

Impacted Mandibular Third Molar Uprighting- A Case Report

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Abstract: Impaction of the mandibular 3rd molar is one of the most commonly seen dental aberration. A severe mesioangular impacted mandibular third molar is usually extracted to avoid potential damage to distal root of the second molar or food impaction leading to caries in second and third molar. In cases with early loss of permanent mandibular 1st molar there is usually a mesial tipping of the adjacent 2nd molar and loss of space for an ideal prosthesis. In such cases if a mesioangular impacted third molar is present then an ideal treatment would be the orthodontic uprighting of the impacted third molar and closure of the first molar space by mesialising the second and the uprighted third molar. One of the effective appliances for molaruprighting is the tip-back cantilever technique. This article presents uprighting of severely mesioangular impacted 3rd molar using modified Begg's uprighting spring.

Keywords: 3rd molar impaction, molar uprighting, Modified Begg's uprighting spring

I. Introduction

Mead¹ defined an impacted tooth as "one that is prevented from erupting into position due to malposition, lack of space or other impediment". Dachi and Howell² reported in survey of 3874 routine full mouth roentgenographs among Oregon students that 21.9% of mandibular 3rd molar were impacted, 17.5% maxillary 3rd molar impacted and frequency of impactions was more in females than males². Most common cause for impaction of the third molar is the lack of space between 2nd molar and ascending ramus. Other causes include fault in growth of mandibular length, direction of growth at condyle or pattern of eruption of teeth. Apart from these well-known aetiologies, probable iatrogenic factors of 3rd molar impaction are incorrectly fitted bands cemented onto the 2nd molars, prevention of mesial drift of the first molar caused by a lip bumper or lingual arch therapy, and excessive tip-back of the first molar during previous orthodontic treatment.

Extraction of 1st molar or 2nd molar due to caries or any other reason will cause mesial tipping of the 3rd molar in extraction space over a period of time. Placement of prosthesis in such a scenario is difficult and it is prone to failure as masticatory force distribution is improper, also prosthetic replacement of missing tooth either by bridge or implant is expensive and unaffordable in many situations. So it becomes necessary to upright the 3rd molar and get it in the arch to avoid unnecessary prosthetic replacement. It would be thus appropriate to try and upright a healthy even though impacted mandibular 3rd molar. While it is recognized that any of the uprighting techniques can be applied in a given situation, the technique should be determined by factors such as the severity of the molar impaction, the accessibility of the coronal surface of the impacted tooth, the desired type of movement, the undesirable side effects, as well as the simplicity and the convenience of the uprighting mechanics.³⁻⁵

This paper presents a case in which a severely mesioangularly impacted right mandibular third molar was uprighted using a modified Begg's uprighting spring.

II. Case report

A 20 year old boy came to the Department of Orthodontics and Dentofacial Orthopaedics, Govt. Dental College and Hospital, Ahmedabad with the chief complaint of unevenly placed teeth. The patient had a history of extraction of both mandibular 1st permanent molars due to gross decay at the age of 12 years.

On extra oral examination patient had normal gait and posture, mesoprosopic facial type, straight soft tissue profile, competent lips, non-consonant smile arc and no facial asymmetry was observed, Intraoral examination showed ectopically erupted maxillary canines (buccal), carious upper right 1st molar and carious and restored upper left 1st and 2nd molar. The upper left lateral incisor was in cross bite (fig. 1). The patient had severe crowding in upper anterior and moderate crowding in lower anterior region. Radiological examination

revealed presence of all 3rd molars. Lower right 3rd molar was horizontally impacted (fig. 2). The patient had a vertical growth pattern and mildly procumbent upper and lower incisors.

Treatment Progress

Patient had a compromised buccal occlusion due to the loss of lower first molars as well as grossly decayed upper first molars. The aim of orthodontic treatment was thus to upright the impacted lower right third molar, correct the position of the ectopically erupted canines, close all the remaining extraction spaces orthodontically and restore the loss of masticatory function caused due to loss of the first molars. The orthodontic treatment was started by extracting the grossly decayed upper first molars and then bonding both upper and lower arches with 0.022" MBT (3M Unitek) bracket and subsequently wire progression starting with upper and lower 0.014" NiTi, 0.016" NiTi, 0.019"x0.025" HANT and 0.019"x0.025" SS wire were done. Niti open coil springs were used to gain the space to align the upper canines.

A modified Begg's uprighting spring was used for 3rd molar uprighting (fig. 3, 4) made with 0.014" Special Plus A. J. Wilcock wire. Lower right 2nd premolar bracket was bonded over exposed part of lower right 3rd molar crown (fig. 4, 5, 6) to assist in distal tipping. The patient was seen at 4 week intervals for follow up and reactivation whichever was required. After 5 months the impacted lower right 3rd molar was uprighted. (fig 7, 8). After 14 months of treatment all the lower extraction spaces had closed, the upper and lower canines were in a class I relationship, patient had an ideal overjet and overbite and all the crowding in upper and lower arches were relieved. Post treatment orthopantomograph shows root parallelism and complete uprighting of the mesially impacted third molar (fig. 9). There was incomplete closure of upper extraction spaces when the treatment had to be discontinued due to social circumstances of the patient. Hence a tight buccal occlusion could not be achieved.

III. Discussion

The most common method for treating the impacted right mandibular molars is to extract all of them. However the extraction requires delicate technique as well as careful management to minimize risks of injury to the adjacent teeth and the neurovascular bundle as well as the risk of mandibular fracture. Based on the patient's young age and the potential growth of the facial skeleton, the extraction of the lower left third molar would have caused the supraeruption of the upper left third molar and potential risk of injury to the lower gums. A cantilever bridge taking the support of the lower right second molar would have prevented the supraeruption but the long term prognosis for cantilever bridge is questionable. Distalisation of the lower right second molar and subsequent prosthetic replacement of the first molar by an implant would cost considerable money and time.

A modified Begg's uprighting spring is a simple and effective way of uprighting a tipped tooth. (Fig 3). The distal short arm of spring is secured in bracket bonded over 3rd molar and active long arm is hooked mesial to 2nd molar over the arch wire providing a long lever arm. The impacted molar is usually infraoccluded and requires an eruptive force to bring the teeth into occlusion with its antagonist. There may be slight occlusal interference between the impacted molar and its antagonist or the wire during the uprighting process, but this problem rapidly resolves itself. This uprighting spring elevates the mesial marginal ridge of the impacted molar to the functional occlusal plane. If vertical development of the impacted molar is impeded by its antagonist, then the supra-erupted antagonist must be intruded

The innovation of this kind of using a Begg's uprighting spring in pre adjusted appliance has advantages like it is simple in design, easy chair side construction, simple mechanics, does not require patient's co-operation, inexpensive, easy reactivation, provides rapid tooth movement, no surgical intervention required and comfortable to patient.

Uprighting tipped molars can benefit patients functionally, periodontally and for prosthodontic rehabilitation of mutilated cases. The specific benefits to be gained depend on the directions in which the molar moves, both in the vertical and mesio-distal planes of space⁶⁻⁷. Technique described in this article can be used for uprighting of 2nd or 1st molar as well. The periodontal advantages of uprighting a mesially tipped molar also include elimination of the pseudopocket that often forms on the mesial aspect of these teeth.

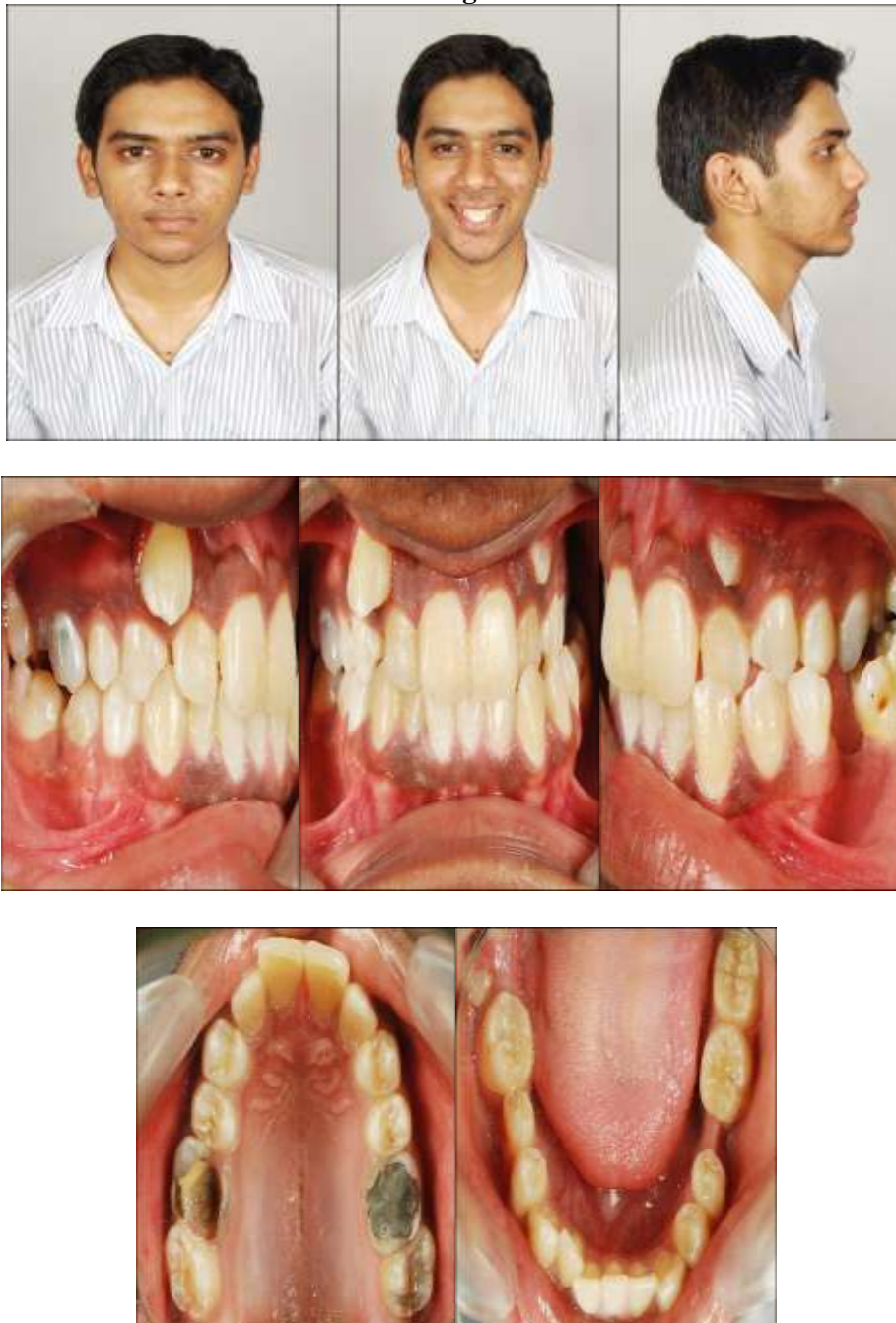
It is commonly suggested by the general practitioners to undergo prosthetic implants in such cases or without extraction. If the tilted teeth are not uprighted before any prosthetic rehabilitation, it may sooner than later lead to failure of the prosthesis and damage to the periodontal apparatus due to ill-directed occlusal forces. It is advisable to general practitioners to seek an orthodontist's opinion in such cases and orthodontic treatment should be encouraged.

According to a review by Lindhe⁸ there was no support for extracting teeth in favour of placing implants. A healthy tooth has a life-long survival rate, which has yet to be shown for the prosthesis or even dental implant. Hence, orthodontic uprighting of the impacted molars, rather than risky tooth extractions, is recommended.

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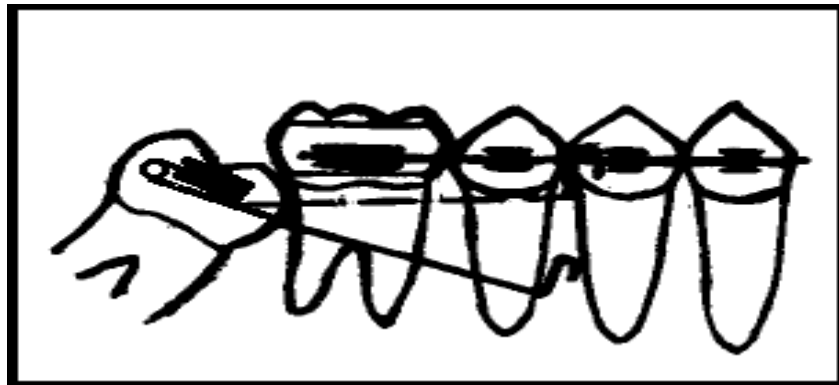
Images



(Pretreatment Photographs Fig. 1)



(Pretreatment radiographs Fig. 2)



(Diagram showing mechanics Fig. 3)



(uprighting spring Fig. 4)



(Photograph With uprighting spring Fig. 5)



(Orthopantomogram with uprighting spring for lower right 3rd molar Fig. 6)



(Photograph after uprighting 3rd molar Fig 7.)





(Post uprighting Photographs Fig.8)



(Post uprighting radiographs Fig.9)

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