

## CASE REPORT

### COMPOUND ODONTOME- REPORT OF A CASE

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#### ABSTRACT:

Odontomas are the most common type of odontogenic tumors. They are classified as neoplasm but its clinical presentation resembles hamartomatous growth. They are generally asymptomatic with limited growth potential and low recurrence rate and shows anatomic similarities to teeth. This paper describes a case of compound odontome diagnosed in a 12 year old female who presented with delayed eruption of the primary left anterior teeth. For this, clinical, radiographic and histopathological examination had been done for the evaluation of lesion, which further was treated by surgically removal.

**Key words:** Odontoma, Hamartomatous, Compound.

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#### INTRODUCTION

Odontogenic tumors have been a topic of considerable interest to oral pathologists who have studied and catalogued them for decades.

As odontogenic tumors may contain tissues similar to the ones present in the tooth germ, the diagnostic significance of immature odontogenic tissues in jaw specimens from children and adolescents is not always clear. They could represent neoplasia as well as normal components of the immature dentition.<sup>1</sup> Odontogenic tumors, the term ‘tumors’ being used throughout this article in its broadest sense, constitute a group of heterogenous lesions that range from hamartomatous or non-neoplastic tissue proliferations to malignant neoplasms with metastatic capacity.<sup>2</sup> In 1971, WHO published the first edition of the “Histological Classification of odontogenic Tumours, Jaw Cyst and Allied Lesions.”<sup>3</sup> In 2002, the revised version of Odontogenic tumors were presented by Hans P. Philips and Peter A Reichart. More than 95% of all odontogenic tumours reported in large series are benign and around 75% are represented by odontomas, ameloblastomas and myxomas.<sup>4</sup> Some of the mixed odontogenic tumors, such as ameloblastic fibro-dentinoma and ameloblastic fibro-odontoma presently are not considered as independent entities and decision is made to group them under odontomas as developing odontomas.<sup>5</sup>

Odontomes are the most common benign odontogenic tumors of epithelial and mesenchymal origin.<sup>6</sup> In 1974, Shafer, Hine and Levy<sup>7</sup> described odontomes as tumors of odontogenic origin but their current views support that an odontome is now widely accepted by most authorities as a hamartoma.<sup>8</sup>

The term odontome was coined by Paul Broca in 1867. Broca defined the term as tumors formed by the overgrowth or transitory of complete dental tissues.<sup>9</sup> Odontomas by definition refers to any tumor of odontogenic origin. This is because odontomas result from the growth of completely differentiated epithelial and mesenchymal cells that give rise to ameloblasts and

odontoblasts.<sup>10</sup> These cells in turn form variable amounts of enamel and dentin and pulpal tissue of the odontoma. This enamel and dentin is usually laid down in an abnormal pattern because organization of odontogenic cells fail to reach the normal state of morphodifferentiation. So they are considered as developmental anomalies (hamartomas) rather than true neoplasm

Odontomas constitute about 22% of all odontogenic tumors of the jaws. Odontomas are discovered during the second and third decades of life. One study analyzed 396 cases and showed that they are usually diagnosed between ages 11 and 15.<sup>11</sup> Many times they are found associated with unerupted teeth. The canines, followed by upper central incisors and third molars, are the most frequent teeth impacted by odontomas.<sup>12,13</sup> Generally these malformations are intraosseous, but occasionally they may erupt into the oral cavity. The World Health Organisation (WHO) defines odontomas as two types: complex odontomas, a malformation in which all dental tissues are present, but arranged in a more or less disorderly pattern; and compound odontomas, a malformation in which all of the dental tissues are represented in a pattern that is more orderly than that of the complex type. Approximately, 10% of all odontogenic tumors of the jaws are compound odontomas. Its incidence ranges between 9 and 37% and the complex odontome is between 5 and 30%.<sup>14</sup> The compound odontome most frequently occurs in anterior region of maxilla in contrast to the complex odontome which were commonly found in posterior region of mandible.

The etiology of odontomas is unknown, but it could be due to trauma during primary dentition, as well as to inflammation and infectious processes, hereditary anomalies (Gardner’s syndrome, Hermann’s syndrome). They occur more often in the permanent dentition and are very rarely associated with the primary teeth. Here we present a case of a compound odontome in a 12 year old patient.

**CASE REPORT**

A 12- year old female reported with a complaint of missing teeth in the left upper front region of the jaw. Patient was asymptomatic with no history of pain and swelling. There was no sign of inflammation and the surrounding mucosa was normal.

Intraoral Examination revealed absence of teeth #21, #22 and #23 with normal presence of teeth on the contralateral side (**Figure 1**). Extra oral examination was not relevant.



**Figure 1:** Intra oral examination showing absence of teeth #21, #22 and #23

Radiographic examination; orthopantomogram (OPG) revealed the presence of multiple small radiopaque tooth like structures with radio density equal to that of tooth in the upper left anterior region, surrounded by a narrow radiolucent area (**Figure 2**). These structures had hindered the path of eruption of the respective permanent teeth. Unerupted #21 was seen superiorly to the calcified mass in both OPG and IOPA (**Figure 2, inset**). Other teeth were in various phases of eruption. Based on clinical and radiographic findings a provisional diagnosis of odontome was given.



**Figure 2:** Orthopantomogram(OPG) and **Figure 2, inset:** IOPA; showing multiple radiopacities hindering the path of eruption of the permanent dentition in the left upper anterior region.

Surgical removal of the calcified mass was done and gross specimen revealed numerous tooth like structures, of varying sizes, few of which were attached to soft tissue mass (**Figure 3**).



**Figure 3:** Gross specimen revealing numerous tooth like structures to which is attached soft tissue.

Histological examination of the excised specimen was done and both decalcified and ground section was prepared. Various mineralized components resembling dental hard tissues; which were arranged in orderly pattern was seen. The mature enamel, enamel matrix, dentin, cementum as organized in a normal tooth were observed (**Figure 4 a & b**). One end of the section also shows presence of normal connective tissue stroma (**Figure 4 a**).



**Figure 4: a;** Normal connective tissue stroma attached to dentine with a central core of pulp. **b;** Photomicrograph showing dentin arranged in orderly manner with pulp tissue in the centre and enamel space at the periphery.

## DISCUSSION

Odontomas are the most frequently seen benign odontogenic neoplasms which demonstrate normal structures with/without proper organisation owing to disordered expression and localisation of the extracellular matrix molecules in the dental mesenchyme.<sup>15</sup> In India, its incidence amongst all the odontogenic tumors are 5.3%-11.6%.<sup>16</sup> Hitchin<sup>17</sup> suggested that odontomas are either inherited or are due to a mutant gene or post natal interference with genetic control of tooth development. Odontomas are either complex or compound, are classified as intraosseous, which occur inside the bone and may erupt (erupted odontome) into oral cavity and extraosseous or peripheral that occur in the soft tissue covering the tooth bearing portions of the jaws.<sup>18</sup> They can measure anywhere from a few millimetres to many centimetres in their greatest dimension.<sup>19</sup> Numerous etiological factors are attributed for the formation of odontome which include local trauma, infectious/inflammatory process, odontoblastic hypersensitivity, mature ameloblasts, cell rests of serres (dental lamina remnants), hereditary anomalies such as Gardner syndrome and alterations in genetic components responsible for controlling dental development. It was proposed that locally hyperactive dental lamina may result in "multiple schizodontia" leading to formation of compound odontomas.<sup>19</sup>

They are regularly shaped and can be found solitary or multiple small denticles.<sup>20</sup> There is no gender predilection. A review of literature done in 2009 reported that only nine cases of erupted compound odontomas have been documented in the literature among 20 reported cases of erupted odontomas.<sup>21</sup> Eruption of odontomas may be associated with pain and infection.

According to Gravey et al, compound odontome are further classified :

- Denticulo type: Composed of two or more separate denticles, having crown and root, dental hard tissues resembling to that of tooth.
- Particulate type: Composed of two or more separate masses or particles, bearing no resemblance to tooth, consists of hard dental tissues.
- Denticulo-particulate type: In this type, denticles and particles are present together. Commonly situated in the anterior segment (incisor-canine region of maxilla) of the jaws.

Radiographically, the first stage of an odontome is characterized by radiolucency due to absence of dental tissue calcification and the third or classically radiopaque stage exhibits predominant tissue calcification with the surrounding radiolucent halo.<sup>22,23</sup> The present case was of the denticulo-particulate type; exhibiting numerous radioopaque tooth like structures.

Histopathologically, tooth like structures with central cores of pulp tissue that are encased in shells of dentin and partially covered by enamel surrounded by a fibrous capsule similar to the follicle surrounding a normal tissue

is the classical picture. The calcified mass is usually surrounded by fibrous connective tissue capsule which resembles follicle of a normal tooth and dentigerous cystic lining along with few degenerative odontogenic epithelial islands has also been reported in some cases. Ghost cells i.e. swollen epithelial cells<sup>24</sup> along with spherical dystrophic calcification, enamel concretions and sheets of dysplastic dentin<sup>25</sup> are seen in 20% of the cases. Haematoxylin & Eosin stained section shows tooth like and haphazard arrangement of dental hard and soft tissue including cementum, dentin and pulp consistent with a compound odontome. Special stains like Masson's trichrome stain and Van Gieson can be used to demonstrate the collagen of capsule as well as dentine and pulp cores.

Complications include impaction, delayed eruption of the primary and permanent teeth or over retained teeth. Various cystic lesions like dentigerous cysts, odontogenic keratocysts, and calcifying odontogenic cysts have also been reported with odontomas.<sup>25</sup> In most cases development of odontoma is a result of trauma, the primary predecessors, hence the crown of the permanent tooth germ is displaced and remaining tooth structure forms at an angle which results in dilacerations.<sup>25</sup>

Odontoma has a limited growth potential, but it should be removed because it contains various tooth formulations that can predispose to cystic change, interfere with eruption of permanent teeth and can cause considerable destruction of bone. Because of the very low recurrence, the treatment of choice is surgical removal of the lesion. The surgical management should include proper curettage of soft tissue enveloping the odontomas to prevent any changes of cystic degeneration or recurrence due to persistent lining epithelium. Early and prompt diagnosis of odontomas helps us to adopt a less complex and less expensive treatment, ensures better prognosis, avoid relapse of the lesion, avoid displacement or devitalization of adjacent tooth.

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