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Case Study

Managing an Odontoma Associated with Impacted Maxillary Incisor in Adult Patient: A Case Report

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Abstract

Background: Odontomas are known as the most common form of odontogenic tumour composed of mixed odontogenic origin. These are usually discovered accidentally during routine or diagnostic radiographic investigation. Compound odontomas often present themselves in the maxillary incisor-canine region while complex odontomas are found in the mandibular premolar-molar region. Odontoma though symptomless occasionally can interrupt the eruption of underlying teeth causing aesthetic and occlusal discord especially in the anterior maxilla region. **Case:** A 31-year-old female presented with pain and presence of an abnormally shaped tooth on her upper right anterior maxilla region. The tooth was diagnosed as compound odontoma and causes an impact of an underlying maxillary lateral incisor. Surgical assisted eruption of the impacted lateral incisor was done after removal of the odontoma, followed by exposure of the impacted tooth crown and gradual orthodontic-guided traction into occlusion. **Conclusion:** A combined (surgical-orthodontic) approach is deemed to have a higher prognostic value and optimal outcome for the impacted maxillary incisor associated with odontoma.

Keywords: *Impacted Tooth; Odontoma; Surgical Assisted Eruption*

Introduction

Odontoma are described as an abnormal mass comprised mainly by calcified tissue of dental origin divided into two types namely, complex and compound odontoma. There is no gender predilection and odontomas can occur anywhere on the jaw however compound odontomas are common in the anterior region while complex odontomas appear more at posterior jaw area (Shah *et al.,* 2023).

Aetiology of odontoma includes trauma and infection at the site of the lesion with possible relationship with primary dentition, remnant rest cells of Malassez, inflammatory reactionary process, odontoblastic hyperactivity and hereditary anomalies such as Gardner syndrome, basal cell nevus syndrome, Tangier disease and Hermann syndrome (Ariasmi *et al.,* 2019). Generally, these lesions are asymptomatic, mainly owing to their slow growth rate and self-limiting size with the occasional complex odontomas formation that may result in jawbone expansion (Gargi, SM & Nagaraju, 2018). Odontomas also becomes clinically significant if it causes impedance of normal teeth eruption, primary tooth retention, and abnormal tooth positioning (Shah *et al.,* 2023). The treatment of choice for odontomas is conservative surgical enucleation as its recurrence rate is reported low (Damayanti *et al.,* 2024). However, when faced with a situation where there is presence of impacted tooth blocked by an overlying odontoma then a straightforward enucleation is insufficient to allow the full functionality of the impacted

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tooth. The treatment needs are more significant, particularly if the tooth impaction occurs in prominent region like anterior maxilla. In this article we aim to provide a description regarding management of an impacted maxillary tooth caused by an odontoma in the anterior maxilla region.

Case Presentation

A 31-year-old female came to our clinic with concern regarding an abnormally shaped mass on her upper right anterior jaw region that was aesthetically non-harmonious with the rest of her dentition. Patient denies any history of pain and discomfort but claimed that her elder sister has a similar presence of abnormal looking mass in her jaw. On oral examination, a partially erupted irregularly shaped mass is present on the right anterior maxillary arch with clinically missing maxillary right lateral incisor (Figure 1) The lesion was stony hard, measuring 0.5 cm in diameter with no sign of pain on manipulation. Overlying gingival mucosa around mass appears pinkish and healthy. Dental vitality test done on adjacent teeth was normal. Cone-Beam Computed Tomography (CBCT) scan revealed a singular well-defined radiopaque mass with radiolucent rim located over an impacted maxillary right lateral incisor (Figure 2). A preliminary diagnosis of odontoma was made. Differential diagnosis included supernumerary tooth, fibro-osseous tumour and calcifying odontogenic cyst. Accordingly, a complete surgical enucleation of the lesion was proposed. However, considering the patient's impacted incisor underneath the tumour, an additional procedure of surgically exposing the impacted incisor's crown with direct bonding of orthodontic lingual button was also suggested. This, in turn, will allow the lateral incisor to be gradually tractioned orthodontically into occlusion. The proposed treatment plan was accepted and consented by the patient.

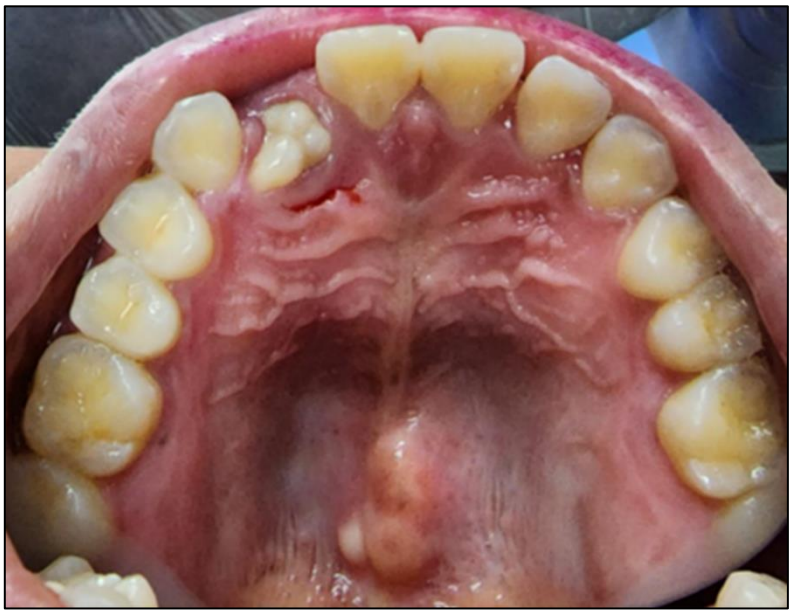

Figure 1: View of Maxilla Showing a Pearl-Like Mass Between Incisors

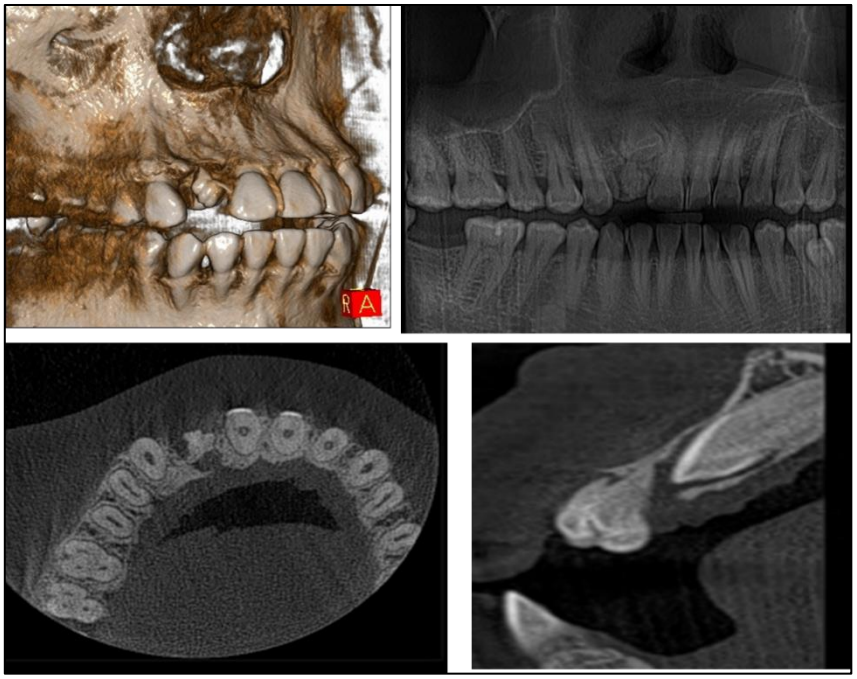

Figure 2: Pre-Operative Multiplanar View of CBCT Depicting Presence of a Radiolucent Mass with Rudimentary Tooth-Like Feature

Perioral structures were disinfected using 10% Povidone iodine solution while the oral cavity was disinfected with 0.12% chlorhexidine gluconate mouthwash solution and draped to minimize cross contamination. 3 ml of local anaesthesia containing 2% Lidocaine with epinephrine 1:100,000 was delivered as anterior superior alveolar nerve block and nasopalatine nerve block. Accordingly, the calcified mass was removed completely in 2-pieces using standard dental elevators and dental extraction forceps via alveolar approach. The extracted mass appears as a rudimentary tooth but not conforming to typical morphology (Figure 3). The mass was removed successfully without damaging the underlying right maxillary incisor and was sent for histopathological examination. Mucosal incision with full thickness mucoperiosteal flap was done to expose the impacted crown. A thin bone layer was cleared off with surgical round bur to expose the underlying impacted tooth's crown surface (Figure 3). The exposed crown area was copiously irrigated with normal saline, and haemostasis was achieved by means of direct pressure. A lingual button (3B ORTHO, China) was bonded onto the crown surface using Transbond™ XT Light Cure Adhesive (3M Unitek, Malaysia). A standard 0.17 mm medical grade stainless steel wire was fashioned into a traction wire. The wire was looped around the button and its end was fixed onto the adjacent central incisor (Figure 3).

Orthodontic fixation was done using Mini Master® Bracket (American Orthodontics, Washington, USA) and FLEX-A-DENT™ nickel titanium archwire (Adento GmbH, Germany) for the maxillary dentition. However, 3 months postoperative review shows very little movement of the impacted lateral incisor, and the exposed gingival mucosa has overgrown to close over the exposure site (Figure 4). A bloodless surgery to re-expose the crown surface using EPIC 10™ 940nm Classic Diode Laser (BIOLASE, California, USA) was done. The lingual button was detached and had to be removed before a new orthodontic bracket was bonded over the crown surface. The bracket was ligated with remaining orthodontic fixtures to allow the gradual descent of the impacted tooth (Figure 4). Histopathologic examination of the mass reported that it was consistent with features of compound odontoma. Subsequent clinical and radiographic follow-up did not reveal any sign recurrence nor any other untoward complications. The patient continues to be on regular follow-ups under our care as the impacted tooth erupts gradually into normal occlusion.

Figure 3: Tooth-Like Masses Removed Followed by a Buccal Bony Window Creation to Expose Impacted Maxillary Incisor Crown and Bonding of Lingual Button Its Surface, Anchoring It to Adjacent Teeth

Figure 4: Exposure Site Covered by Mucosa Again Requiring a Second Bloodless Surgical Exposure with Laser and Orthodontic Bracket Applied for Traction

Discussion

Odontomas often cause disturbances in the tooth eruption leading to impaction or delayed eruption of dentition, retention of primary teeth and abnormalities in tooth position, particularly causing tipping or displacement of adjacent teeth (Kannan *et al.,* 2013). In our case, the right maxillary permanent lateral incisor was noticed to be impacted due to the overlying odontoma.

World Health Organization currently categorizes odontoma into three types namely complex odontoma, compound odontoma and ameloblastic fibro-odontoma (Wright & Vered, 2017). Complex odontoma is described as an uneven mass of calcified tooth tissue conglomerate with no organization in structure pattern thus, it does not possess morphological similarity to even a rudimentary tooth. Contrastingly, compound odontoma has all the normal odontogenic tissue component which is structurally arranged in organization forming various structure resembling teeth, but it does not morphologically fit into the typical teeth form. Ameloblastic fibro-odontoma is considered a developing form of odontoma composed of assorted amount of calcified odontogenic tissue as well as tissue resembling dental papillae.

A previous cited study reported that 61% of compound odontoma are observed in the anterior jaw while 34% complex odontoma are seen in the posterior jaw (Shah *et al.,* 2023). Other studies also reported that complex odontomas are common in the mandibular molar-premolar region while compound odontomas are found in the maxillary incisor-cuspid region (Prabhadevi, 2017). This is consistent with the findings in our case. Radiographically, odontomas are reported as well-defined radio-opacities located in the jaw region. A radiolucent halo, typically rimmed by a thin sclerotic line, surrounds the radio-opacity. We have noted a similar feature of well-defined radiopaque toothlike structure in our patient's CBCT scan.

Odontomas are a self-limiting encapsulated lesion with low risk of recurrence. Early diagnosis and conservative surgical excision of odontoma improves prognosis, reduces recurrence and untoward complications (Abdul, Pragati & Yusuf, 2014; Alarcón Apablaza *et al.,* 2024). However, in the presence of tooth impaction it is imperative that the tooth's conservation and repositioning within dentition is taken

into account (Gargi, SM & Nagaraju, 2018). This has been consistent with our approach showcased in this case report. Annual periodic follow-up review is also necessary to assess postoperative healing and monitor potential recurrences if any.

Conclusion

This case report means to impress the point that atraumatic removal or enucleation of the odontoma lesion as early as possible is the simplest option with good prognostic value. However, in the presence of an impacted tooth closely associated with odontoma, there are various treatment options to consider but an optimal treatment choice should support an effort to preserve the aforementioned impacted tooth. We have in this case, opted a combined surgical and orthodontic intervention to provide the most optimal outcome for the impacted lateral incisor affected by odontoma.

Conflict of Interest

The authors declare that they have no competing interests.

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