

Anchorage reinforcement with a fixed functional appliance during protraction of the mandibular second molars into the first molar extraction sites

Aditya Chhibber^a and Madhur Upadhyay^b

New York, NY, and Farmington, Conn

Protraction of posterior teeth into edentulous spaces is a challenge. This report describes the treatment of a 19-year-old woman with missing mandibular first molars owing to caries. A fixed functional appliance was used for anchorage reinforcement during mandibular second molar protraction. Eight millimeters of bilateral protraction was done with bodily mesial movement of the molars and no lingual tipping of the incisors. (*Am J Orthod Dentofacial Orthop* 2015;148:165-73)

Effective space management of missing posterior teeth is a great challenge in orthodontic treatment. Edentulous posterior sites are commonly seen in an adult population. The most commonly observed missing teeth are first molars, often owing to caries,¹ and second premolars, which are the most common congenitally missing teeth.² The sequel of missing mandibular first molars is usually tipping and drifting of adjacent teeth, supraeruption of unopposed teeth, poor interproximal contacts, poor gingival contours, reduced interradicular bone, and pseudopockets.³

Treatment options for missing posterior teeth commonly include fixed prosthodontic bridges or endosseous implants. Although both are viable treatment options, the use of fixed partial dentures may compromise the longevity of adjacent prepared teeth with the risk of secondary caries and mechanical failures,⁴ whereas endosseous implants can increase the financial burden for patients.⁵ Orthodontic space closure of edentulous sites is an alternative treatment option. However, attempts at space closure by protraction of posterior teeth into the edentulous sites without anchorage reinforcement bears the risk of anchorage loss, thereby leading to a compromised occlusion.

Historically, extraoral appliances such as chin cup and facemask have been used for protraction of posterior teeth.⁶ However, use of extraoral devices depends on patient compliance, and it has been reported that patient compliance is generally overestimated when similar devices are used for orthopedic purposes.⁷ Hemisection of deciduous teeth has also been advocated to encourage more mesial eruption of the permanent teeth into the missing-tooth regions.⁸ Recently, there have been case reports in the literature on the use of mini-implants for protraction of mandibular posterior teeth into edentulous sites.⁹⁻¹² However, mini-implants placed in interradicular regions can cause root damage because of improper placement of the devices,^{13,14} which can subsequently lead to implant failure.^{15,16}

Thus, development of alternative methods capable of providing absolute anchorage while protracting posterior teeth into edentulous sites is desirable. Fixed functional appliances have traditionally been used for Class II correction. The use of such appliances results in a combination of mild skeletal effects along with dentoalveolar changes such as retroclination of the maxillary incisors and proclination of the mandibular incisors, and distalization of the maxillary molars and mesial movement of the mandibular molars.^{17,18} The aim of this report was to use a fixed functional appliance for anchorage reinforcement during space closure by protraction of the posterior teeth into the edentulous spaces without Class II correction.

DIAGNOSIS AND ETIOLOGY

A 19-year-old woman came to the orthodontic department at University of Connecticut Health Center

^aAssistant professor, Division of Orthodontics, College of Dental Medicine, Columbia University, New York, NY.

^bAssistant professor, Division of Orthodontics, Department of Craniofacial Sciences, University of Connecticut Health Center, Farmington, Conn.

All authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest, and none were reported.

Address correspondence to: Aditya Chhibber, College of Dental Medicine, Columbia University, 630 West 168th Street, New York, NY 10032; e-mail, adityachhibber14@gmail.com.

Submitted, October 2014; revised and accepted, February 2015.

0889-5406/\$36.00

Copyright © 2015 by the American Association of Orthodontists.

<http://dx.doi.org/10.1016/j.ajodo.2015.02.029>



Fig 1. Pretreatment photographs.

Table. Cephalometric skeletal analysis before and after treatment

	<i>Pretreatment</i>	<i>Posttreatment</i>
SNA (°)	77	77
SNB (°)	71	71
ANB (°)	6	6
SN-GoGn (°)	47	48
FMA (°)	41	42
U1-SN (°)	118	92
U1-NA (°)	42	19
U1-NA (mm)	12	3
IMPA (°)	90	92
L1-NB (°)	35	33
U1-NB (mm)	13	11
E-line-upper lip (mm)	1	-5
E-line-lower lip (mm)	5	-2

with a chief complaint of “crooked teeth.” Her previous medical history was not significant, and no history of habits was reported. Her dental history showed that the mandibular left and right first molars were extracted because of caries approximately 4 years

previously. She had a Class II malocclusion on an underlying Class II skeletal base with a normal sized maxilla, a short mandible, and a vertical growth pattern (Fig 1, Table). Dentally, the patient had proclined and forwardly placed maxillary incisors and normally inclined and forwardly placed mandibular incisors with U-shaped maxillary and mandibular dental arches, missing mandibular right and left first molars with 8 mm of extraction space bilaterally, mesially tipped mandibular second molars bilaterally (Fig 2), extruded maxillary left and right first molars, an end-on canine relationship, moderate crowding in both arches, an increased overjet, a 4-mm overbite, and a 3-mm curve of Spee in the mandibular arch. Facially, the patient had a leptoprosopic facial type with a convex soft tissue profile, a right angled nasolabial angle, and 100% maxillary incisor and 70% mandibular incisor display on smiling. The mandibular midline was coincident with the facial midline, and the maxillary midline was shifted 2 mm to the left, along with incompetent lips (Fig 2) and lip strain on closure.

Download English Version:

<https://daneshyari.com/en/article/3115346>

Download Persian Version:

<https://daneshyari.com/article/3115346>

[Daneshyari.com](https://daneshyari.com)