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Odontoma –A Review.

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ABSTRACT

Odontomas are the most common benign odontogenic tumors of the jaws. They are slow growing and nonaggressive, but sometimes they cause pain, swelling, expansion of bone and interfere with the eruption of the associated tooth. The aim of this paper is to present a thorough review on the etiology, clinical presentation, radiological appearance, microscopic evaluation and treatment aspects of odontomas.

Keywords: Hamartomas, odontoma, Odontogenic tumors, swelling

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INTRODUCTION

Odontomas are considered as most common odontogenic tumors of jaw [1]. They are slow growing, non aggressive and composed of enamel, dentin, cementum and occasionally pulp tissue. Broca in 1867 first coined the term “Odontoma” and defined it as “tumors formed by the overgrowth of transitory or complete dental tissues”[2,3]. Based upon gross and radiographic features odontomas are classified as compound odontoma and complex odontoma. Compound odontomas are more frequent compared to complex odontomas.

During development of compound odontoma, enamel and dentin is deposited in such a way that the resulting structures show an anatomic resemblance to normal teeth; whereas in complex odontome dental tissues form an irregular mass in a disorganised fashion [4].

Classification system

In 1946, Thoma and Goldman classified odontomas as geminated composite odontomes, compound composite odontomes, complex composite odontomes, dilated odontomes and cystic odontomes [2]. As per their description, geminated composite odontomes are formed due to fusion of two or more, less or well developed teeth; compound composite odontomes are made up of more or less rudimentary teeth and Complex composite odontomes are calcified structure bearing no great resemblance to the normal anatomical arrangement of tooth. They described Cystic odontomes as an odontome that is normally encapsulated by fibrous connective tissue in a cyst or in the wall of a cyst and Dilated odontomes as a structure whose crown or root part of tooth shows marked enlargement. The second edition of the WHO Histologic Typing of odontogenic tumors listed odontomas as complex odontoma, compound odontoma and odontoameloblastoma. According to WHO classification of odontogenic tumours (2005), there are two types of odontomas; Compound and complex odontoma [1]. Few authors have reported a new type of odontome, known as hybrid odontome [2].

Complex and compound odontoma:

Compound odontomas are considered as the commonest odontogenic malformation, frequency of which varies between 9% and 37% among odontogenic tumors. Majority of them appears before 20 years. On the other hand frequency of complex odontomas varies between 5% and 30%. Majority of them appears before 30 years. Compound odontomas are more prevalent in maxillary anterior region, whereas Posterior mandibular followed by anterior maxilla is the most frequent sites for complex odontome. [4,5,6]

Etiopathogenesis and eruptive potential

The exact etiology of odontoma is unknown but various authors suggested local trauma, infection, growth pressure, hereditary and developmental influences as possible causes. The mechanism underlying the eruption of erupted odontome differs from normal

tooth eruption as they lack periodontal ligament and root [7,8]. The eruption of odontoma is not related to contractility of fibroblasts. Their increasing size causes sequestration of overlying bone, hence eruption takes place [7,8].

Odontomas can be associated with Gardner's syndrome as well as Hermann's syndrome [9]. Dentigerous cyst can be developed from odontome due to its odontogenic nature. This cyst commonly results from the cystic degeneration of enamel organ after partial or total development of the crown. Cystic transformation of the follicle associated with the unerupted tooth may also occur when its eruption is hindered by the odontoma [10,11].

Clinical and radiographical presentation

Depending upon clinical presentation odontomas are classified as central odontoma, peripheral odontoma and erupted odontoma. Central odontomas are present within the bone and peripheral odontomas occur in soft tissue which covers the tooth bearing portion of jaw. Most of the odontomas appear as asymptomatic mass with minimal growth potential. Rarely do they exceed the size of a tooth, but when large they can cause expansion of cortical bone, swelling, pain and other related symptoms. Few cases with infection and lymphadenopathy have also been noted.

The radiographic picture of odontomas is diagnostic. They appear as radio-opaque structures surrounded by a radiolucent halo. The radiolucent halo represents an enlarged follicle. In radiograph, compound odontomas appear as multiple teeth like structures of varying size and shape whereas irregular radio dense masses represent complex odontomas. Depending upon the degree of calcification, radiographically three different development stages can be identified [1,6,7,12-16]. In the preliminary stage due to the lack of calcification odontomas appear as radiolucent, intermediate stage is characterized by partial calcification; whereas at the end stage odontomas appear as radio-opaque structures surrounded by a radiolucent halo. The degree of calcification of odontoma in the primary dentition is less compared to permanent dentition.

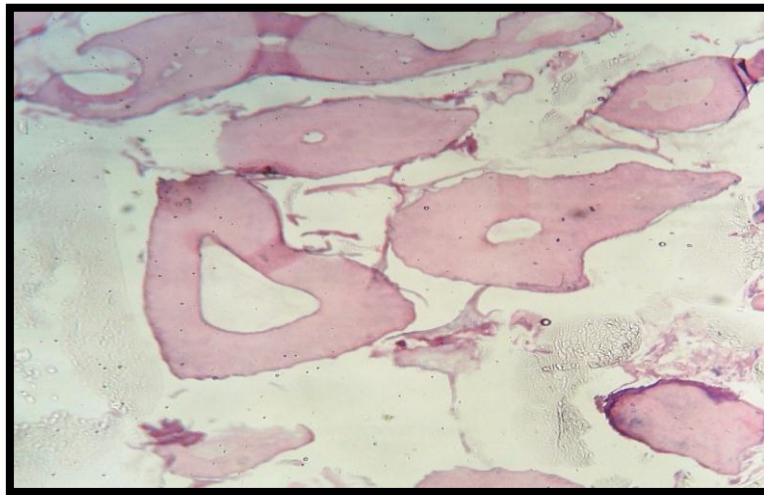
This clinical and radiographic presentation of odontoma should be differentiated from osteoid osteoma, cementoblastoma and ossifying fibroma [7]. Osteoid osteomas appear as a small ovoid or round radiolucent area that is surrounded by a rim of sclerotic bone with some calcification in central radiolucent area. Cementoblastoma radiographically appears as a well defined radiopaque mass which is attached to the end of the tooth root and surrounded by a radiolucent rim. Ossifying fibroma presents as a well-defined radiolucent area with increasing internal radiopacity as it matures. Ultimately the lesion appears as uniform radiopaque mass. Despite the developmental stage the lesion is always well circumscribed [5-7]. None of them are associated with impacted tooth.

Among few reports, Lakshmi Kavitha et al in 2011 reported the Computed Tomography (CT) imaging characteristics of complex odontomas. As per their report, in addition to OPG, use of CT was valuable to visualize the relationship of the unerupted third molar and an odontoma in the sagittal plane [9]. Kannan et al in 2013 mentioned that the use of advanced diagnostic aids such as CBCT (Cone Beam Computed Tomography) helps in

more efficient treatment planning for atraumatic excision of odontome compared to conventional radiographic methods [17].

Histopathological aspect and treatment plan

The histopathological examination of odontomas is mandatory to establish a definitive diagnosis. Under microscope, odontoma show varying amount of dentin, pulp tissue, enamel organ and cementum. Odontogenic epithelium, odontoblasts and mesenchymal pulp tissue may be present in few cases. The connective tissue capsule present in odontoma is similar to that of dental follicle. Along with spherical dystrophic calcification ghosts cells are often seen. Histopathologically Compound odontomas resemble tooth-like structures which comprise pulp tissue in the central portion surrounded by dentin and sometime partially covered by enamel like substances. On the other hand, Complex odontomas represents conglomerates of dentin, enamel matrix, cementum and areas of pulp tissue without proper orientation.



Histopathological Photomicrograph-Complex odontome

Odontomas are treated by conservative surgical excision. Along with removal of odontoma, surgical excision of surrounding soft tissue is recommended to eliminate the possibility of its cystic degeneration [1,6,7,12-16]. The lesion does not show any recurrence.

CONCLUSION

Odontomas represent as most common odontogenic jaw tumors. They may create diagnostic problem during clinical examination as well as radio graphical interpretation. Adequate knowledge of their presentation is necessary to establish proper diagnosis. Early diagnosis and surgical enucleation of odontoma followed by curettage is recommended to prevent complications associated with it.

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