

Mandibular Molars Uprighting Using Retromolar Temporary Anchorage Devices

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Abstract: One of the most common complication of molar extraction is mesial tipping of second molar, which complicate the ability of prosthetic rehabilitation. A large variety of techniques can be used for second molar uprighting. Among of these methods is a direct use of Temporary Anchorage Devices (TADs) which has the advantages of their ability to move specific teeth or even the entire quadrants directly, without involving other teeth or using inter-arch mechanics. This case report demonstrates successfully the use of Temporary Anchorage Devices (TADs) for mandibular second molars uprighting.

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1. Introduction

After extraction or loss of a first molar, multiple complications may occur. The second molar tip and drift mesially which cause traumatic occlusion, functionally disturbing interferences, paralleling dilemmas associated with prosthetic rehabilitation, space problems in conjunction with implant insertion, and periodontal problems¹.

In this situation, a pre-prosthetic orthodontic uprighting of tipped second molar required. Many techniques can be used to achieve the required objectives. These techniques include, Conventional methods for molar uprighting such as such as Australian uprighting spring, cantilever spring, prefabricated Sander spring, helical uprighting spring, NiTi coil spring, push spring appliance, and traction from removable appliances are few of the currently available options^{2,3,4}. These methods have some disadvantages, including extrusion of the target molar, unwanted reciprocal movement of the anchorage units, need for bulky appliances, and longer treatment time⁵.

Orthodontic temporary anchorage devices (TADs) for molar uprighting. The mechanics used can be direct or indirect anchorage. TADs advantage is their ability to move specific teeth or even the entire quadrants directly, without involving other teeth or using inter-arch mechanics⁶.

Melsen et al mentioned that the differential diagnosis is important before selecting the optimal force system and appliance design⁷.

The purpose of this case report is to discuss and mention the use of Temporary Anchorage Devices for molars uprighting.

2. Case Report

A 22-year female patient referred from prosthodontics department, Eastern Riyadh Specialized Dental Center, KSA. The referral requested to upright the lower right and left second molar to facilitate implant replacement of first molars.

The patient is medically fit and internally as well as externally motivated for the orthodontic treatment. Intraorally the patient present with class II ¼ unit in right canine, class I left canine relationship, Class I buccal segment bilaterally, missing lower first molars and upper midline shifted 1 mm to the left (Figure 1).

The treatment options include:

1. comprehensive upper and lower fixed orthodontic appliance and space closure of extraction space.

2. Adjunctive orthodontic treatment including extraction of lower third molars and uprighting the second molars using miniscrew as a direct anchorage in retromolar area.

The patient was in a hurry to finish treatment as fast as possible. The second option was chosen after obtaining a signed treatment consent from the patient.

After using a 0.12% Chlorhexidine mouth wash for 60 seconds, 1.8 mm diameter and 13 mm length miniscrew (3m Unitek) inserted in mandibular retromolar area using miniscrew driver (Figure 2).

A power chain from engaging the mandibular second molars bands from lingual and buccal sides (Figure 3). Activation done by changing the elastic power chain every 4 week and total treatment time of 3 months.

After obtaining the required space, bonded fixed 19x25 SS retainers between the premolars and molars to maintain the achieved result until implant placement (Figure 4).



Figure 1. Pretreatment Intraoral photographs



Figure 2. Miniscrew and Miniscrew Driver



Figure 3. A power chain from engaging the mandibular second molars bands from lingual and buccal sides



Figure 4. Posttreatment Intraoral photographs

3. Discussions

Second molar tipping is common consequence of loss of first molar. This complicate the ability to restore the tooth with implant or other prosthetic therapy.

The choice of mechanics to be used in molar uprighting depends on many parameters, including the anatomical characteristics of the area and the facial pattern of the patient (8).

Adjunctive Orthodontics is a tooth movement carried out to facilitate other dental procedures that are aimed at controlling disease and restoring function (9).

To upright the tipped second molar, many orthodontic techniques had been used. A common point is that mandibular molar uprighting is a frequent and complicated procedure, which requires good anchorage control (10).

Temporary Anchorage Devices has surely been an important tool in orthodontics. These treatments require minimum patient compliance and a good oral hygiene can be more easily maintained. Even in patients who do not need prosthetic rehabilitation, recent studies have used the retromolar, palatal and alveolar regions for the placement of implants only for orthodontic purposes, for induced movement of teeth or segments (11).

TADs easy to insert and remove, may be used immediately, are less costly and may be placed in several sites, increasing their versatility.

4. Conclusion

This case described how the use of the Temporary Anchorage Devices in retromolar area for uprighting second molars. A satisfactory control of the tooth movement was achieved avoiding unwanted reactionary forces on the dentation.

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