

Restorative – Orthodontics: A substitution for missing teeth

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Abstract:

Most often the missing teeth are conventionally managed with either implants or other fixed or removable prostheses. This article describes another possibility of orthodontically closing these spaces, thereby restoring an ideal occlusion and arch integrity without the need of prosthesis. This article presents case reports where the spaces of missing teeth were closed orthodontically, leaving no room for prosthesis, thereby providing a physiologically balanced occlusion and avoiding the lifelong maintenance of prosthesis.

Keywords: Molar Protraction, space closure

Introduction

A missing tooth in a dental office is always a potential case for a bridge or an implant. The treatment is predictable and the treatment time is shorter. But, there is a possibility in orthodontics that can be explored in some cases, where the edentulous spaces are closed to give a physiologically balanced occlusion, thus avoiding the lifelong maintenance of prosthesis. Many orthodontic patients have posterior spacing due to missing mandibular teeth. Excluding the third molars, the mandibular second premolar is the most common congenitally absent tooth.¹ The mandibular first molar is the most frequently lost tooth in adults.²

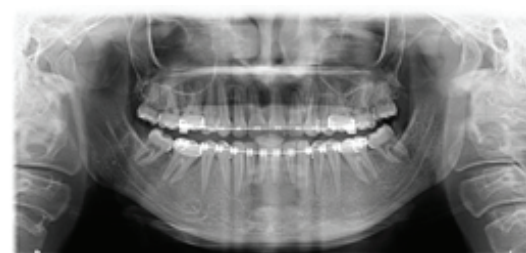
Molar protraction can be an alternative to restoration with posterior dental implants or fixed partial dentures. Case reports are presented in this article, in which the posterior edentulous space was closed by molar protraction (mesial movement of the molar into the edentulous space) in one case. In another case the missing lower central incisor space was closed by orthodontic means.

Case Reports

Case 1



Before



After

Case 2



Before

After

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Case 3

Before



After



Pre operative Orthopantamograph

Case 4

Before



After



Before



After

Discussion

The protraction of the mandibular molars is challenging because of the high density of mandibular bone. Anterior dental anchorage is often inadequate to protract even a single first molar without the reciprocal retraction of the incisors or the movement of the dental midline. Furthermore, if the buccal and lingual cortical plates in the edentulous region have collapsed, a safe and effective protraction may be impossible. Avoiding anchorage loss is considerably more challenging in the mandible than in the maxilla, in part because of the structural differences between the two jaws. The posterior maxilla is composed of uniformly thin cortices which are interconnected by a network of spacious trabeculae,^[3] while the posterior mandible consists of a thicker cortical bone with dense,

radially oriented trabeculae.⁴ In the molar region, the maxilla has an average buccal cortical thickness of 1.5mm, as compared to the 2mm thickness in the mandible.^{4,5} The rate of molar protraction is inversely related to the radiographical density or the cortical thickness of the resisting alveolar bone.⁶ Because of the increased thickness of the mandibular cortical bone, the rate of mandibular molar translation with skeletal anchorage is nearly half that of the maxillary molar translation, which is approximately 0.34 - 0.60mm per month.⁷ Many adult orthodontic patients with posterior edentulous spacing will have missing teeth for years and therefore exhibit alveolar ridge resorption. The rate of resorption is greatest during the first several months to two years after extraction, but it decreases thereafter.^[8]

The amount of post-extraction resorption is significantly greater on the buccal than on the lingual side in both the arches.⁹ During the first year after tooth extraction, the amount of resorption in the mandible is twice of that in the maxilla—a ratio that increases to 4:1 after seven years.¹⁰ The potential risks of molar protraction through an atrophic ridge include the loss of attachment (particularly in the presence of plaque), dehiscence, mobility, ankylosis, root resorption, devitalization, and tooth morbidity. Although a successful molar protraction through the atrophic ridges has been reported, no clinical study to date, has evaluated the correlation between an atrophic ridge and periodontal response during bodily tooth movement. Hence, the decision on whether to proceed with orthodontic tooth movement through an atrophic ridge must be made on a case-to-case basis.

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