77:1613-1624.

KEY WORDS

Dental implants; orthodontics; tooth movement.

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Orthodontic anchorage is simply defined as the ability to limit the movement of some teeth while achieving the desired movement of other teeth. However, orthodontists have been searching for the most appropriate methods and appliances to achieve this goal since the 18th century.¹ The age-old problem in orthodontics is essentially the application of Newton's third law of motion: for every action, there is an equal and opposite reaction. When treatment planning, orthodontists must determine what those equal and opposite reactions will be. When attempting any desired tooth movements, orthodontists also must consider reciprocal effects on the final molar and canine relation, overjet, overbite, stability, the periodontium, and esthetics. Assuming ideal treatment goals, anchorage requirements need to be evaluated in three planes of space: anterior-posterior (AP), transverse, and vertical. Until recently, orthodontists relied on intra- and/or

* Private practice, Houston, TX.

† Department of Periodontics, University of Texas Dental Branch, Houston, TX.

‡ Department of Periodontics, University of Texas Health Science Center, San Antonio, TX.

§ Department of Orthodontics, University of Texas Dental Branch.