

Ortho-surgical Approach for Atraumatic Extraction of Eumorphic Bilaterally Impacted Mandibular Fourth Molars Associated with Enlarged Follicle - A Case Report and Literature Review

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Abstract

A Supernumerary tooth is one that is additional to the normal series and can be found in almost any region of the dental arch with anterior maxilla (mesiodens) and the maxillary third molar region (distomolar or paramolar) being the most frequent sites. Fourth molars or distomolars are situated distal to the third molars that are rarely erupted but usually detected on routine radiographic examination as an impacted tooth.

The etiology of this anomaly has multiple theories but none of them are completely accepted. It is usually associated with genetic syndromes like labio-palatal cleft, cleidocranial dysostosis and Gardner syndrome, with lowest prevalence in healthy individuals.

Occurrence of bilateral distomolar is seen only in 0.07% of population making it a rare condition. Supernumerary teeth are usually asymptomatic, but can sometimes lead to formation of cysts and tumors as well as crowding or delayed eruption of permanent teeth. More often such teeth are kept under periodic observation and are highly challenging to the operating surgeons in making decision whether to retain or remove during its early phase of presentation unless the above-mentioned conditions are noticed.

The present paper reports a case of eumorphic bilateral impacted mandibular fourth molars associated with cystic changes in a non-syndromic young female patient which was managed by staged atraumatic removal of bilateral third and fourth molars using orthodontic traction system minimizing the damage to the adjacent vital structures.

Keywords: Ectopic Tooth; Paramolars; Distomolars; Orthodontic Traction; Supernumerary Tooth

Abbreviations

OPG: Orthopantomography; TMJ: Temporomandibular Joint

Introduction

The term "supernumerary teeth" describes the presence of more than the normal number of teeth. Supernumerary teeth can

be seen in both the primary and the permanent dentitions, but their occurrence is more prevalent in the permanent dentition. Supernumerary teeth can be single or multiple, fully or partially impacted, partially or totally erupted, and unilateral or bilateral. Multiple supernumerary teeth are usually associated with various syndromes, and the conditions commonly associated with an increased prevalence of these cases include cleft lip and palate, cleidocranial dysplasia, and Gardner syndrome. The supernumerary teeth present in the decreasing order of frequency from upper distomolars, upper para molars, and proportionately far behind, lower premolars, upper lateral incisors, lower fourth molars, and lower central incisors [1].

Generally, not all supernumerary teeth require extraction. If its asymptomatic, they can be left in situ and kept under observation. The surgical removal of supernumerary teeth should always be based on the possible associated pathological sequelae. If extraction is recommended, it should be performed carefully to prevent damage to the surrounding anatomical structures. Usually with mandibular disto molars, one must avoid damage to adjacent permanent teeth, the inferior alveolar artery and nerve as well as prevent jaw fracture. The supernumerary teeth appearing distally to the third molar were classified as fourth molars. Their incidence is rare with only a 0.02% reported in the mandible. The fourth molars should be managed much likely as an impacted third molar and in agreement with Dodson who considers that the term “asymptomatic” is ambiguous and insufficient, as the absence of symptoms does not equal the absence of disease [1].

The present case report highlights ortho-surgical approach in management of bilateral eumorphic mandibular fourth molars to minimize the trauma to the adjacent normal structures in non-syndromic female patient.

Materials and Methods

Case Report

A 22yr old non-syndromic healthy female patient reported with a chief complaint of pain, swelling and pus discharge from her right mandibular retromolar region, upon clinical examination peri coronal flap with partially erupted third molar was found on both the sides with pus discharge and tenderness on the right side. Orthopantamograph was obtained as a routine investigation which surprisingly revealed bilateral supernumerary eumorphic mandibular fourth molars associated with enlarged follicle (Figure 1).

Figure 1: Pre-operative radiograph showing eumorphic bilaterally impacted mandibular fourth molars associated with enlarged follicle.

Methodology

Keeping in view the clinical presentation and expected possible complications such as neurovascular bundle damage and fracture of the jaw, a decision was made to remove both mandibular third and fourth molars on either side under local anesthesia by staged surgical intervention with orthodontic traction system using modified lingual arch appliance and elastic linked chain, followed by bilateral prophylactic removal of maxillary third molars.

Procedure

Under strict aseptic condition, the mandibular third molar was surgically extracted and enlarged follicle was removed in toto with thorough curettage. De-roofing of ramal bone over fourth molar was performed to expose distal surface of the tooth using surgical rotary equipment, that aided orthodontist to bond the bracket after thorough isolation and homeostasis (Figure 2). Orthodontic traction was established by elastic linked chain attached to the bracket on impacted distomolar and the second molar buccal tube on lingual arch. The buccal tubes hook was bent perpendicular to the long axis of the tooth in order to provide adequate support and force to pull the distomolar away from the mandibular canal followed by wound closure. The traction force was directed obliquely upwards and the elastic chain link was shifted periodically as and when the tension was lost (Figure 3). OPG's were taken at an interval of 30 days to check the degree of tooth movement and second surgical procedure was performed to extract the supernumerary molar tooth only after complete separation/disengagement of

tooth from the neurovascular bundle (Figure 4a). Similar procedure was attempted on the other side and allowed to heal naturally without placing any graft material within the socket (Figure 4b). The curetted soft tissue was then sent for histopathological examination, where it was suggestive of infected hyperplastic dental follicle.

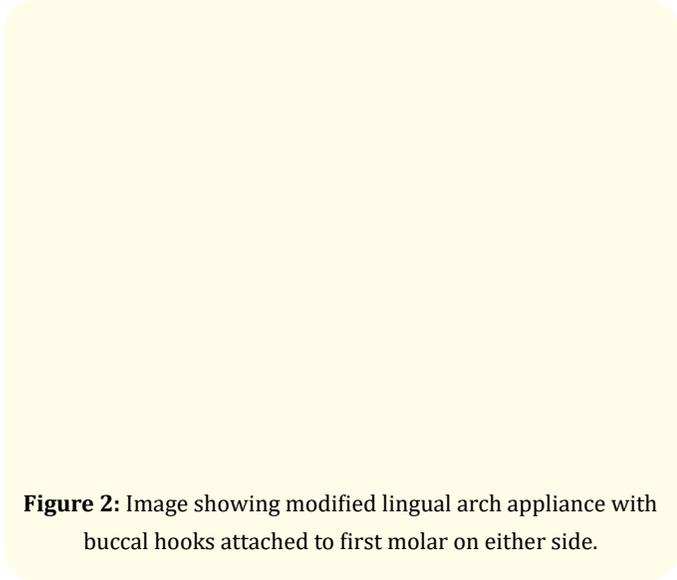


Figure 2: Image showing modified lingual arch appliance with buccal hooks attached to first molar on either side.

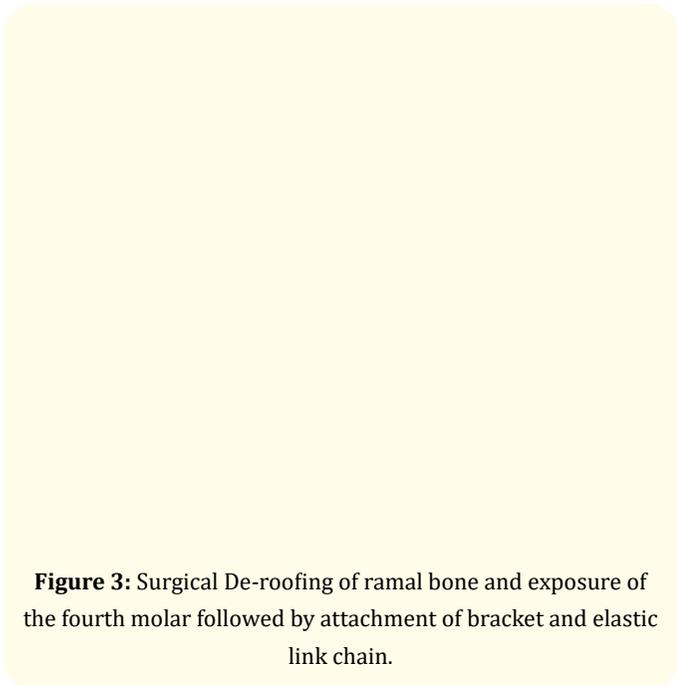


Figure 3: Surgical De-roofing of ramal bone and exposure of the fourth molar followed by attachment of bracket and elastic link chain.

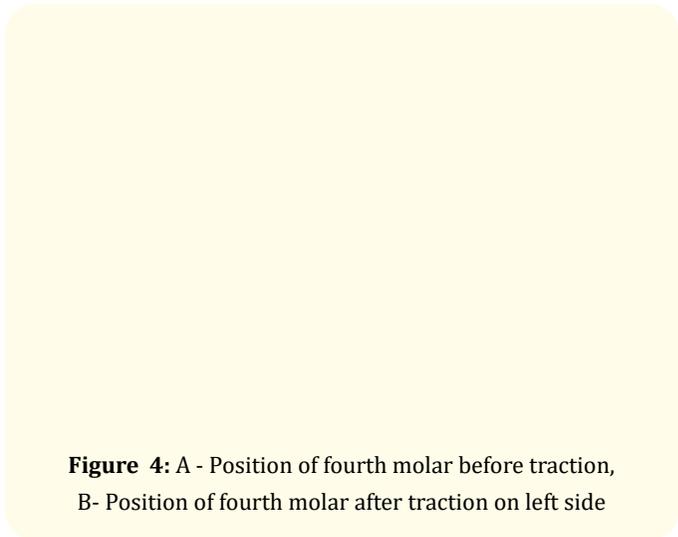


Figure 4: A - Position of fourth molar before traction, B- Position of fourth molar after traction on left side

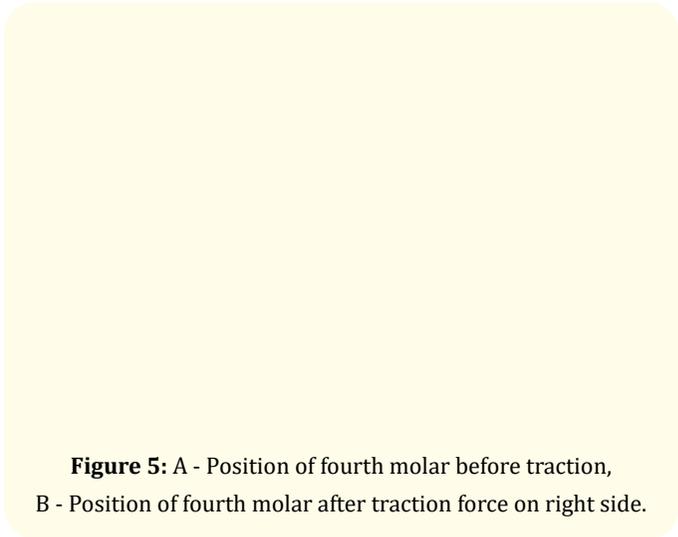


Figure 5: A - Position of fourth molar before traction, B - Position of fourth molar after traction force on right side.

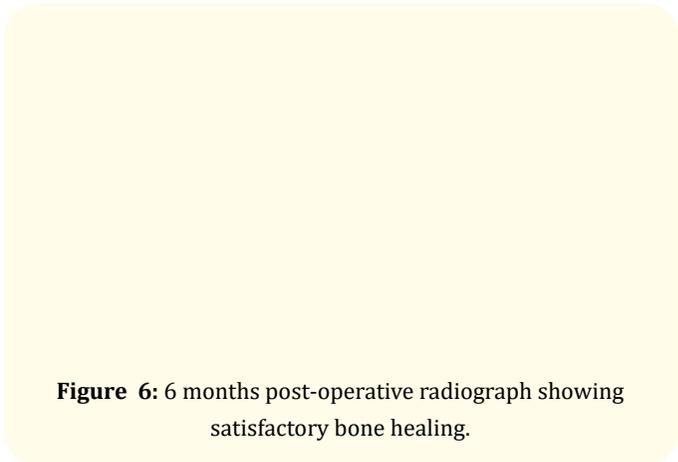


Figure 6: 6 months post-operative radiograph showing satisfactory bone healing.

Results and Discussion

The post-operative period after Initial and final surgical procedures on both the sides was uneventful during 3 months follow up, healing was satisfactory with no post-operative clinical complication such as paresthesia, hemorrhage, trismus, jaw bone weakness or jaw fracture etc. Six months post-operative radiograph revealed satisfactory bone formation with no surgical morbidity on either side (Figure 5).

Supernumerary teeth have a rudimentary shape and usually present as solitary and impacted teeth. The fourth molars are considered as the second or third most frequent group of supernumerary teeth [1].

Fourth molars are also referred to as distomolars, which suggests that they are anatomically located distal to the third molars. The occurrence of distomolars is often associated with developmental disorders like labio-palatal cleft, cleidocranial dysostosis and Gardner syndrome. In this context, the occurrence of this anomaly in healthy patients are unclear with male predominance of 2:1 ratio compared to females. Non-syndromic fourth molars are more common than syndromic fourth molars [2].

Usually, supernumerary teeth are removed surgically, often due to retention of underlying permanent teeth. In cases where the supernumerary teeth do not cause alterations in the eruption, position or integrity of permanent dentition, a conservative approach is preferred, and close observation with regular X-ray is recommended [3].

The ectopic teeth management usually warrants its removal; however, it is important to assess its anatomic location and clinical symptoms for surgical extraction. Several anatomic locations were reported in the literature such as tooth in oropharyngeal region, nasolacrimal region and in the nasopharynx [3,4]. Sometimes the tooth positioned into the nasal cavity may cause certain complications like facial pain, epistaxis, nasal obstruction, paranasal sinusitis, nasal septal deviations, nasal septal abscess, and oronasal fistula and other rare symptoms are hyposmia, hemorrhage, or empyema having a worse prognosis, particularly if orbital or cranial positioning occurs [3,5].

Possible causes of these ectopic molars have been widely debated in the literature which includes trauma, infection and pathology

[6]. These teeth should be managed much like an impacted third molar, and agree with Dodson who considers that the “asymptomatic” is ambiguous and insufficient as the absence of symptoms does not equal the absence of the disease.

Patients must be aware of all risks inherent to their treatment and should be well-advised by the surgeon about the procedure and its possible complications. The treatment of supernumerary teeth can be performed in two ways such as surgical extraction or maintenance of the asymptomatic tooth and periodic monitoring at least once in a year.

In cases where the supernumerary teeth do not alter the eruption, position or integrity of permanent dentition, a conservative approach is preferred and recommended to have close observation with regular radiographs. Usually, the proposed indications for removal of ectopic molars include associated pathology, gross caries, infection, pain/trismus, and recurrent episodes of pain/swelling in the auricular region [6]. As with any surgery, the risks versus the benefits should ultimately be weighed. The risk of damaging neuronal structures and temporomandibular joint (TMJ) components, aesthetic concerns, bony defects after surgery, and the age of the patient should be evaluated before treatment.

As per literature, several approaches have been used, such as pre-auricular, retromandibular, intraoral and recently endoscopic approach. The disadvantage with intraoral approaches is the inability to achieve adequate access, exposure, and lighting to safely remove the tooth and verify complete removal of the associated pathology. This problem was alleviated with the use of endoscopy that has proven effective in providing good visualization and illumination.

Literature also suggests Piezoelectric surgery which is indicated for all osteotomies in which respect to surrounding soft tissues is necessary to decrease the risk of damage to the most critical structures (nerves, vessels, and mucosa).

Studies also reported means of performing orthodontic traction on unerupted normal tooth, such as attachment of orthodontic devices, buttons or brackets, and also use of miniplates for anchorage purpose in uprighting as well as getting the tooth into alignment.

Orthodontic treatment with traction of a tooth can be divided into three phases, the first phase comprises the beginning of ortho-

odontic treatment to surgical exposure of the tooth lasting from two to five months and varying, depending on type of malocclusion and which teeth are involved. The second phase occurs when starting traction, going to the placement of the tooth in the arch, between 12 to 18 months. The third phase is when the orthodontic treatment is finalized with the tooth in the arch. The traction of an unerupted tooth adds between 10 to 18 months to complete orthodontic treatment time [4].

In a study on surgical and orthodontic management of impacted teeth, authors have identified that the position and angulation of the impacted tooth, length of treatment time, available space and the presence of keratinized gingiva as critical factors which will affect prognosis and treatment outcome [5].

Andreasen suggests that surgical exposure with or without orthodontic intervention should be confined to cases with no more than 45% tilting and limited deviation from the normal position [2,7].

Also, some authors have described a case of impacted mandibular second premolar with a tilt of 90° that was surgically exposed after extraction of overlying deciduous tooth followed by its orthodontic extrusion and alignment [8].

The attempt was made to extrude both supernumerary teeth that was at 90° in the present case based on the above said conclusion.

The indication for the orthodontic traction of the impacted canine is more appropriate for cases with better prognosis, such as those of growing patients, without severe arch space deficiencies. Bone loss, root resorption and gingival recession around the pulled tooth are the most common complications of this type of procedure [9].

In order to choose the type of surgical exposure (open or closed) elements like impaction depth, anatomy of the edentulous area and the type of orthodontic force to be employed are some of the factors to be considered. The closed approach is strongly recommended as this replicates the natural tooth eruption with minimal bone removal and provides the best aesthetic and periodontal results [10].

Conclusion

Due to paucity of literature on actual management and considerations on anticipated complications due to its ectopic position;

in the present case scenario, we followed the ortho surgical staged approach and also recommend this technique in removing deep seated impacted mandibular fourth molars or any supernumerary impacted tooth with minimal surgical morbidity.

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Conflict of Interest

We declare no conflict of interest.

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