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Case Report

Surgical treatment of complex odontoma in anterior maxilla – A rare case report

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ABSTRACT

Odontomas are the odontogenic tumour which are benign whose origin is from epithelial and mesenchymal cells. These have a high incidence rate and are widely acknowledged as hamartomas. Odontomas are mainly made up of enamel and dentin, with differing amounts of cementum and pulp. The aetiology is not known yet, the hypothesized causes are: local trauma, infection, inheritance and genetic mutation. Most of these lesions are not symptomatic and are frequently diagnosed on routine radiographs. They are divided histologically into complex and compound odontomas.

These are generally diagnosed in the posterior region of the mandible and resemble haphazardly arranged tooth-like structure. Here, we report the case of a patient who is 21 years of age with a complex odontoma-related impaction of permanent maxillary right central incisor which was managed by surgical excision through palatal approach.

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1. Introduction

Odontomas are the most frequently occurring odontogenic tumours of the jaws, with slow growth and nonaggressive behaviour.¹ The word "odontome" was first used by Paul Broca in 1867, who described it as "tumour caused by overgrowth or transitory of complete dental tissue." It is benign, asymptomatic, slow-growing, and non-aggressive. Enamel and dentin are always present in these tumours, while cementum and pulp content may also be present in varying levels.²

The WHO classification of odontoma based on histopathology: (a) complex odontomas, (b) compound odontomas. In complex odontomas, the dental tissues are well formed however show irregular arrangement; whereas in compound odontomas, the dental tissues are normal however their size and conformation are altered, forming

numerous small structures which resemble teeth called denticles. Compound odontomas are common than complex odontomas.³

Odontomas are divided into three categories based on their clinical features: central (inside the bone), peripheral (occurs in the soft tissue), and erupted (which displays outside the bone).⁴

H.M. Worth also divided odontomes into three categories: ectodermal (Enameloma), mesodermal (Dentinoma, Cementoma), and mixed ectodermal and mesodermal origin (complex composite odontome, compound composite odontome, geminated odontome, dilated odontome, including dens in dente).⁵

Anywhere in the dental arches can have these odontogenic tumours. Most commonly complex odontomas are found in posterior region while compound odontomas are found in anterior region.⁶

Odontomas are typically seen during regular radiography, but when they lack calcification, they can

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be challenging to identify. The typical treatment for odontomas is conservative surgical resection. After therapy, the prognosis is quite good, with little likelihood of recurrence.⁷

2. Case Report

A male patient of age 21 years was referred to the department of Oral and maxillofacial surgery from primary health centre with complaint of missing teeth in maxillary anterior region. Patient had no relevant past medical history. The patient was conscious, co-operative and oriented to time, place and person. The patient was vitally stable. There was no significant extraoral finding. Intraoral examination showed palatally erupting central incisor in maxillary arch on right side. (Figure 1 B)

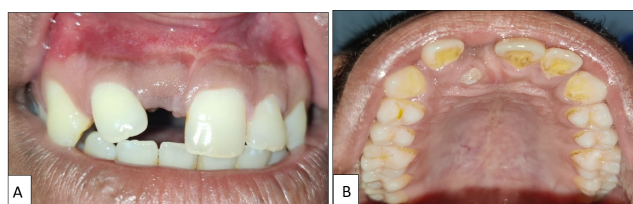


Fig. 1: A): Intraoral photograph; B): Occlusal view shows incisal tip of central incisor

Radiographic examination (panoramic radiography) showed a well circumscribed radiopaque mass with a surrounding radiolucent rim above the displaced and dilacerated central incisor.

(Figure 2). A CT scan with the Carestream software was made so as to locate the extension of the lesion and the anatomy to visualize the permanent central incisor which was not erupted yet with respect to the lesion. It revealed uniform radiopaque mass with a density more than that of bone and similar to that of the teeth. (Figure 3). We came to the provisional diagnosis of odontoma based on the clinical and radiographical features with other differential diagnosis including calcifying odontogenic cyst, calcifying odontogenic tumour, fibro-osseous lesion, ameloblastic fibro-odontoma and osteoblastoma.

The excision of odontome along with the impacted central incisor was decided in consultation with the patient and his orthodontist. The patient received 1.2 g of amoxicillin and clavulanic acid before one hour as preoperative antibiotic. Under local anaesthesia (2% lignocaine with 1: 200,000 adrenaline), a full thickness palatal flap was raised from distal of right first premolar to the distal of left first premolar. (Figure 4 A) The impacted central incisor and the odontome was exposed by removing the bone palatally using low-speed straight handpiece and round bur no.8. The tooth was extracted using No.9 Moltz mucoperiosteal elevator. The odontome was split using straight handpiece and straight fissure

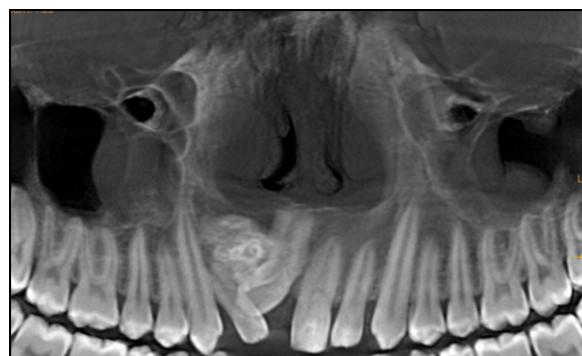


Fig. 2: Preoperative OPG reveals a well-defined radiopaque mass with a surrounding radiolucent rim above the displaced and dilacerated central incisor

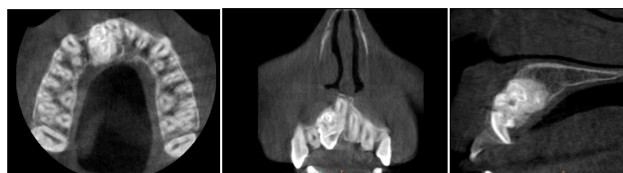


Fig. 3: CT scan (axial, coronal and sagittal views)

carbide bur No.702 and was removed in two parts from the maxilla preserving the bone support to right lateral incisor. The cavity was thoroughly curetted and irrigated with physiologic solution and 5% betadine solution (Figure 4 B). The bony defect was packed with absorbable gelatin sponge (Gelfoam)(Figure 5 A). After achieving hemostasis, the mucoperiosteal tissue was realigned and sutured with 3-0 resorbable sutures.(Figure 6) The diagnosis of complex odontoma made by the clinical and radiographic evaluation was supported by the histological study of the sample. Following surgery, the patient's recovery was uneventful. The patient was prescribed with Tab. amoxicillin and clavulanic acid (625 mg BD for 5 days), Tab. paracetamol (500mg BD for 5 days, Tab. pantaprazole (40 mg OD for 5 days) and Chlorhexidine(CHX, 0.2%) mouthrinse.

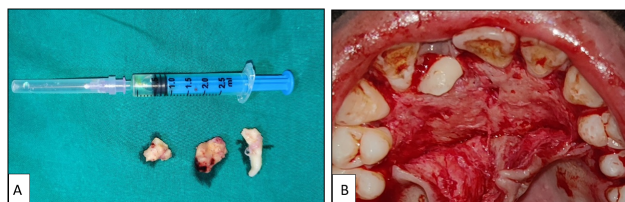


Fig. 4: A): Mucoperiosteal flap elevation and exposure of permanent central incisor; B): Bony cavity after extraction of central incisor and excision of odontoma

The patient was referred to orthodontist for correction of malocclusion following which the patient will be rehabilitated with an implant supported prosthesis.

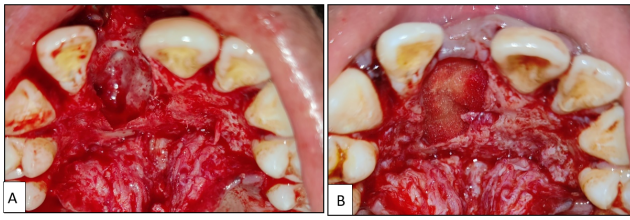


Fig. 5: A): Bony cavity packed with Absorbable gelatin sponge; B): Excised specimen along with the extracted permanent central incisor



Fig. 6: Immediate post op



Fig. 7: Follow up at 3 months



Fig. 8: Post operative Panoramic radiograph at 3 months follow up

3. Discussion

Odontomas are hamartomas, which make up 22% of odontogenic tumours.⁸

They are the most predominant benign odontogenic tumours originating from epithelial and mesenchymal cells.⁹

Odontomes were first classified by Shafer, Hine, and Levy in 1974 as tumours with odontogenic origin, however their current view is towards that an odontome is a hamartoma. Odontomas are defined as any tumour of odontogenic origin. This is because odontomas are formed by the development of totally differentiated epithelial and mesenchymal cells which forms ameloblasts and odontoblasts.¹⁰

Most odontomes occur in the age group of 10-20 years, with mean age of 14 years.

Compound composite (61%) and complex composite (34%) are the two most prevalent types in the anterior and posterior jaw segments, respectively.¹¹ They are mostly related with an impacted tooth and rarely with a dentigerous cyst. The right side of the jaw had both types of odontomas more often than the left (compound 62%, complex 68%). Opposing with the complex odontome, that were typically found in the molar and premolar region of the mandible, the compound composite odontome occurred more often in the incisor cuspid region of the maxilla.² Though complex odontomas are located in the posterior region of the jaw, Chang¹¹ found them seldom in the anterior maxilla.

The aetiology behind odontome remains unknown.¹⁰ It has been linked to a variety of pathologies, including local injury, inflammatory and/or infectious conditions, mature ameloblasts, cell remnants from the dental lamina, hereditary anomalies (such as Gardner's syndrome, Hermanns syndrome), odontoblastic hyperactivity, and changes in the genes that regulate dental development. Odontomes are likely to form as a result of growing pressures brought on by insufficient space, which can have a variety of implications on tooth development. Odontome may arise as a result of the division of a tooth germ in an infection or may be due to obstruction in tooth development. This might have a pathogenic connection or have an impact on how genes influence tooth development.

Torreti et al¹² suggested that a large variety in clinical form and content has been observed in the tumours arising from ameloblast cells.² Complex odontoma usually cause mild to moderate bony expansion compared to compound odontomas. The preferred course of treatment is typically surgical excision of odontome, which is the impediment for tooth eruption. Since there are frequently morphological abnormalities related with the teeth, there hasn't been a consensus on the optimum strategy for managing impacted teeth associated with the lesion. Compound odontomas are typically several, tiny, calcified, radiopaque masses that resemble normal teeth anatomically. Complex odontomas,

on the other hand, are calcified radiopaque masses that are anatomically unrelated to teeth but are both encircled by a thin radiolucent rim.

In this case, we noticed multiple radiopaque structures which were suggestive of complex odontoma that caused the impaction of right central incisor and displacement of right maxillary lateral incisor. In accordance with the literature, the treatment given for complex odontoma is surgical removal and the ideal treatment of impacted tooth should permit its conservation and repositioning in the arch.^{13–15} Conversely, it was reported that frequently impacted teeth are extracted along with the odontoma.¹⁶ In the above case, the permanent central incisor could not be saved with unbefitting root dilaceration and hence it was removed along with the complex odontoma with the aim of replacing it with an implant-supported prosthesis. In order to prepare for the upcoming implant insertion, the removal of bone around the lesion was kept to a minimum.

4. Conclusion

Odontoma has a restricted growth, but its removal is indicated because it contains various tooth contents that can incline to cystic change, hinder with eruption of permanent teeth and lead to substantial destruction of bone. As odontomas are well capsulated tumour, simple surgical excision will be the treatment of choice but special care to be taken to circumvent any relapse which is perilous in immature complex odontomas. Each clinical case must be properly resolved, which requires thorough knowledge and great radiographic examination. Early detection and surgical treatment of an odontoma will improve the prognosis since an odontoma is typically divided from its neighbouring teeth by the existence of a bony septum. The excised specimen should be judiciously inspected microscopically to detect the diagnosis of odontoma.

5. Consent

For the purpose of publishing this case report and any related photos, the patient's written informed consent was obtained.

6. Source of Funding

None.

7. Conflict of Interest

None.

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