Asymptomatic Radiopacity in the Ramus of the Mandible: A Case Report

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Date of Acceptance : 05/Mar/2013
Date of Receiving : 21/Jan/2013

Abstract: Odontomas are the most common odontogenic tumours. They are composed of all the structures that form dental tissues. In general they are asymptomatic, have slow growth, and seldom exceed the size of a tooth, but when large can cause expansion of the cortical bone. They are usually detected in the second decade of life and are often discovered on routine radiographic examinations. The treatment for this condition is surgical, although some authors recommend follow up and once the tumor is removed it shouldn't recur. Here we present a case report of 40 year old female patient with asymptomatic radiopaque mass in the ramus of the mandible which was found accidentally during the investigation of the adjacent teeth.

Key words: Odontomas, Odontogenic Tumor, Compound Odontome, Complex Odontome.

INTRODUCTION

Odontomas are mixed odontogenic tumours in which both the epithelial and mesenchymal components undergo functional differentiation and form enamel and dentin. They are slow-growing, benign tumours showing nonaggressive behavior. The term “odontoma” was coined by Paul Broca in 1867. Broca defined the term as tumors formed by the overgrowth or transitory of complete dental tissue. However, owing to their composition and behavior, odontomas have become known as hamartomatous lesions or malformations rather than true neoplasms; the epithelial and the ectomesenchymal tissues along with their respective cells may appear normal, but they seem to have a deficit in the structural arrangement.

WHO classifies odontomas into: compound and complex. Odontomas are also classified as intraosseous and extraosseous. The compound odontoma is a malformation in which all the dental tissues are in a more orderly pattern than in the complex odontoma so that the lesion consists of many tooth-like structures. In each tooth-like structure, enamel, dentin, cementum and pulp are arranged as in the normal tooth. However, when the dental tissues form a simple irregular mass occurring in a disorderly pattern, it is described as a complex odontoma. Compound odontomas appear more frequently than complex odontomas.

These odontogenic tumors can be found anywhere in the dental arches. The majority of odontomas which are located in the anterior region of the maxilla are compound, while the great majority of odontomas located in the posterior areas, especially in the mandible, are complex odontomas.

CASE REPORT

A 40-year old female patient reported to the Department of Oral Medicine and Radiology with the chief complaint of pain and swelling in the right lower back tooth region since 15 days. The patient was asymptomatic 15 days back after which he noticed a small swelling. The patient's medical and family history was unremarkable and there was no history of trauma. Patient gives history of removal of tooth in the same region 5 years back. Clinically, facial asymmetry was apparent with a solitary diffuse swelling on the right side of mandible. On palpation it was firm, tender and the overlying skin was normal. It was also associated with rise in temperature.

Intraoral examination of the region revealed absence of right mandibular 2nd premolar and 1st molar with generalized attrition and grossly carious teeth w.r.t 26, 28, 35 and 44. (Fig. 1) On percussion, tenderness was present w.r.t 26, 28, 35 and 44. Generalised grade I stains and calculus were also present. Considering the history and the clinical examination, a provisional diagnosis of chronic apical periodontitis was made.

An intraoral periapical radiograph revealed a solitary radiopaque structure in the right mandibular 1st molar region. It was surrounded by a well-circumscribed radiolucent zone. (Fig. 2) To confirm the lesion further panoramic view was taken, which showed a dense, rounded radiopaque mass similar in density to calcified dental tissues, about 1.5 × 1.2 cm, mesial to the right mandibular second molar. The lesion was surrounded by the well-defined radiolucent halo. (Fig. 3)

Considering the radiographic presentations, a radiographic diagnosis of complex odontoma was determined. The lesion was excised and the specimen was sent for histopathologic examination. The histopathologic report confirmed the diagnosis of complex odontoma.

DISCUSSION

Odontoma is the most common type of odontogenic tumour, although some authors prefer to refer to it as hamartoma, not a true tumour. The absolute incidence of odontogenic tumours varies from 0.002% to 0.1% out of which odontomas...
constitute about 22% of all odontogenic tumours of the jaw. The etiology of odontomas is unknown. Several theories have been proposed, including local trauma, infection, family history, and genetic mutation. It may also be associated with the Gardner’s syndrome of intestinal polyposis and the rare odontomadysphagia syndrome.11,12

Hitchin suggested that odontomas are inherited through a mutant gene or interference, possibly postnatal, with genetic control of tooth development. In humans, there is a tendency for the lamina between the tooth germs to disintegrate into clumps of cells. The persistence of a portion of lamina may be an important factor in the etiology of complex or compound odontomas and either of these may occur instead of a tooth. In either case, a mutation in the epithelial cells of the persistent lamina or of the tooth germ itself may change the inherent capacity of the odontogenic epithelium to go through the cap and bell stages necessary for tooth formation and still retain its ability to stimulate mesenchymal differentiation necessary for dentin formation and to form functional ameloblasts and odontoblasts leading to a composite odontoma. Comparative investigations of odontogenic cells in normally forming teeth and tumours showed that differentiation of both normal and abnormal odontogenic cells is accompanied by the expression of some common molecules. Furthermore, the gene products present in normal mesenchymal cells were also found in odontogenic tumour epithelium. A plausible explanation for this is that the odontogenic tumour epithelial cells are recapitulating genetic programs expressed during normal odontogenesis, but the tumour cells demonstrate abnormal expression of these genes.

Clinically, odontomas are either complex or compound, and are classified as:

Intraosseous — these odontomas occur inside the bone and may erupt (erupted odontoma) into the oral cavity.

Extracapsular or peripheral — odontomas occurring in the soft tissue covering the tooth-bearing portions of the jaws.13

Odontomas are often seen in the permanent dentition and very rarely associated with the primary teeth. Compound odontomas are equally distributed among males and females whereas the complex one has a 60% predilection for women.14

They may be discovered at any age, although less than 10% are found in patients over 40 years of age. Although they are commonly asymptomatic, clinical indicators of odontoma may include retention of deciduous teeth, non-eruption of permanent teeth, pain, expansion of the cortical bone and tooth displacement. Other symptoms include paresthesia and swelling. Complex odontomas tend to occur in the posterior region of the jaw, and compound odontomas are more common in the anterior maxilla.14

Histologically the odontoma is not a diagnostic dilemma. It is composed of dentin, cementum, pulpal tissue and enamel. However, mature enamel is lost during the decalcification processing and will not be seen on conventional hematoxylin and eosin stained slides. The compound odontoma recapitulates the organization of a normal tooth but have less calcified pulp, primary dentine and enamel than the normal primary dental cement structure and as bone trabeculate between the denticles. The complex odontoma appears as a disorganized mass of hard odontogenic tissues and are characterized by primary dentine, normal or less calcified enamel, immature cement and a capsule. Loose, myxoid connective tissue with odontogenic epithelial rests may be seen in close association with the lesion, and most often represents normal dental follicular tissue. Fibrous connective tissue with a cystic lining representing a dentigerous cyst may also be seen.15,16

Radiologically, the odontoma presents as a well-defined radiopacity situated in bone, but with a density that is greater than bone and equal to or greater than that of a tooth. It contains foci of variable density. A radiolucent halo, typically surrounded by a thin sclerotic line, surrounds the radiopacity. The radiolucent zone is the connective tissue capsule of a normal tooth follicle. The thin sclerotic line resembles the corticated border seen in a normal tooth crypt. The developmental stages can be identified based on radiologic features and the degree of calcification of the lesion at the time of diagnosis.17,18 The first stage is characterized by radiotransparency due to the absence of dental tissue calcification, while the second or intermediate stage presents partial calcification, and the third or classically radiopaque stage exhibits predominant tissue calcification with the aforementioned surrounding radiotransparent halo.19

Compound odontomas show an irregular radiopaque image with variations in contour and size, composed of multiple radiopacities corresponding to the so-called denticles. In the complex type of lesion radiopacity is not specific; rather a disorganized, irregular single or multiple mass is identified. In both cases (compound and complex odontomas) a radiotransparent halo corresponding to the connective tissue capsule is present.20

The treatment of choice is surgical removal of the lesion in all cases. Ameloblastic fibroodontomas and odontoameloblastomas show a great resemblance to common odontomas, especially in the radiographic examination. Therefore, it has been suggested that all specimens should be sent for microscopic examination to confirm the diagnosis.9,21

REFERENCES


Table 1. Major Characteristics of Compound and Complex Odontomas.

<table>
<thead>
<tr>
<th>Major Characteristics</th>
<th>Compound Odontoma</th>
<th>Complex Odontoma</th>
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</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>The relative frequency among odontogenic tumors varies between 9% and 37%. It’s considered the commonest odontogenic malformation.</td>
<td>The relative frequency among odontogenic tumors varies between 5% and 30%</td>
</tr>
<tr>
<td>Age</td>
<td>Majority of cases appear before the age of 20, making it a lesion of childhood/adolescence</td>
<td>Majority of cases occur before the age of 30 with a peak in the second decade of life</td>
</tr>
<tr>
<td>Gender</td>
<td>Male and female are equally affected</td>
<td>Male and female are equally affected</td>
</tr>
<tr>
<td>Sites</td>
<td>Maxillary anterior region is the most frequent site</td>
<td>Posterior mandibular followed by anterior maxilla are the most frequent sites</td>
</tr>
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<td>Clinical presentation</td>
<td>Painless, non-aggressive lesion, with a more limited potential growth than the complex odontoma. Often associated with an unerupted permanent tooth</td>
<td>Painless, slow-growing and expanding lesion. Often associated with an unerupted permanent tooth.</td>
</tr>
<tr>
<td>Radiological features</td>
<td>Radiopaque mass of multiple, small, calcified structures with an anatomical similarity to normal teeth usually surrounded by a narrow radiolucent zone</td>
<td>More or less amorphous mass of calcified material with the radiodensity of tooth structure, which bears no anatomical resemblance to tooth, surrounded by a narrow radiolucent rim</td>
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<td>Treatment</td>
<td>Conservative surgical enucleation</td>
<td>Conservative surgical enucleation</td>
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