Compound Odontoma Associated with Impacted Teeth: A Case Report

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INTRODUCTION

Variation in the normal eruption of teeth is a common finding, but significant deviations from normal should alert the clinician to investigate further. It is suggested that an individualized radiographic examination should be performed for patients who present with clinical evidence of delayed permanent tooth eruption or temporary tooth displacement or retained deciduous teeth with or without a history of previous dental trauma. This will help the clinician rule out pathologies like odontoma. The odontoma, a mixed odontogenic tumor emulating all the hard tissues products of a mature tooth germ, is almost certainly the most common type of odontogenic tumor or hamartomas.¹ WHO 2005, has classified two types as; complex and compound odontomes, occurring in the ratio of 1:2.² The majority of compound odontoma cases (74.3%), are diagnosed before the age of 20 years,³ during routine radiographic examination, occurring commonly in the anterior maxillary region. Thus, early diagnosis will facilitate the clinician to adopt a simpler and less complex approach of treatment for a better prognosis. In spite of the low frequency and good prognosis, there must be a close follow-up of such lesions, because these lesions are reported to be associated with conditions such as ameloblastoma, adenomatoid tumor, and carcinoma.

CASE REPORT

An 11-year-old boy came to the department with the chief complaint of non-eruption of the upper right front tooth. Patient was asymptomatic, and his past dental and medical history was not significant. Intraoral examination revealed that 11, 12, and 13 had not erupted into the oral cavity, but 21, 22, and 23 were present (Figure 1). There was no sign of inflammation, pain or infection and surrounding mucosa was normal. An intraoral periapical radiograph revealed presence of 11 deep in alveolar bone. The crown of the unerupted 11 was overlapped by tooth like masses (Figure 2). Intraoral periapical radiograph showed a collection of tooth-like structures with a narrow radiolucent rim around. The orthopantomograph showed multiple radio-opaque teeth-like structures in relation to unerupted maxillary right central incisor surrounded by a radiolucent band with smooth outer periphery.

Keywords: Compound odontoma, Delayed tooth eruption, Maxilla, Odontogenic tumors, Odontoma

Figure 1: Eruption bulge with missing permanent teeth
Choudhary, et al.: Compound odontoma associated with impacted teeth

DISCUSSION

Odontomas are most common variety of mixed odontogenic tumors, in which enamel and dentin are formed when both the epithelial and mesenchymal components undergo functional differentiation. The abnormal pattern of enamel and dentin are laid down because the organization of the odontogenic cells fails to reach a normal state of morphodifferentiation. They are hamartomatous lesions rather than true neoplasms.

The term “odontoma” was coined by Paul Broca in 1867. Its incidence has been reported to be as 22-67% of all odontogenic maxillary neoplasms. Frequently impacted by odontomas are canines, followed by upper central incisors and third molars, there are with few cases being related to missing teeth. These tumors can be found anywhere in the dental arches and are generally intra-osseous. However, they may erupt into the oral cavity occasionally. They may occur at any age and in any gender; however, most cases are detected in the first two decades of life on routine radiographs. The neighboring teeth may be affected in

(Figure 3). The clinical-radiological findings are suggestive of compound odontoma. Surgery was performed to remove the lesions and three mineralized structures showing a tooth-like appearance were found within them (Figure 4). The specimen was sent for histopathological examination. The H and E stained decalcified section showed admixture of dentinal tissues arranged in a haphazard manner with serrated borders (Figure 5) confirming the clinical-radiographic diagnosis of complex odontoma. The healing was uneventful, and no post-operative complications were noted. The crown of 11 was clinically visible after 1 month of follow-up (Figure 6). The patient was followed for 1 year however there was no recurrence.

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70% cases by pathologic changes such as, malformation, malposition, devitalization, aplasia, and delayed eruption. They may also undergo cystic transformation.

1914 Gabell et al. gave the first classification according to the developmental origin as epithelial, composite (epithelial and mesodermal) and connective tissue.9,10 Later in 1946 Thoma and Goldman classified them as:

- Gminated composite odontomes-two or more well-developed teeth fused together
- Compound composite odontomes-consists of more or less rudimentary teeth
- Complex composite odontomes-are calcified structure that has no great resemblance to the normal anatomical arrangement of dental tissues
- Dialated odontomes-there is marked enlargement of the crown or root part of the tooth
- Cystic odontomes-is normally encapsulated by fibrous connective tissue in a cyst or in a wall of cyst.5,11

Then WHO in 19927 based on the degree of morphologic differentiation classified odontomes as compound odontoma with at least superficial anatomic resemblance to teeth as all the dental tissues are represented in an orderly fashion. While in a complex odontoma there is little or no morphologic resemblance to normal tooth formation. They have also been classified clinically as:

- Intra-osseous (central)-they occur within the bone and may erupt into the oral cavity and represents 51% of all odontogenic tumors. Occurs predominantly in the anterior maxilla and mandibular molar areas
- Extra osseous (peripheral)-they occur in the soft tissue covering the tooth bearing areas of the jaws12
- Rarely, intra-osseous odontomas may facilitate their eruption into the oral cavity when located coronally to an impacted or erupting tooth or superficially in bone. Here they are referred to as erupted odontomas.12

Majority of compound odontomas are located in the anterior region of the maxilla and diagnosis is frequently made on the basis of the failure of a permanent tooth to erupt as in the present case. In 40-50% of cases, an impacted permanent tooth is associated with the compound odontoma.10 Complex odontomes are located in the mandible especially in the posterior areas. The compound odontoma is a malformation in which all the dental tissues are in a more orderly pattern so that the lesion consists of many tooth-like structures. They appear twice more frequently than complex odontomas.4 They are usually asymptomatic, have slow growth, and seldom exceed the size of a tooth, but can cause expansion of the cortical bone when grows large in size. Based on the data of the survey by Philipson et al. the relative frequency of the compound odontoma is 9-37% of all odontogenic tumors. The average age at diagnosis is 17.2 years (range 0.5-73 years).10 75% of all case are diagnosed at around age 20 years, and it is slightly more common in males as compared to female (1.2:1).

Local trauma and infection at the place of the lesion can offer ideal conditions for its appearance. However, genetic predisposition by inheritance, mutant gene or interference has also been suggested. Lamellar odontoma arise from an exuberant proliferation of the dental lamina or its remnants or can be a result of multiple schizodontia, i.e. a locally accustomed hyperactivity of dental lamina.13 It may also be associated with the Gardner’s syndrome of intestinal polyposis or the rare odontoma dysphagia syndrome.14 Primary dentition if traumatized (intrusion and avulsion) during the developmental stages of a succedaneous permanent tooth interferes with its future growth due to the close relationship between the apices of primary teeth and the buds of permanent teeth.15

Differential diagnosis includes ameloblastic fibroodontoma, ameloblastic fibroma and odontoameloblastoma. The lesions may also occur as part of few conditions, such as Gardner syndrome, basal cell nevus syndrome, familial colonic adenomatosis, tangier disease, or Hermann syndrome.6

Radiographically odontomas have characteristic features which depend on their stage of development and degree of mineralization.

- First stage: A radiolucency due to lack of calcification
- Intermediate stage: Partial calcification is observed
- Third stage: The lesion usually appears as radiopaque masses surrounded by radiolucent areas corresponding to the connective tissue histologically.16

The lesions of compound odontoma are usually unilocular and frequently appears as a collection of numerous radiopaque, miniature tooth-like structures known as denticles.17 Composite odontoma appears as a calcified mass with a radiodensity similar to tooth structure; both are further surrounded by a narrow radiolucent zone.

Histopathologically, odontomas are composed essentially of mature dental tissues that is enamel, dentin, cementum, and pulp tissue and may be arranged in discrete tooth-like structures (compound odontoma) or as unstructured sheets (complex odontoma). The bulk of the tumor usually consists of normal appearing dentin with a fibrous capsule and a supporting fibrous tissue in a small amount.4 As odontomas include epithelial and mesenchymal tissue they can undergo cystic degeneration of the enamel organ after partial or total development of the crown, and can transform into dentigerous cyst. The cystic transformation of the follicle associated with the unerupted tooth may also occur when its eruption is impeded by the odontoma.4
Ghost cell keratinization is occasionally seen in the enamel-forming cells of some odontomas. Surrounding hard tissue calcification leads to reduced oxygen supply by walling-off effect which in turn causes metaplastic transformation of odontogenic epithelium leading to cell death and keratinization. This pathogenesis was later ruled out, and many other concepts were put forth in due time.

Treatment of choice comprises surgical extraction, along with any associated soft tissues, fenestration, orthodontic traction or periodic simple watching along with clinical and radiographic examination to appraise the path of eruption of teeth. Recurrences are rare.

CONCLUSION

Odontomas are more commonly associated with impacted teeth and rarely erupt into the oral cavity. Even though these lesions are benign in nature, they can give rise to inflammation, pain and infection when they erupt in the mouth. Early detection and treatment of odontomas could increase the possibility of preservation of the impacted teeth. The treatment of choice is surgical removal of the odontoma, followed by histological analysis. As was demonstrated by this report, early diagnosis of odontomas on a routine radiographic examination allows adoption of a less complex and less expensive treatment and ensures better prognosis.

REFERENCES


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