

## ODONTOMA (Complex Composite Odontome)

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**Abstract:** An odontomas are malformations of the dental tissues and may interfere with the eruption of associated tooth, which are benign, slow growing and non-aggressive. These lesions are usually asymptomatic and often diagnosed during routine radiography in the second decade of life. Aim is to present a case of complex odontoma associated with an impacted supernumerary tooth in anterior maxillary region and a thorough review on the etiopathogenesis, clinical presentation, radiological findings, histopathological features and treatment aspects of odontomas. [Shah A et al NJIRM 2013; 4(1) : 154-158]

**Key Words:** Odontoma, complex odontome, impacted tooth

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**Introduction:** The term odontoma was first coined by Broca in 1866, who defined it as a tumor formed by overgrowth of complete dental tissue<sup>1,2</sup>. These consist of complete histodifferentiation of different dental tissues, including enamel, dentin and cementum and in some cases pulp also, but they lack morphodifferentiation. Odontomas are classified as benign odontogenic tumors and in general, constitute 22% of all odontogenic tumors of the jaws<sup>3</sup> however, due to their composition, slow growth and non-aggressive behavior, they are considered to be hamartomas rather than true neoplasms<sup>4-6</sup>.

The second edition of the WHO histologic typing of odontogenic tumors classified odontomas under broad category of tumors containing odontogenic epithelium with odontogenic mesenchyme, with or without dental hard tissue formation. Under this classification, three types of odontomas are listed: odonto-ameloblastoma, complex and compound odontoma. According to WHO 2005 and on the basis of gross, radiographic, and microscopic features, odontomas are sub-classified into compound odontoma (small tooth like structures) and complex odontoma (a conglomeration of dentin, enamel, and cementum). Similar to teeth, once fully calcified, they do not develop further, and occurrence of multiple odontomas are rare.

The complex odontomas are less common than the compound variety in the ratio of 1:2. The etiology of odontome is unknown. Several theories have been proposed, including local trauma, infection,

family history, and genetic mutation. It has also been suggested that odontomas are inherited from a mutant gene or interference, possibly postnatal with the genetic control of tooth development<sup>2</sup>. Complex odontomas are typically found in the posterior mandibular region with female predilection and peak in second decade.<sup>2,7,8</sup>.

**Case presentation :** A 21 year old male patient reported to us with the chief complaint of swelling in anterior region of the upper jaw since 8 months with occasional localized pain. Patient was apparently alright before 8 months than complain started with swelling on left side of upper jaw, gradually increasing in size and occasionally associated with pain. Extraoral examination revealed swelling on left side of upper jaw obliterating nasolabial fold. Medical history was not contributory. Intraoral examination (Fig. 1) revealed swelling on left side of upper jaw labially extending from 11 to 24 region, missing tooth (21 to 23), malaligned (24, 25), overlying gingiva was reddish in color. Swelling was firm in consistency (Fig.1).

Patient was advised for a set of radiographs including OPG and CT scan to assess the precise location and extent of the lesion, as well as its relations to the surrounding anatomical structures (Fig. 2 & 3). OPG revealed interdental bone loss mesial and distal to 21, 23 were noted. Along with this well defined, homogenous radiopaque mass was seen between the roots of 21 and 23. The mass was covered with radiolucent halo which was

Figure 1: Intraoral view showing swelling on upper left anterior region



Figure 2: OPG revealed missing 21, 22, 23 and radiopaque mass in 21 to 23 region



well differentiated on distal aspect. Displacement of tooth can also be noted. CT scan (axial view) confirmed OPG findings.

Based on clinical and radiological features, provisional diagnosis of ossifying fibroma, adenomatoid odontogenic tumor, ameloblastic fibro-odontome and odontoma was made. The mass was excised and sent for histopathologic examination. H and E stained section showed enamel spaces, dentinal tubules and pulp tissue arranged haphazardly this confirmed the diagnosis of complex composite odontoma (Fig 4).

**Discussion:** The term “odontoma” by definition alone, refers to any tumor of odontogenic origin<sup>2, 9,10</sup>.

They are considered as developmental anomalies rather than a true neoplasm<sup>11</sup>.

Etiology is unknown, various pathological conditions like local trauma, inflammatory and or infectious processes, hereditary anomalies (Gardner's syndrome, Hermann's syndrome) have

been attributed to the etiology of Odontomas. The cells of the tissues in odontomas are normal but lack organization due to disordered expression and localization of the extra-cellular matrix molecules in the dental mesenchyme. Alterations in genetic component and cellular hyperactivity are responsible for controlling dental development. Remnants of Dental lamina may be an important factor in the etiology of a compound odontoma<sup>12, 13</sup>.

They are generally asymptomatic but can be associated with pain and swelling, Retention of deciduous teeth, unerupted permanent teeth, cortical expansion and teeth displacement are all possible indicators of odontomas<sup>14</sup>.

Compound odontomas show a predilection in the anterior section of the upper maxilla while complex odontomas are typically found in the posterior mandibular region. With a slight preponderance to females, the relative frequency of occurrence varies between 5 and 30%<sup>2</sup>. They may be discovered at any age, while the majority of cases (84%) occur before the age of 30, with a peak in the second decade of life, less than 10% are only found in the patients over 40 years of age<sup>1,7</sup>. Clinically they can be classified as intra-osseous (central), extra-osseous (peripheral) and erupting odontomas. The central odontomas are common representing 51% occurring in anterior maxilla( compound ) followed by mandibular posterior region (complex).

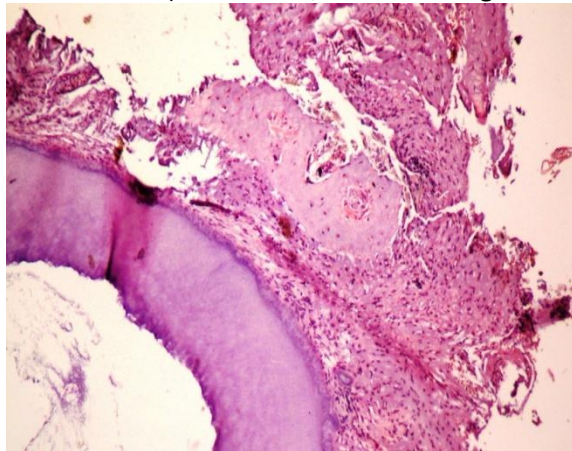
Peripheral odontomas are rare and occur in soft tissue over tooth bearing regions, more oftenly compound type is seen. Erupted odontomas are generally seen located coronal to the erupting or impacted tooth or superficially in the bone and may have enabled its eruption in the oral cavity<sup>18</sup>. In the present case the odontoma was the complex type in the maxillary anterior region, of a 21 year old male patient which is a rare occurrence.

The radiographic appearance of complex odontome depends on their stage of development and degree of mineralization. Radiographically, odontoma presents as a well-defined radiopacity

Figure 3: CT axial view showing radiopaque mass in 12 to 24 region



Figure 4: Photomicrograph showing enamel spaces, dentinal tubules, pulp tissue and cementum. (H&E stain, 10 x magnification)



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. It is present with a radiolucent halo, typically surrounded by a thin sclerotic line, surrounding the radiopacity. Radiolucent zone is the connective tissue capsule of a normal tooth follicle. Thin sclerotic line resembles the corticated border seen in a normal tooth crypt. Developmental stages can be identified based on radiologic features and the degree of calcification of the lesion at the time of diagnosis<sup>15,16</sup>. The first stage is characterized by radiolucency due to lack of calcification. Partial calcification is observed in the intermediate stage, while in the third stage the lesion usually appears radiopaque with amorphous masses of dental hard tissue surrounded by a thin radiolucent zone corresponding to the connective tissue capsule

histologically<sup>2,17</sup>. In the present reported case, the radiographic appearance was seen as a multiple dense radiopaque structure outside the jaw bone, with clear external margins presenting normal organization of dental tissues, i.e. enamel, dentine, and pulp in association with an impacted supernumerary tooth.

Very often odontomas are associated with impacted teeth and nearly three quarter of them erupt following the removal of odontomas. A significant number of cases are also associated with occurrence of cyst (27.6%). Based on these potential complications all cases of odontomas should be properly evaluated and removed<sup>18, 19</sup>. Treatment of choice is surgical removal of the lesion in all cases; followed by histo-pathological study to confirm the diagnosis. The steps in removal of an odontoma in close relation to an adjacent impacted normal tooth should comprise removal of tumor and exposure of the impacted tooth. There has been no general agreement on the best management approach for impacted teeth associated with odontomas. The treatment options comprise surgical extraction, and surgical opening and postsurgical clinical and radiological controls to evaluate the course of these teeth. Orthodontic therapy may be applied. Removal of the odontome in the primary operation led to the eruption of the impacted tooth in 45% of cases, with a second surgical and/or orthodontic intervention giving better results. The morphology of the tooth, its location and position in the jaw and the available space in the dental arch should be examined radiographically, which will determine the treatment<sup>12</sup>. In this case, surgical removal of the lesion and associated supernumerary tooth was performed. The excised specimen was subjected to histopathologic examination. Odontomas, both compound and complex, must be examined microscopically, to establish a definitive diagnosis. Histologically, they comprise of varying amount of enamel, pulp tissue, enamel organ and cementum in varying proportions and varying arrangements. Odontogenic epithelium, may be present in some cases. The connective tissue capsule is similar to that of dental follicle. Ghost cells are often seen

along with spherical dystrophic calcification, enamel concretions sheets of dysplastic dentin. Thus, the diagnosis of odontome is usually made by clinicopathologic correlation<sup>20,21</sup>

**Conclusion:** We present a rare case of complex odontome in maxillary anterior region in a 21 yrs old male patient. Odontomas are generally discovered on routine radiography when they are asymptomatic, eventual growth of odontomas can be associated with displacement of teeth, disfigurement and also associated potential complications like cystic transformation. The authors stress upon the importance of regular dental check-ups and use of panoramic radiography particularly in the 2<sup>nd</sup> decade of life for early detection of such dental abnormalities and prevention of adverse effects. The early diagnosis of odontomas allows the adoption of less complicated and expensive treatment, and ensures better prognosis and increase the possibility of preservation of the impacted teeth through various treatments.

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