



MANAGEMENT OF AN IMPACTED MAXILLARY CENTRAL INCISOR IN A PATIENT WITH A COMPOUND ODONTOME. - A CASE REPORT

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ABSTRACT

Maxillary permanent incisor impaction is not a frequent case in dental practice, but its treatment is challenging because of its importance to facial esthetics. In this reported case, the orthopantomogram of a 13-year-old girl revealed a compound odontome in the maxillary anterior region, which was interfering with the eruption of the permanent central incisor. Odontomas are hamartomas of aborted tooth formation. They come under the classification of benign calcified odontogenic tumors. These odontogenic tumors are composed of enamel, dentine, cementum and pulp tissue. They commonly occur in permanent dentition. Sometimes these tumors are associated with delayed tooth eruption, impaction, or primary tooth retention. The compound odontome was surgically removed, the impacted maxillary central incisor was repositioned in the arch by orthodontic force as it was situated very high in the arch, close to the nasal floor and alignment was achieved with 0.014 mm NiTi wire.

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INTRODUCTION

Odontomas are benign tumors of odontogenic origin combining mesenchymal and epithelial elements.^[1] Odontomas constitute about 22% of all odontogenic tumors. They are more common in females. The term odontoma was first coined by Paul Broca (1866). Odontomas are defined as a tumor formed by an overgrowth of complete dental tissues. They are usually seen in permanent dentition, but they are reported with primary dentition as well.^[2,3]

Histologically, odontomas are composed of enamel, dentine, cementum and, in some cases, pulp tissue. Clinically, odontomas are asymptomatic lesions often associated with alterations in tooth eruption. The diagnosis is made on routine radiological studies, or on evaluating the cause of delayed tooth eruption.^[1] Compound odontomas are usually not associated with bony expansion, but complex odontomas can cause marked bony expansion.^[2]

Compound odontomas are usually seen in the anterior region of maxilla, over the crowns of unerupted teeth or between the roots of erupted teeth. Complex odontomas are mostly seen in the mandibular posterior region. The presence of odontomas is also reported in areas like maxillary sinuses, pituitary region, subcondylar region, ramus of the mandible, middle ear, and midpalatal region. However, these are rare cases. The lesions are unilocular that contain multiple radio-opaque miniature tooth-like structures known as denticles.^[4]

Gravey et al. classified compound odontomas as:

1. **Denticulo type:** Composed of two or more separated denticles having crown and root, dental hard tissue resembling that of the tooth.
2. **Particulate type:** Composed of two or more separate masses or particles, bearing no resemblance to the tooth.
3. **Denticulo-particulate type:** In this both denticles and particles are present together.^[4]

Ideally odontomas should be removed when the permanent tooth adjacent to the lesion shows about the one-half of its root development so that the tooth eruption will not be disturbed. Kaban reported that odontomas are easily enucleated and adjacent teeth that may have been displaced by the lesion are seldom harmed by the excision because they are usually separated from the lesion by a septum of bone.^[5] The early diagnosis of odontomas reduces the chance of development of malocclusion and pathological changes in that region.^[6]

After removal of the obstacle from the path of eruption, an impacted tooth either erupts spontaneously if it has conserved its eruptive force or orthodontic force is required to bring the tooth in normal position. This case report describes the management of a central incisor impaction, caused by a compound odontome in the path of its eruption, both by surgical and orthodontic approach.

Case report

A 13-year-old female patient came to the Department of Pediatric Dentistry, P.M.N.M Dental College and hospital,

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Bagalkot, with the complaint of presence of a milk tooth in the upper front region.

History and intraoral examination

There was no significant medical history. Visual inspection of that area revealed retained primary incisor (Figure 1). On palpation, the gingiva of maxillary incisors area was found to be very hard. No bulging was found during primary inspection.



Figure 1 Pre-operative photo showing over-retained primary incisor

Radiographic examination

The orthopantomogram revealed a well-defined multiple radio-opaque mass similar to the density of dental tissue (Figure 2). It was placed between the roots of left primary central and lateral incisors. An impacted permanent central incisor was seen apical to the radio-opaque mass. The findings were confirmed with an intraoral periapical radiograph. Another radiograph was taken by shifting the X-ray tube to more left side to know the position of the mass (tube shift technique). The radio-opaque mass moved to the opposite side which confirmed its labial position.



Figure 2 OPG and IOPAR showing radioopaque mass between impacted maxillary central incisor and lateral incisor

Based on history, clinical examination and radiographic examination, the provisional diagnosis made was an odontome. Differential diagnosis included multiple supernumerary teeth, adenomatoid odontogenic tumor, and calcified epithelial odontogenic tumor.

So, a decision was made to extract the primary incisor, surgical excision of the odontome followed by orthodontic repositioning of 21 from the labial aspect.

Treatment done

Edgewise brackets were bonded on 11, 12, 22 and 23 prior to the surgical procedure. Adequate local anesthesia was administered and the over-retained primary incisor was extracted. Then, a full thickness mucoperiosteal flap was raised from 12 to 23. The mass was not visible immediately

after flap elevation. It was located under a thick hard bony covering. After an adequate bone removal, the lesion was exposed (Figure 3).

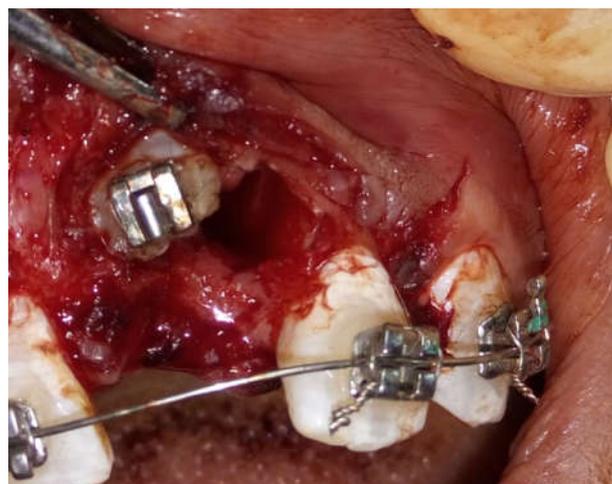


Figure 3 Flap reflected, odontome removed, Begg's bracket bonded to impacted incisor

The lesion contained ten tooth-like small structures (Figure 4). All of the hard tissue was removed and the cavity was curetted. The sharp bony edges were removed using bone ronger and smoothed with a bone file. Intraoral periapical radiograph was taken to make sure complete removal of the lesion immediately after the procedure.



Figure 4 Ten mini tooth-like structures along with cyst lining removed from the lesion

The impacted incisor was exposed and a Begg's bracket was bonded on the crown. A ligature wire extending from the bracket bonded on the impacted incisor was tied to the archwire thereby causing forced extrusion of the impacted incisor (Figure 5).



Figure 5 Orthodontic traction given to impacted incisor with a ligature wire and stiff stainless steel arch wire



Figure 6 2 weeks follow up

The flap was closed and sutures were placed. The specimen was sent for histopathological examination and a confirmed diagnosis of a compound odontome was given later. The patient was recalled at 4-week intervals for tightening the ligature wire. After two visits, the right central incisor erupted into the oral cavity. 0.014 NiTi wire was engaged in the Begg's bracket (Figure 7) which was eventually replaced with an edgewise bracket, when the incisor erupted further, to achieve final alignment (Figure 8). Full alignment was achieved in 5 months (Figure 9). The aligned maxillary incisor remained vital and responded normally to percussion and mobility and sensitivity testing.



Figure 7 0.014 NiTi wire engaged in the Begg's bracket (4 weeks post-op)



Figure 8 Begg's bracket replaced by an Edgewise bracket (3 months post-op)



Figure 9 Final alignment achieved in 5 months

DISCUSSION

Odontoma is the most common type of odontogenic tumor, and some authors called it as hamartoma, not a true tumor.^[4] Hitchin suggested that odontomas inherited through a mutant gene or interference, possibly postnatal, with genetic control of tooth development. In humans, there is a tendency for the lamina between the tooth germs to disintegrate into clumps of cells. The persistence of the lamina may be an important factor in the etiology of complex or compound odontomas, and either of these may occur instead of a tooth.^[7]

Clinically odontomas are either complex or compound, and classified as follows:

- Intraosseous: These odontomas occur inside the bone and may erupt into the oral cavity.
- Extraosseous or Peripheral: Odontomas occurring in the soft tissue covering the tooth bearing portions of the jaws.^[8]

A visual examination of the lesions cannot by itself define the differences between the complex and the compound types, because the odontomas are usually in the bone structures and do not show outward signs, such as expansion of the bone. Even in rare instances in which odontomas erupt into the oral cavity, the surface appearances of both types of odontoma are similar and differentiation between them is difficult. In comparison to visual examination and manual palpation, radiographic examination is the most effective clinical method of discrimination between two types. In case of compound odontoma, radiographic image shows comparatively well-organized malformed teeth or tooth-like structures, usually is a radiolucent cyst like lesion. Whereas, a complex odontoma shows an irregularly shaped oval radiopacity usually surrounded by a well-defined thin radiolucent zone. In case of compound odontoma in which extremely small, conglomerated malformed teeth or tooth-like structures are numerous, the radiographic image is similar to that of complex odontomas and a differentiation between the two types may be difficult.^[2] Odontomas have a limited growth potential, but they should be removed because they contain various tooth formulations that can predispose to cystic change, interfere with eruption of permanent teeth and cause considerable destruction of bone.^[9] Because of the very low recurrence, the treatment of choice is surgical removal of the lesion. As it is a capsulated tumor, its removal is a simple surgical procedure but special care should be taken to remove it totally in order to avoid a relapse which is specially critical in immature complex odontomas. Odontomas are easily enucleated and adjacent teeth that may have been displaced are seldom harmed by surgical excision because they are usually separated by a septum of bone. But sometimes due to extension of the odontomes, the adjacent tooth might be disturbed while removal of the odontomes.^[2]

In this case, we used a combined surgical and orthodontic approach to deal with the impacted central incisor. The disadvantage of the combined surgical/orthodontic therapy is required a longer treatment period and some complication including ankylosis, non-vital pulps and root resorptions may be encountered. When an extensive amount of bone is removed or an open approach method is used to expose the impacted teeth, surgically, periodontal complication can be occurred such as gingival recession, delay in periodontal

healing, gingivitis, bone loss and decrease in the width of keratinized gingiva.^[10]

CONCLUSION

The presence of a compound odontome may result in the failure in eruption of adjacent permanent incisors. Usually, odontomas do not recur, but close monitoring is necessary in young children till permanent teeth erupt into normal occlusion. Maxillary permanent incisor was successfully positioned in the maxillary arch by surgical removal of the odontome and orthodontic traction, which showed good stability. Long-term monitoring of the stability and periodontal health of the impacted incisor should be evaluated following orthodontic traction.

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