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Diastema-The Treatment Dilemma

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Spacing between adjacent teeth is known as Diastema, many of the patients seek closure of diastema for aesthetic reasons. Diastema less than 2 mm close spontaneously, if they do not do so then they should not be straightaway corrected rather a thorough clinical and radiographic examination should be done to determine the underlying cause and to rule out anomalies, such as the presence of any supernumerary tooth or odontoma's which should be ruled out before going on for orthodontic therapy. The purpose of this article is to present and discuss the case of a 9-year-old child with the chief complaint of spacing between the maxillary right permanent central incisor and right permanent lateral incisor. Radioopaque calcified masses were seen in the radiograph and was diagnosed with compound odontome followed by the surgical removal of the calcified masses.

KEYWORDS: Odontome, Compound Odontome, Spacing

INTRODUCTION

Odontomes are considered as the developmental anomalies resulting from the growth of completely differentiated epithelial and mesenchymal cells that give rise to ameloblast and odontoblast and are hamartomatous malformation rather than true neoplasm and are generally asymptomatic.¹ These tumors are usually formed of enamel and dentin, but they can also have variable amount of cementum and pulp tissue. The term 'odontoma' was coined by Paul Broca in 1867.² Broca defined the term as tumors formed by the overgrowth or transitory of complete dental tissue. These generally consist of unerupted or impacted teeth, retained deciduous teeth, swelling, and evidence of infection. The most common location for impacted teeth associated with odontomes is the anterior maxilla.^{3,4}

Odontomas constitute about 22% of all odontogenic tumors of the jaws. Almost, 10% of all odontogenic tumors of the jaws are compound odontomas.⁵ The incidence of compound odontome ranges between 9 and 37% and the complex odontome is between 5 and 30%.^{3,6} The compound odontoma is more common than the complex odontoma which in turn is more common than the ameloblastic odontoma. The majority of odontomas that are found in anterior segment of the jaws are compound composite in type (61%), while the majority in the posterior segment is complex composite in type (34%). It has been seen that both type of odontomas occurred more frequently on the right side of the jaw than on the left, (compound 62%, complex 68%). The compound composite

odontome most frequently occurred in incisor cuspid region of the upper jaw in comparison to the complex odontome which were commonly found in molar and premolar region of the mandible.⁶

This paper discusses a case of 9 years old boy with compound odontome. The radiograph revealed calcified masses and the case was diagnosed with the compound odontome and was surgically excised.

CASE REPORT

A 9-year-old male patient reported with a complaint of spacing in the upper front region of the jaw (Figure 1 & 2). Past family and medical histories were not relevant. The medical history was non-contributory. Intraoral examination revealed a spacing between right maxillary permanent central incisor and permanent lateral incisor.



Figure 1. Showing Spacing Between Permanent Maxillary Central Incisor and Permanent Lateral Incisor



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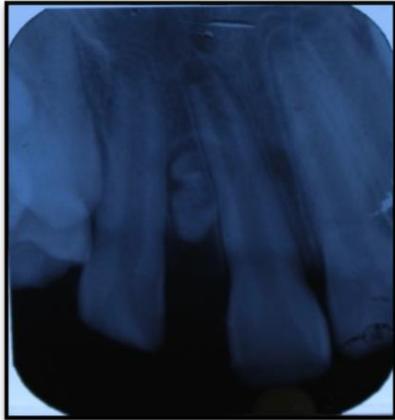


Figure 2. Intraoral Periapical Radiograph Showing Multilocular Radiolucency

INVESTIGATIONS

1. Intraoral periapical radiograph
2. Blood investigations

The patient was subjected to surgical removal of the odontome under local anesthesia. Partial thickness of mucoperiosteal flap was reflected from the labial surface of right maxillary permanent central incisor to the mesial of the right maxillary permanent canine. The layer of bone overlying the mass was removed and all the calcified masses were exposed (Figure 3). The irregular five calcified masses were removed (Figure 4). Curettage was done and the area was irrigated with Povidine iodine solution and normal saline (0.9%). The flap was repositioned and sutured. Patient was put under antibiotic and analgesics for 3 days. Patient was recalled after 1 week for suture removal. Diagnosis was made as compound odontome because there was conglomeration of small structures resembling teeth and the samples were subjected for the histopathological evaluation.



Figure 3. Surgical Exposure



Figure 4. Removal of Calcified Masses

HISTOPATHOLOGICAL FEATURES

- Microscopic section (H&E stained) exhibiting an irregular arrangement of dentin (i.e. more tubular dentin was present)
- The mesenchymal tissue was resembling to that of pulp
- A thin layer of cementum was present at the periphery of the mass.

DISCUSSION

Diastema has a racial and familial background but in literature various reasons have been attributed to it such as supernumerary teeth, odontomas, hypertrophic labial frenum, Ellis-van Creveld syndrome, Pai Syndrome, cleft palate and median cyst, all these anomalies should be ruled out before going to any intervention therapy. So, in the present case report the chief complaint of the patient was spacing between the teeth but after carrying out the further investigation final diagnosis was made as odontomes which were surgically removed before going any orthodontic intervention. The term odontome by definition refers to a tumor of odontogenic origin. In a broad sense, it means a growth with both the epithelial and mesenchymal components exhibiting complete differentiation with the result that functional ameloblast and odontoblast form enamel and dentin. This enamel and dentin were usually laid down in an abnormal pattern because the organization of odontogenic cells failed to reach the normal state of morphodifferentiation.

Some reports have reported presence of both the types of odontomes in different locations, such as maxillary sinus, according to Bland Sutton (1988) in which 300 denticles were seen bilaterally, mandibular ramus, subcondylar region or mental foramen, mid palate and the middle ear. Hermann (1957) presented a case of

compound composite odontome which consisted of 2,000 denticles. The association of odontomes with the deciduous dentition is rare. Tratman (1949) thought that the deciduous dentition was not prone to the formation of odontomes while Saeed and Khalid noted presence of multiple odontomas in both maxilla and mandible in a female aged 7 years. In the review done by Katz, only (2%) of 396 odontomas were associated with failure of a primary tooth eruption.⁶

WHO CLASSIFICATION OF ODONTOMES

1. Complex odontoma: When the calcified dental tissues are simply arranged in an irregular mass bearing no morphologic similarity to rudimentary teeth.
2. Compound odontoma: Composed of all odontogenic tissues in an orderly pattern that results in many teeth-like structures, but without morphologic resemblance to normal teeth.
3. Ameloblastic fibro-odontome: Consists of varying amounts of calcified dental tissue and dental papilla like tissue, the later component resembling an ameloblastic fibroma. The ameloblastic fibro-odontome is considered as an immature precursor of complex odontome.⁷

In 1914, Gabell, James and Payne grouped odontoma on the basis of their developmental origin, into three types:

- a. Epithelial
- b. Composite (epithelial and mesodermal)
- c. Connective tissue

According to their position within the jaws:

- a. Intraosseous (erupted odontoma): They occur inside the bone and may erupt into the oral cavity. To date, 12 cases of the erupted variety have been described in the literature.
- b. Extraosseous or peripheral odontomas: These are odontomas occurring in the soft tissue covering the tooth bearing portions of the jaws, having a tendency to exfoliate.^{8,9}

According to Thoma and Goldman (1946)

- a. Germinated composite odontomes: Two or more, more or less well-developed teeth fused together.
- b. Compound composite odontomes: Made up of more or less rudimentary teeth.
- c. Complex composite odontomes: Calcified structure, which bears no great resemblance to the normal anatomical arrangement of dental tissues.

d. Dilated odontomes: The crown or root part of tooth shows marked enlargement.

e. Cystic Odontomes: An odontome that is normally encapsulated by fibrous connective.^{10,11}

The etiology of odontome is from extraneous odontogenic epithelial cells, these buds get divided into several particles, they develop individually to become numerous malformed closely positioned teeth or tooth-like structures pertaining to that of the pulp tissue in the central portion which is surrounded by dentin shells and are partially covered by enamel components. Complex odontomas are conglomerated masses without the normal organization of dentin, enamel, enamel matrix, cementum, and areas of pulp tissue.^{12,13} Odontoma is surrounded by the connective tissue capsule that is similar to the follicle that covers a normal tooth and is commonly present closely associated to adjacent teeth, but are separated by septum of bone. The conservative surgical removal of compound odontomas has remained the treatment of choice.^{13,14}

CONCLUSION

The diagnosis of odontomas cannot be made by visual or manual techniques. It has to be done in coordination with radiographic as well as histological examination. Radiographic examination of all pediatric patients that present clinical evidence of delayed permanent tooth eruption or temporary tooth displacement, with or without history of previous dental trauma should be performed. Early diagnosis of odontomes allows adoption of a less complex and less expensive treatment and ensures normal eruption pattern of permanent teeth.

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