Compound composite odontome, report of three cases with a review of literature

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Abstract

Odontomas are the most common benign, slow growing, and asymptomatic type of odontogenic tumours. The odontomas represent a hamartoma rather than a neoplasm. Although they can present with various signs, the most common complaint is the obstruction of the underlying permanent tooth. The present study reports three cases of compound composite odontoma in three female patients along with a brief review of literature.

Key words: pain, odontoma, tooth deciduous.

Introduction

Odontomas are benign mass of disorganized tissue or in other words a hamartomatous malformation originating from epithelial and mesenchymal cells that give rise to ameloblasts and odontoblasts. They are tooth like structures which once fully calcified stop developing. In 1867 Broca coined the term odontoma and defined it as “tumours formed by the overgrowth of transitory or complete dental tissues”. Depending on radiographic features and pattern of deposition of enamel and dentin the odontomas can be classified as compound odontomas and complex odontomas. In compound odontoma, enamel and dentin is deposited in a manner that the resulting structures resemble the normal anatomy of teeth. In case of a complex odontoma, the deposition of enamel and dentin form an irregularly shaped mass in a disorganized fashion. Although most odontomas exhibit minimal growth potential with no symptoms, some odontomas might exceed the size of the tooth leading to swelling, pain and expansion of cortical bone, resulting in unerupted or impacted teeth, retained deciduous teeth, swelling, or evidence infection which necessitates surgical removal of the odontoma. The most common location for impacted teeth associated with odontomas is the anterior maxilla. In the present case series, we discuss three case reports of compound composite odontoma in three female patients with a common chief complaint of an unerupted permanent tooth.

Case report 1

An 11-year-old female patient reported to the Department of Pedodontics and Preventive Dentistry with the chief complaint of unerupted left upper central incisor for three years. Extra oral examination revealed no gross asymmetry of the face. On intra oral examination, it was observed that the left upper deciduous central incisor (61) was retained. Further, the mucosa over the palatal aspect was blanched and mild inflammation of marginal gingiva and interdental papilla of the tooth (61) was present. Grade II mobility and bleeding through gingival sulcus of 61 was noticed on palpation.
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Based on clinical examination, a provisional diagnosis of a compound composite odontoma was made along with differential diagnosis of ameloblastic odontoma, ameloblastic fibrodontoma, adenomatoid odontogenic tumour and osteoma.

Intraoral periapical radiograph (IOPA) involving the regions 11, 61, 22, 23 revealed multiple irregular masses of calcified tissues present apical to 61.

As a part of the treatment plan, local anaesthesia was administered and the extraction of 61 was done. Subsequently a mucoperiosteal flap was elevated towards the labial aspect of 61. A thin layer of bone overlying the labial surface was removed using mucoperiosteal elevator and the calcified masses were exposed and removed. An intraoperative radiograph was taken to confirm the complete removal of calcified masses. Sharp bony margins were rounded and irrigated with saline povidone-iodine solution. The flap was approximated with 3-0 silk sutures. Macroscopically, the specimen consisted of five small-calcified masses of size ranging from 0.4x0.2x0.2cm to 0.1x0.1x0.01cm bearing no morphological resemblance to teeth. The specimen was sent for histopathologic examination.

The histopathologic specimen was processed and stained with eosin and hematoxylin. It revealed mature tubular dentin enclosing hollow circular structures, and a thin layer of cementum encircling the mass. This report confirmed the diagnosis of compound composite odontoma.

**Case report 2**

A 15-year-old female patient reported to the Department of Pedodontics and Preventive Dentistry with the chief complaint of swelling in the left upper front tooth region for 1 year. No pain was associated with it. On intraoral examination, retained left maxillary deciduous lateral incisor and canine (62 and 63) were noticed. The overlying mucosa was red and oedematous. Based on the clinical examination, a provisional diagnosis of compound composite odontoma was made along with the differential diagnosis of ameloblastic odontoma, ameloblastic fibrodontoma, adenomatoid odontogenic tumour and osteoma.

IOPA of 62 and 63 regions revealed radiopaque masses obstructing the eruption of the permanent tooth (22, 23).

As a part of the treatment plan, local anaesthesia was administered and the extraction of 62 and 63 was done. Subsequently, a mucoperiosteal flap was elevated towards the labial aspect of 62 and 63 and the odontoma was surgically excised (Figure 2).

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**Figure 1: Surgical excision of compound composite odontoma – Case 1**

**Figure 2: Excised odontoma – Case 2**
Macroscopically, the specimen consisted of nine masses of hard tissue, the largest of which was of size 1.3 x 1cm, majority bearing no morphological resemblance to teeth. The specimen was sent for histopathologic examination. On histopathological examination, the decalcified section stained with haematoxylin and eosin showed dentin and pulp space. A layer of cementum with cementocytes are present around the dentin. The ground section showed enamel, dentin, pulpal space, and cellular cementum in an organized manner confirming the provisional diagnosis (Figure 3).

Table 1: Literature regarding the occurrence of odontomas

<table>
<thead>
<tr>
<th>Authors</th>
<th>Years</th>
<th>Age (years)</th>
<th>Sex</th>
<th>Teeth associated</th>
<th>Number</th>
<th>Relation within the bone</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goldberg et al</td>
<td>1981</td>
<td>14</td>
<td>Female</td>
<td>Mandibular molar</td>
<td>Solitary</td>
<td>Intraosseous</td>
<td>Complex</td>
</tr>
<tr>
<td>Torreti et al</td>
<td>1983</td>
<td>12</td>
<td>Female</td>
<td>Maxillary central incisor</td>
<td>Multiple</td>
<td>Intraosseous</td>
<td>Compound</td>
</tr>
<tr>
<td>Smith</td>
<td>1985</td>
<td>12</td>
<td>Female</td>
<td>Maxillary molar</td>
<td>Multiple</td>
<td>Intraosseous</td>
<td>Complex/compound</td>
</tr>
<tr>
<td>Lopez Areal et al</td>
<td>1992</td>
<td>12</td>
<td>Female</td>
<td>Maxillary central incisor</td>
<td>Solitary</td>
<td>Intraosseous</td>
<td>Compound</td>
</tr>
<tr>
<td>Kaneko et al</td>
<td>1998</td>
<td>14</td>
<td>Female</td>
<td>Mandibular molar</td>
<td>Solitary</td>
<td>Intraosseous</td>
<td>Complex</td>
</tr>
<tr>
<td>Ajike et al</td>
<td>2000</td>
<td>15</td>
<td>Female</td>
<td>Maxilla and mandible</td>
<td>Multiple</td>
<td>Intraosseous/Extraosseous</td>
<td>Compound</td>
</tr>
<tr>
<td>Oliveira et al</td>
<td>2001</td>
<td>12</td>
<td>Female</td>
<td>Maxilla</td>
<td>Multiple</td>
<td>Intraosseous</td>
<td>Compound</td>
</tr>
<tr>
<td>Oliveira et al</td>
<td>2001</td>
<td>11</td>
<td>Female</td>
<td>Maxilla</td>
<td>Multiple</td>
<td>Intraosseous</td>
<td>Compound</td>
</tr>
<tr>
<td>Batra et al</td>
<td>2004</td>
<td>14</td>
<td>Male</td>
<td>Maxillary central incisor</td>
<td>Solitary</td>
<td>Intraosseous</td>
<td>Complex</td>
</tr>
<tr>
<td>Batra et al</td>
<td>2004</td>
<td>14</td>
<td>Male</td>
<td>Maxillary central incisor</td>
<td>Solitary</td>
<td>Intraosseous</td>
<td>Compound</td>
</tr>
<tr>
<td>Amailuk and Grubor</td>
<td>2008</td>
<td>15</td>
<td>Male</td>
<td>Maxillary central incisor</td>
<td>Solitary</td>
<td>Extraosseous</td>
<td>Erupted compound</td>
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<tr>
<td>Usha Mohan Das et al</td>
<td>2008</td>
<td>11</td>
<td>Female</td>
<td>Maxillary central incisor</td>
<td>Solitary</td>
<td>Intraosseous</td>
<td>Compound/composite</td>
</tr>
<tr>
<td>Shekar et al</td>
<td>2009</td>
<td>15</td>
<td>Female</td>
<td>Mandibular molar</td>
<td>Solitary</td>
<td>Extraosseous</td>
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<td>Gabriel Serra-Serra et al</td>
<td>2009</td>
<td>11</td>
<td>Female</td>
<td>Mandibular molar</td>
<td>Solitary</td>
<td>Extraosseous</td>
<td>Complex</td>
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<td>Male</td>
<td>Maxillary molar</td>
<td>Solitary</td>
<td>Extraosseous</td>
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<td>Gabriel Serra-Serra et al</td>
<td>2009</td>
<td>27</td>
<td>Male</td>
<td>Mandibular lateral incisor</td>
<td>Solitary</td>
<td>Extraosseous</td>
<td>Compound</td>
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<td>Mahesh Gabhane et al</td>
<td>2010</td>
<td>30</td>
<td>Male</td>
<td>Mandibular molar region</td>
<td>Solitary</td>
<td>Intraosseous</td>
<td>Complex composite</td>
</tr>
<tr>
<td>Vibha Singh et al</td>
<td>2010</td>
<td>17</td>
<td>Female</td>
<td>Mandibular molar region</td>
<td>Solitary</td>
<td>Intraosseous</td>
<td>Complex composite</td>
</tr>
<tr>
<td>Parimala Tyagi and Shilpy Singla</td>
<td>2010</td>
<td>10</td>
<td>Female</td>
<td>Maxillary Lateral incisor</td>
<td>Solitary</td>
<td>Intra osseous</td>
<td>Complex composite</td>
</tr>
<tr>
<td>Kamala K A and Praveena T</td>
<td>2011</td>
<td>22</td>
<td>Male</td>
<td>Mandibular Molar region</td>
<td>Solitary</td>
<td>Intra osseous</td>
<td>Complex composite</td>
</tr>
</tbody>
</table>
Case report 3
An 18-year-old female patient reported to the Department of Pedodontics and Preventive Dentistry with the chief complaint of unerupted right upper lateral incisor (12) for six months. No pain or swelling was associated with it. On intraoral examination, retained deciduous right upper lateral incisor was noted.

IOPA of 52 and 53 regions revealed radiopaque mass obstructing the eruption of 12. Surgical excision was done and sent for histopathologic examination.

Macroscopically four masses of hard tissue were present, the largest being 1.6 x 1.2 cm in size with no resemblance to tooth structure. Microscopically, the section showed layers of enamel, dentin, pulpal space and cellular cementum in an organized fashion and diagnosed as a compound composite odontoma.

Discussion
The most common type of odontoma is the compound odontoma, which comprises odontogenic tissues laid down in a normal relationship. The present case reports are also in accordance with the previous statement (Table 1). The resulting structure bears considerable morphologic resemblance to teeth.

In 1914, Gabell, James, and Payne grouped odontomas according to their developmental origin: epithelial, composite (epithelial and mesodermal), and connective tissue. In 1946, Thoma and Goldman formulated a classification as follows: 6,7

- Gminated composite odontoma - two or more, more-or-less well-developed teeth fused together.
- Compound composite odontoma - made up of more-or-less rudimentary teeth.
- Complex composite odontoma - calcified structure, which bears no great resemblance to the normal anatomical arrangement of dental tissues.
- Dilated odontoma - the crown or root part of tooth shows marked enlargement.
Cystic odontoma - an odontoma that is normally encapsulated by fibrous connective tissue in a cyst or in a wall of cyst.

According to the WHO classification\(^8\), odontoma can be divided into three groups:

Complex: When the calcified dental tissues are simply arranged as an irregular mass, bearing no morphological similarity to the rudimentary teeth.

Compound: Composed of all odontogenic tissues in an orderly pattern that result in many teeth-like structures, but without any morphological resemblance to normal teeth.

Ameloblastic fibro-odontoma: Consists of varying amounts of calcified dental tissues and dental papilla - like tissue, the latter component resembling an ameloblastic fibroma. The ameloblastic fibro-odontoma is considered an immature precursor of a complex odontome.

Some authors have also reported a new type known as 'hybrid odontoma'.

The largest odontoma reported measured approximately 5.5 × 4 × 2.5 cm\(^1\). There is no gender predilection and it can occur at any age.\(^1\)

The etiology suggested by different authors include local infection, trauma, growth pressure, developmental disturbance and hereditary. Though different etiology have been suggested by various authors, the exact etiology of odontoma remains unidentified.\(^8\),\(^9\),\(^10\),\(^12\) The association of odontomas with Gardner's syndrome and Hermann's syndrome have been reported.\(^12\)

Approximately 10% of all odontogenic tumours of the jaws are compound odontomas. The compound odontoma is slightly more common than the complex odontoma, which in turn is more common than the ameloblastic odontoma. It is of interest to note that the majority of odontomas in the anterior segment of the jaws are compound composite in type (61%), whereas the majority in the posterior segment is complex composite in type (34%). Interestingly, both type of odontomas occurred more frequently on the right side of the jaw than on the left (Compound 62%, complex 68%).\(^3\) Compound odontomas make up 10% of all the odontogenic tumors, with a majority of them being the compound composite odontomas (61%) found in the anterior regions of the jaw and on the right side.\(^5\)

References