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Tooth or Odontoma - A Clinical Dilemma

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Case Report

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Abstract: It has been proposed, in an animal model, that it is possible to cause disintegration of a developing tooth bud to such an extent, that it leads to the formation of an odontome. However, such an occurrence in the human dentition has not been described. This paper details the case of an impacted permanent mandibular first molar due to an odontome formed by the disintegrated dental follicle of the adjacent permanent second molar. The impacted tooth showed good eruptive movement and erupted into the oral cavity around 8 months after surgical removal of the obstruction. Keeping the eruptive potential of the tooth in mind, even after the date of eruption is past, a minimal intervention approach can be employed. Considering the dynamic nature of occlusal development, the patient is on long term follow up, till complete maturation of the dentition.
Keywords: complex odontome, disintegrated dental follicle, surgical removal, tooth impaction, permanent first molar.

INTRODUCTION

Massler and Schour have defined tooth eruption as "the process by which the forming tooth migrates from its intraosseous location in the jaw to its functional position in the oral cavity."[1]

However, occasionally, teeth fail to show this eruptive movement and are designated as impacted teeth. Farman has suggested that "an impacted tooth is one that is prevented from erupting due to a physical barrier in the path of eruption"[2].

Impacted teeth may be caused by either systemic or local factors. The systemic factors are usually observed in patients having developmental syndromes like cleidocranial dysplasia, and hence, multiple teeth may be affected. The local causes of tooth impaction may be the presence of obstructions such as supernummery teeth, odontomas, and decreased space in the arch, cysts or the position of neighboring teeth [4].

Impactions of teeth are among the most common developmental anomalies with an incidence of more than 15% in the Indian population [5]. The commonly impacted teeth are the maxillary third molar, the mandibular third molar, the maxillary cuspid, and the mandibular premolars [6]. However, the impaction of the mandibular permanent first molar is a rare phenomenon [5-7].

This paper reports the incidence of an impacted mandibular first molar, due to the presence of an overlying hard tissue obstruction.

CASE REPORT

A 10-year-old female patient reported to the Department of Pedodontics and Preventive Dentistry, A. B. Shetty Memorial Institute of Dental Sciences, with a hard swelling over the lower left border of the mandible in the past 2 months. The swelling was sudden in onset, with gradual progression in size. There was no associated history of trauma or any other presenting symptoms.

On extraoral examination, a bony hard swelling measuring 1x1cm was palpable near the middle of the lower left mandible, with well-defined borders. The surface was smooth and non-lobulated. There was no pain or tenderness to palpation. The

overlying skin was normal. There was no interference to function.

Intra orally, the buccal vestibule posterior to 75 showed slight obliteration with a depression on the alveolus posterior to 75. The left permanent first molar was missing (figure 1A). The contralateral molar had erupted and was in functional occlusion. The opposing tooth showed supra eruption.

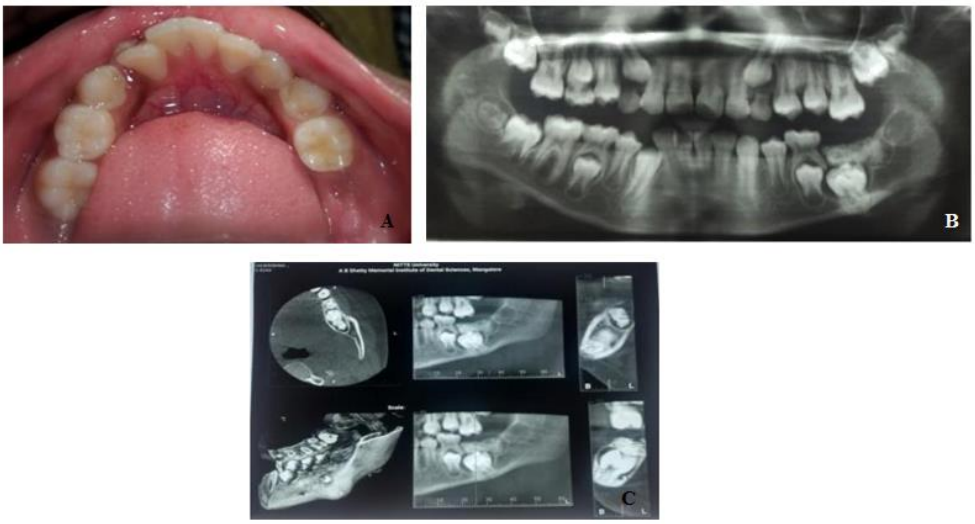

Fig-1: Preoperative images

Fig-1A. Preoperative occlusal view Missing 36, expansion of buccal cortical plate in the region posterior to 75

Fig-1B. Preoperative orthopantomograph Note displaced 36, with thickening of lower border of mandible, indicative of cortical plate expansion

Fig-1C. Preoperative CBCT image Note displacement of 36 to lower border of mandible by a radio-opaque mass; no evidence of loss of PDL space; perforation of buccal cortical plate due to displaced roots of 36.

An orthopantomograph revealed that 36 was displaced close to the lower border of the mandible, with a dense radio opacity lying coronal to the tooth, extending deeply into the crypt of the second molar. The border of the mandible showed thickening. The tooth bud of 37 was missing. No other abnormalities were noted (figure 1B).

To further evaluate the position of 36 and the extent of the overlying obstruction, a CBCT was recorded (figure 1C). 36 was obliquely positioned, with the crown having a lingual tilt and the roots placed buccally. The buccal cortical bone showed a slight perforation due to the angulation of the roots of the tooth. An odontome like structure was present coronal to the tooth, which had presumably caused the shift in tooth position. The radio opaque mass showed a continuous radiolucent shadow at all positions, similar to the appearance of a dental follicle. The tooth apex appeared open, with a continuous lamina dura, suggesting that it was not ankylosed to the surrounding bone. The inferior alveolar nerve canal was traced and it appeared to lie in close proximity to the roots of the displaced tooth.

Therefore, a clinical diagnosis of an impacted 36 associated with an odontome like structure overlying it; probably preventing its eruption was proposed. The cause of the odontome was suspected to be the disintegrated tooth follicle of 37. The treatment of choice was the removal of the obstructive lesion followed by long term follow up of the eruption status of the first molar. An informed consent was obtained from the patient and the treatment was carried out.

The surgery was performed under local anesthesia and the mass was removed (figure 2). The bony cavity extended distally towards the region of 37. An IOPAR was taken to ensure complete removal of the hard tissue. A thick soft tissue lining was present around the entire cavity which was thoroughly curetted. The excised tissue was sent for histopathological examination. Primary closure was achieved and the post-operative course was relatively uneventful.

Fig-2: Surgical protocol
Fig-2A. Reflection of full thickness mucoperiosteal flap
Fig-2B. Excision of obstructive hard tissue in multiple fragments
2 Fig-C. Visualization of coronal aspect of 36
Fig-2D. Excised tissue sent for histopathological examination

The histopathological evaluation reported the presence of both, hard and soft tissue. The hard tissue showed a diffuse mass of dentinal tubules, along with pulp and spaces resembling enamel space. The soft tissue lining showed collagen fibres, fibroblasts and blood vessels and was non-specific in nature. The report confirmed the clinical diagnosis of a complex odontome.

After 8 months, the tooth cusps appeared in the oral cavity (figure 3). The patient had no associated signs and symptoms. The bony hard swelling had reduced to a mere elevation.

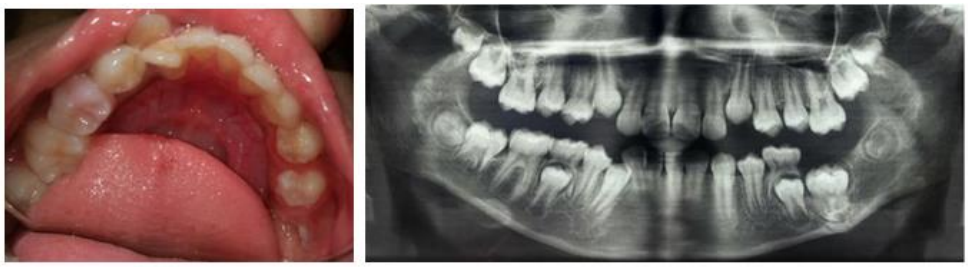

Fig-3: Postoperative images
Fig3A: Postoperative orthopantomograph. 36 show movement in occlusal direction, with dilacerated roots. Cortical expansion slightly reduced.
Fig-3B: Postoperative occlusal view Cusp tips of 36 visible intraorally

Prognosis

Soon after removal of the obstructive mass, the tooth showed occlusal movement, and within 8 months appeared in the oral cavity. The direction of eruption of permanent molars may be modified by the use of uprighting springs, brass wires, separating bands or even by surgical means [8, 9].

As the third molar is in an initial stage of development, it is possible that it may drift into the position of the second molar and come into good occlusion. The patient is being maintained on long term follow up

DISCUSSION

Considering that the tooth bud of 37 does not show development even after 8 months of surgery, it is possible that the tooth bud is missing, or has disintegrated to form the complex composite odontome.

Although the disturbed eruption of the permanent first and second molars is rare, they have considerable clinical implications. The various consequences are a short lower facial height, follicular cyst formation, pericoronal inflammation, tilting of neighboring teeth, resorption of roots of neighboring teeth and malocclusion [3].

This alteration in eruption could result due to obstruction of the erupting tooth by local causes, like odontomas. The term „odontome" in medicine and dentistry was originally used for any tumor and/or tumor-like lesion arising from tooth forming tissues. Today, odontomas are recognized as hamartomas of aborted tooth formation and the most common benign odontogenic tumors [10].

An impacted tooth is, "a tooth that is prevented from erupting into position because of malposition, lack of space, or other impediments," as defined by Mead [11]. Impacted teeth may cause pathological changes such as various cysts or tumors, resorption of adjacent teeth, referred pain or periodontitis [12].

Mellor in 1981 published a series of cases on non-eruption of the permanent lower first molar, in which he found one case of a developing complex odontome with associated calcifying odontogenic cyst preventing the eruption of the molar. Another case of a complex composite odontome displacing the molar to the lower border of the mandible was also reported [13].

A complex odontome developing from a mal-positioned third molar tooth bud and causing impaction of the adjacent second molar was reported, with the lesion being removed under local anesthesia [14]. Enucleation of a complex odontome that had erupted into the oral cavity has been reported. The impacted second mandibular molar erupted into functional occlusion in 6 months after surgery [15].

Levy reported that trauma to a tooth bud can cause formation of an odontome as well as impaction of the traumatized molar. He suggested that this was due to the separation of a small section of partially differentiated epithelial cells from the developing tooth [16]. It has also been suggested that it is possible for a tooth follicle to disintegrate following trauma and form an odontome [17]. Although there is no recorded history of trauma in this case, it is speculated that a similar situation may have occurred.

Frank has suggested 4 treatment options for impacted teeth, involving observation, intervention, relocation and extraction [12].

The phase of intervention begins when it is clear that merely keeping the developing dentition under observation will not be beneficial for the patient. The intervention should be minimal and should enable the natural eruptive process of the tooth. This favors normal development of the interdental septa and formation of adequate keratinized gingiva.

Considering the absence of ankylosis of the impacted tooth, in this case, we decided to opt for a minimal intervention with removal of the obstructing tissue and then observed for the tooth to erupt spontaneously.

It has been suggested that eruption of molars after 7 years is impossible [12], however, we noted an eruptive potential even at the age of 10 years. This demonstrates the principle that following the removal of pathology, the body has a tendency to return to a normal state as far as possible.

CONCLUSION

Although there is abundant literature on the impaction of teeth due to the presence of odontomes, they are more common in the anterior maxilla as compound composite odontomes. The complex composite odontomes occur largely in the posterior mandible, but less frequently. However, to our knowledge, this is the first report detailing the impaction of a tooth due to disintegration of the adjacent dental follicle.

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