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Review Article

Complex Odontome Associated with Maxillary Impacted Deciduous Tooth- A Rare Case Report with Literature Review

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Abstract: Odontomas are hamartomatous malformation of odontogenic origin in which both epithelial and mesenchymal cells exhibit complete differentiation into enamel, dentin & cementum which are displayed in an unusual pattern. They are morphologically categorized into complex and compound forms. They usually cause interfere in the eruption of teeth and are diagnosed in routine radiographs. The purpose of this article is to report and discuss about an unusual case of complex odontome associated with maxillary incisor in a 4-year-old male child. The odontomas were removed along with the impacted incisor and on the basis of clinical and histopathological examination, a diagnosis of complex odontome was made.

Keywords: complex odontoma, deciduous dentition, management, primary tooth, unerupted.

INTRODUCTION

Odontomas are the developmental anomalies resulting from the growth of tooth forming cells such as ameloblasts and odontoblasts. These tumors consist of enamel and dentin and certain amount of pulp tissue. Paul Broca coined the term 'odontoma' in 1867 and defined it as the tumor formed by the overgrowth of dental tissue [1]. WHO defined it as "a malformation in which all the dental tissues are represented, individual tissues being mainly formed but occurring in more or less disorderly pattern" [2]. Most of the odontomas are asymptomatic, go unnoticed until some signs and symptoms such as impaction or retention of tooth or swelling can occur.

CLASSIFICATIONS

Gabell, James, and Payne, (1914) broadly divided odontome into: epithelial, composite (epithelial and mesodermal) and connective tissue [1].

Thoma and Goldman's classification (1946):

- Geminated composite odontome – two or more, more or-less well-developed teeth fused together.
- Compound composite odontome – resemble more or-less rudimentary teeth.
- Complex composite odontome – calcified structure, which has no similarity to the normal anatomy of dental tissues.
- Dilated odontome – marked enlargement of the crown or root part of tooth.
- Cystic odontome – an odontome that is normally encapsulated by fibrous connective tissue cyst.

World Health Organization classification (WHO, 2005): Complex odontomas, compound odontomas & ameloblastic fibro-odontoma [1].

Compound odontomas are further classified morphologically as denticular, particulate and denticuloparticulate. Denticular type has two or more separate denticles, which resembles the tooth. Particulate type has masses of particles that does not resemble the tooth and the third type has both denticles and particles side by side [3].

Odontomas are asymptomatic lesions often lead to alterations in permanent or primary tooth eruption. The diagnosis of odontoma is usually established on routine radiographic examinations (panoramic and/or intraoral radiographs), or on evaluation of the cause of delayed tooth eruption. The treatment of choice is surgical removal of odontome in all cases, followed by histopathological study to confirm the diagnosis [1].

Developmental stages of odontome based on radiological findings:

- The first stage is characterized by radiolucency due to the absence of tissue calcification,
- The second or intermediate stage presents with partial calcification of dental tissue,
- The third or classically radiopaque stage exhibits predominant tissue calcification surrounded by radiotransparent halo. Radiographic identification of odontoma is possible at this stage [4].

Etiology

The exact etiology of odontome is unknown. However, it has been suggested that trauma and infection may lead to the development of such a lesion and hereditary anomalies (Gardner's syndrome, Herman syndrome and basal cell naevus syndrome) [5]. According to Hitchin, odontomes are inherited or are due to a mutagene or interference, possibly postnatal, with the genetic control of tooth development [6]. Philipsen et al., put forth the hypothesis that formation of a compound odontome is pathogenically same as the process producing hyperdontia, 'multiple schizodontia' or hyperactivity of dental lamina [7].Torreti et al considers mature ameloblasts as culprits for odontomes as these have potential of developing tumors with a wide variation in appearance and content. Whereas Feijerskov suggests cell rests of serres as causative agent. These cells proliferate to form odontomes wherein the degenerated cells form cystic lining around the tooth indicating genetic defect [6].

Our case reports complex odontoma associated with impacted tooth in the maxillary anterior region on the left side which is rarest in primary teeth.

CASE DESCRIPTION

A 4-year-old male patient reported to the OPD, Dept. of Pedodontics with a chief complaint of missing tooth and swelling i.r.t. upper left front tooth region. The parents noticed swelling by around 9 months of age and there was no increase in size reported. The swelling was not associated with pain or discharge. No history of trauma reported. Extraoral examination showed no abnormality. The clinical picture reveals the missing tooth i.r.t 61 and a well-defined swelling on labial aspect of 61, measuring about 1cm*0.5cm extending mesiodistally from labial frenum up to mesial aspect of 62. Superio-inferiorly it extended approximately 2mm above the alveolar ridge upto the vestibular depth. No secondary change was seen over the swelling. No inflammation of marginal gingiva and interdental papilla was present (fig-1).

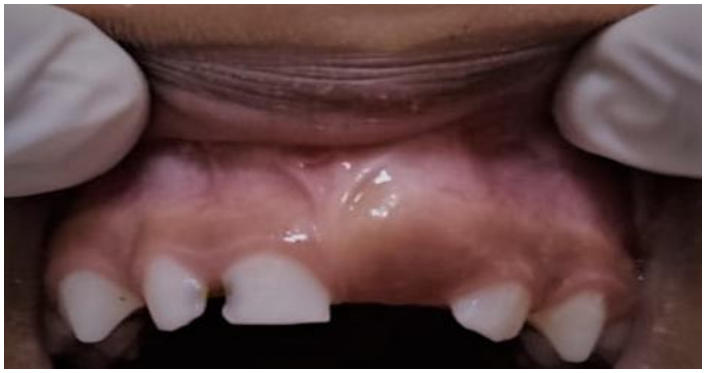

Fig-1: Intraoral photograph showing bulge and missing tooth i.r.t 61

On palpation, swelling was bony hard in consistency, non-tender, well- defined, fixed to the underlying tissue and was not mobile. Palatal aspect i.r.t 52,51,61,62 was normal. No regional lymphadenopathy, no anesthesia or paresthesia over the distribution of anterior and middle superior alveolar nerve observed. On the basis of clinical examination, a provisional diagnosis of odontoma was made.

The differential diagnosis includes super numerary tooth, dens evaginatus/ dens invaginatus, adenomatoid odontogenic tumor, ameloblastic fibro odontoma, osteoma, eruption cyst, and nasolabial cyst.

Radiographic examination

OPG, IOPAR, RVG and occlusal radiographs were taken (fig-2) and revealed impacted 61 and two discrete radiopaque structures i.r.t 61 with enamel and dentin indicative of odontomas.

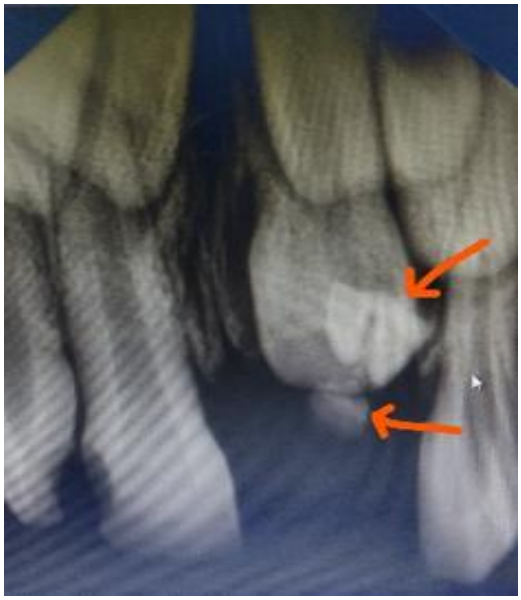

Fig-2: RVG revealing tooth-like structures

The surgical excision of odontomas along with 61 was done after blood investigations. The consent was obtained from the parents. After application of local anesthetic, a crevicular incision was given, i.r.t labial aspect of 61 followed by an oblique releasing incision distally and mucoperiosteal flap was elevated towards the labial aspect of maxilla, which revealed the odontomas. Periosteal bone was removed using bone rounger and the two odontomas were removed along with the 61 (fig-3). Sharp bony margins were rounded off, the area was irrigated with povidone-iodine solution and sutures were given (fig-4).

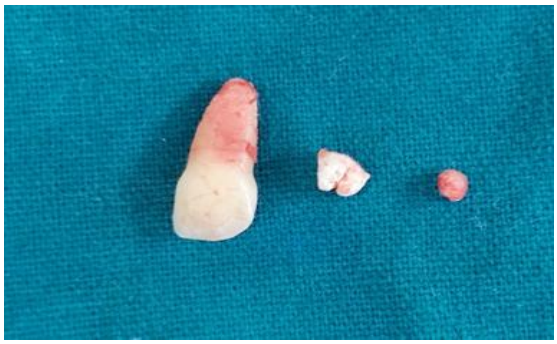

Fig-3: Extracted odontomas and 61

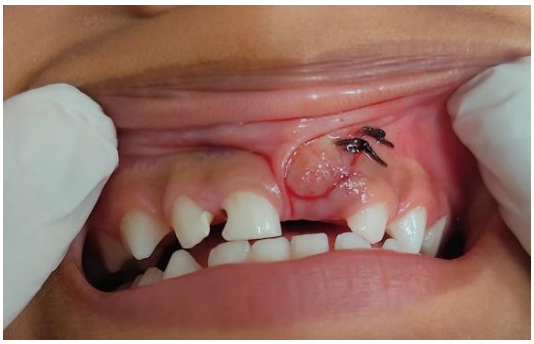

Fig-4: Immediate post-operative photograph.

The specimen was sent for histopathological evaluation. It revealed the presence of irregular mature tubular dentin enclosing clefts and hollow circular spaces that contained enamel that was lost with decalcification. A thin layer of cementum surrounding the cleft like spaces can be seen. Correlating with the clinical, radiographical and the histopathological features a diagnosis of COMPLEX COMPOSITE ODONTOME was made. Three weeks follow-up showed satisfactory healing of the operation site. (Fig-5a, 5b).

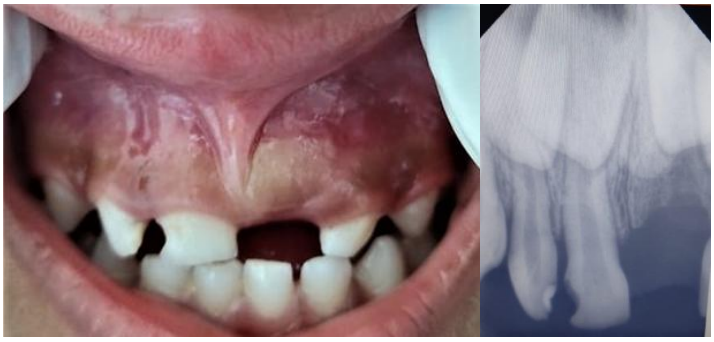

Fig-5a, 5b: Follow-up after 3 weeks

DISCUSSION

The term odontome by definition alone refers to a tumour of dental origin. They are asymptomatic, benign, slow growing and non-aggressive in nature. Since the odontogenic cells fail to reach normal state of morpho differentiation, the enamel and dentin are usually laid down into an abnormal pattern [6]. Odontomas are more commonly associated with permanent dentition rather than with the primary teeth which is rarely affected.

Junquera et al classified odontomas clinically as central (intraosseous) odontoma, peripheral (extraosseous or soft tissue) odontoma, and erupted odontoma [8]. Compound odontomas seldom cause bony expansion and are thus remain unnoticeable, but complex odontomas often cause slight or marked bony expansion. Radiographically, in the compound type, crudely formed teeth of varying size and shape may be observed in the radiolucency. In the complex type, the radiopacity does not have a specific shape but appears as a disorganized irregular mass [9]. The occurrence of complex odontomas to composite variety is in the ratio 1:2. Most of the odontomas found in the anterior segment of the maxilla are compound composite (61%), whereas the majority in the mandibular posterior segment is complex composite in type (34%). Interestingly, both type of odontomas are more frequently occur on the right side of the jaw than on the left [10].

Sometime odontomas do erupt but they are distinct to the usual tooth pattern as they lack periodontal ligament and root formation. They increase in size, cause sequestration of the overlying bone this leads to pressure and movement in occlusal direction. Bone remodelling is also considered as a possibility for its eruption [6].

Impaction of the primary teeth is extremely rare. Factors contributing to tooth impaction include developmental anomalies like malposition of tooth inside the alveolar bone, dilaceration of crown or root, ankylosis, any associated tumours or odontoma, dentigerous cysts, presence of supernumerary teeth on the path of eruption and systemic/genetic interrelation such as cleidocranial dysostosis and hypopituitarism. Impaction of an anterior deciduous tooth is very rare. When it occurs, it is most often associated with the presence of a supernumerary tooth or odontoma [11]. According to a study done by Philipsen et al [12] based on 139 complex odontomas (Philipsen, Reichart and Praetorius, 1997) the average age at which complex odontomas are discovered is by around 19.9 years and the male/female ratio of compound odontomas varies from 1.2:1 to 1:1 and the ratio of complex odontomas varies from 1.6:1 to 1:0.8.

The presence of odontogenic tumors may hamper the eruption of the succedaneous/ associated tooth. Other complications include: malocclusion, esthetic- disfigurement, psychological trauma and in severe cases, infection or lymphadenopathy. Occasionally odontomas are reported to be a cause for delayed eruption in primary and permanent dentition [13].

The management of odontome in both primary and permanent dentition is always surgical excision and follow-up at regular intervals. If odontome are extirpated early without disturbing the underlying tooth germ, the eruption of the impacted teeth can then be expected spontaneously or after orthodontic traction. However, underlying impacted teeth are sometimes extracted in association with the removal of odontomas [14]. If the root of the impacted tooth is still developing, the tooth may erupt normally; but, once the root apex has closed, the tooth can loose its potential to erupt [15]. In our case, considering the age of the patient, we extracted the impacted tooth since the chances of physiological tooth eruption is very rare and the parents are not interested in further orthodontic traction treatment for getting the tooth into proper dental alignment in the arch.

CONCLUSION

Odontomas are benign tumours frequently seen in oral cavity of people in all ages that sometimes produce no symptoms and constitute casual findings of routine radiological studies. If no signs or symptoms appear, and therefore

the lesions go undetected, they can remain within bone for several years without producing clinical manifestations. Since odontomas represent an outsized proportion of jaw tumors, adequate knowledge of their characteristics is important for the establishment of proper diagnosis and management especially when patient complaints of unerupted tooth.

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