

## Giant complex odontomas erupting in the Oral Cavity

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### Abstract

Odontomas are the most common odontogenic tumors. Complex odontomas are less frequently found as compared to the compound odontomas and they are considered to be hamartomatous malformations rather than true neoplasms. Usually they have an asymptomatic evolutionary course. The structural composition of an odontoma consists of mature dental tissues. Based on the degree of morpho-differentiation or on the basis of their resemblance to normal teeth, they are divided into compound and complex odontomas. The compound odontoma is composed of multiple, small tooth-like structures. The complex odontoma consists of a conglomerate mass of enamel and dentin, which bears no anatomic resemblance to a tooth. They are usually diagnosed on routine radiological examinations and are often slow growing and non-aggressive in nature. Occasionally, they become infected and cause pain and swelling, facial asymmetry, allows adoption of a less complex and less expensive treatment and ensures better prognosis. The use of CT, in addition to OPG, is valuable in the visualization of the relationship of the unerupted second and third molar and a complex odontoma, thus aiding in the surgical management. Here, we report case of complex odontoma and the importance of CT in terms of its diagnosis and treatment planning. This case is significant as there are few reports of complex odontoma erupting in the oral cavity. Eruption of an odontoma into the oral cavity is rare. Most odontomas (70%) are associated with abnormalities such as impaction, malpositioning, aplasia, malformation, devitalization of adjacent teeth. Therefore should be removed as early as possible.

**Keyword:** Complex odontoma, OPG, Computed tomography, Dense radio-opacity, Mandible.

### Introduction

Odontomas are the most common of the odontogenic tumors of the jaws and are characterized by their slow growth and non aggressive behavior. They are mixed tumors, consisting of both epithelial and mesenchymal cells that present a complete dental tissue differentiation (enamel, dentin, cementum and pulp).<sup>(1-2)</sup> The lesions are invariably asymptomatic and are usually discovered on routine radiographical examinations during the second and third decades of life.<sup>(2-3)</sup> The CT imaging characteristics of complex odontomas have been reported in only a few cases and to our knowledge, in only 2 reported cases in the literature.<sup>(1-2)</sup> We present here, the contribution of OPG and CT in diagnosing a large painful complex odontoma.

### Case Report

A 21 year old male patient reported to the Department of Oral Medicine and Radiology, sharad pawar dental college, DMIMS(DU) Sawangi (Meghe) Wardha, India presented with a complaint of pain and swelling in the lower left jaw posterior region since 6 months. The clinical examination revealed a well defined, bony hard, painful intra oral swelling in the left retro molar region. The swelling seemed to extend from the distal surface of the left first molar to the retro molar region on the left side. The surface of the swelling was smooth and slightly irregular due to the sharp cusp protuberance of third molar which is embedded in lesion. The lower left second and third molar was found to be missing. Bicortical expansion was present.

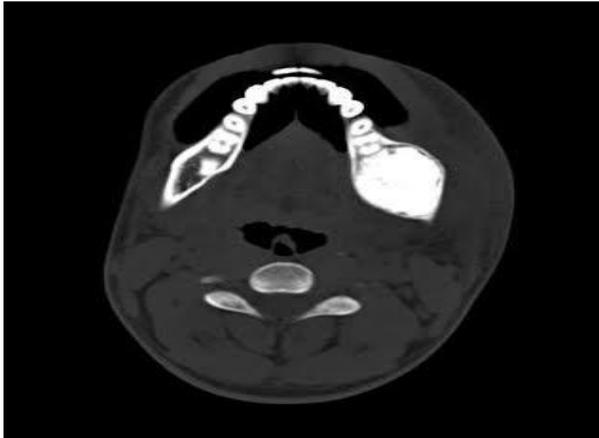
OPG revealed a huge, well defined, uniformly dense, rounded radiopacity (about 5X4 cm) which was distal to the mandibular left first molar and overlying the coronal portion of the mandibular second and left third molar, second molar which was displaced mesio-inferiorly and third molar embedded. A uniform, well defined, radiolucent halo surrounded the radiopacity. The radiopacity seemed to superimpose on the roots of the left first molar. The mandibular canal was displaced inferiorly. There was no evidence of any root resorption in the left mandibular first molar.



**Fig. 1: Show diffuse painful bony hard, intra oral swelling in the left retro molar region**



**Fig. 2:** OPG revealed well defined, uniformly dense, rounded radio-opacity (about 5X4 cm), distal to the mandibular left first molar



**Fig. 3**

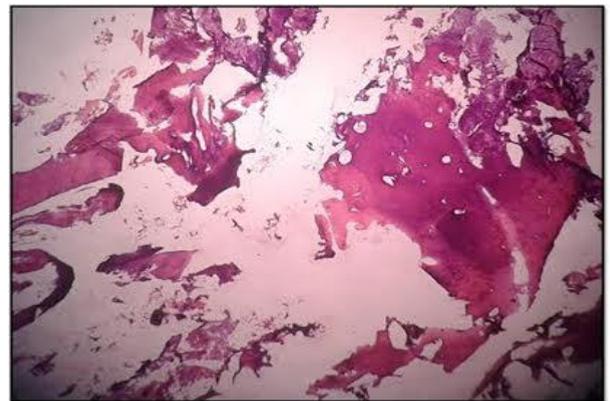


**Fig. 4**

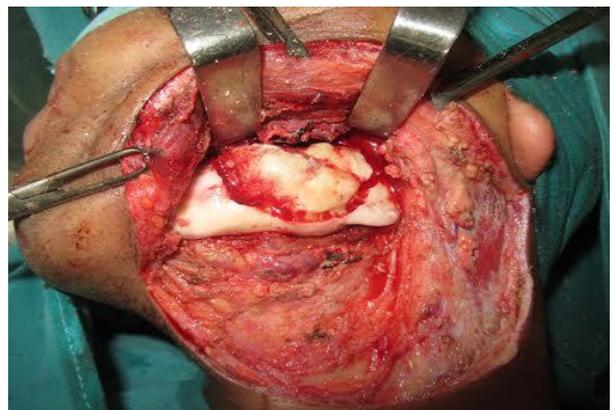
**Fig. 3 & 4:** CT Axial & coronal section showing a uniformly hyperdense lesion surrounded by a thin hypodense line on left posterior aspect of mandible with displaced impacted tooth



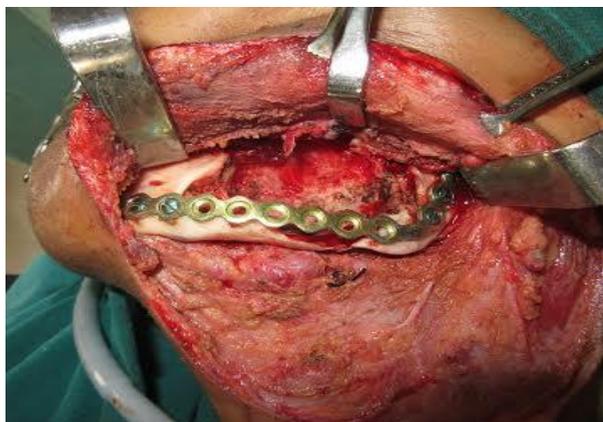
**Fig. 5:** Resected specimen and extracted second molar



**Fig. 6:** Photomicrograph (× 4) showing decalcified dentin and empty spaces of decalcified enamel intermixed with haphazardly arranged areas containing remnants of immature enamel matrix



**Fig. 7:** Show exposure of surgical site



**Fig. 8:** Show surgical excision followed by reconstruction plate placement



**Fig. 9:** Postoperative OPG



**Fig. 10:** Postoperative profile photos

Computerized tomography scan images were obtained in the axial, coronal, and panoramic views. The axial section revealed a well defined, homogenously hyper dense lesion with 1800 Hounsfield units, within the left medullary cavity of the posterior aspect of the mandible, extending up to the level of the ramus. The lesion was displacing an impacted 2<sup>nd</sup> molar inferiorly.

A thin, well defined, hypo dense area surrounded the hyper dense lesion, which was suggestive of a soft tissue capsule. There was an evidence of the bucco-lingual expansion of the cortex, with no break. There was no evidence of soft tissue extension. The coronal, axial view and reconstructed panoramic CT views showed the size and extent of the lesions in all the three dimensions, which was essential for the surgical planning. Surgical

excision was carried out under general anaesthesia and the histological analysis confirmed a *complex odontoma*. After the surgical excision no any augmentation procedure was carried out. After first recall visit, healing of such huge bone was seen. No complication was present. Radiological checkup was performed after tumor enucleation.

### Discussion

The term 'odontoma' (or odontome) which was firstly described by Paul Broca in 1867, was originally used as a general descriptive for any tumour (in its broadest sense) of odontogenic origin.<sup>4</sup> Broca defined the term as 'tumours which were formed by the overgrowth or the transitory of the complete dental tissue'. Odontomas are composed of all mature components of dental hard and soft tissue: enamel, dentin and pulp tissue. Because of their limited slow growth and well differentiation, they are generally considered to represent hamartomas rather than true neoplasm.<sup>(5)</sup> The aetiology of odontomas has been attributed to various pathological conditions like local trauma, inflammatory and/ or infectious processes and hereditary anomalies (Gardener's syndrome, Hermann's syndrome). Odontoblastic hyperactivity and alterations in the genetic component is responsible for controlling the dental development.<sup>(6-8)</sup> Odontomas are benign tumors which contain various component tissues of the teeth and they are the most common odontogenic tumors which constitute 22% of all the odontogenic tumors of the jaws.<sup>(9)</sup>

There are two types of odontomas: complex odontomas and compound odontomas – the latter being twice as frequent as the former. Compound odontomas show a predilection in the anterior section of the upper maxilla, while complex odontomas are typically found in the posterior mandibular region.<sup>(10)</sup> They may be discovered at any age, although less than 10% of them are found in patients over 40 years of age. Although they are commonly asymptomatic, the clinical indicators of odontoma may include the retention of the deciduous teeth, the non-eruption of the permanent teeth, pain, expansion of the cortical bone and tooth displacement. Other symptoms include anesthesia in the lower lip and swelling in the affected area.<sup>(2,7)</sup>

Many classifications have been proposed from time to time to classify odontomas.

Thoma and Goldman in 1946 gave a classification as:

- Geminated composite odontomas: nearly well-developed fused teeth.
- Compound composite odontomas: made up rudimentary teeth.
- Complex composite odontomas: calcified structures not resembling normal anatomical arrangement of dental tissues.
- Dilated odontomas: enlarged crown or root portion of tooth.

- e. Cystic odontomas: odontoma encapsulated by fibrous connective tissue in a cyst or in the wall of a cyst.

World Health Organization (WHO) classified odontomas into three groups:

- a. Complex odontoma; when the calcified dental tissues are simply arranged in an irregular mass bearing no morphological similarity to rudimentary teeth.
- b. Compound odontoma: composed of all odontogenic tissues in an orderly pattern, which result in many teeth-like structures, but without morphological resemblance to normal teeth.
- c. Ameloblastic fibro-odontome: consists of varying amounts of calcified dental tissue and dental papilla-like tissue, the later component resembling an ameloblastic fibroma. The ameloblastic fibro-odontome is considered as an immature precursor of complex odontoma. A new variant called as hybrid odontomas are quoted in few published literatures.

H.M. Worth in 1937 classified odontomas as:

- a. Epithelial odontomas arising from dental epithelium, e.g., Dentigerous cyst, Adamantinoma.
- b. Composite odontomas arising from the dental epithelium and dental mesoblastic tissues, e.g., complex, compound, geminated and dilated

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

- Intra-osseous — these odontomas occur inside the bone and may erupt (erupted odontoma) into the oral cavity.
- Extra-osseous or peripheral — odontomas occurring in the tissue covering the tooth-bearing portions of the jaws.

In the present case, pain was the symptom, probably due to secondary infection, which can occur because of the replacement of bone by a large amount of avascular hard tissue.

The radiological appearance of complex odontomas depends on their stage of development and the degree of mineralization. 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 radio-opaque, with amorphous masses of dental hard tissue which are surrounded by a thin radiolucent zone which corresponds to the connective tissue capsule histologically.<sup>(7)</sup>

Our case showed a well defined, homogeneously dense, radio opaque internal structure which was surrounded by a radiolucent halo which was surrounded by a thin sclerotic line around an impacted left second and third molar. Additional radiographical evaluation with CT was necessary to determine the extension, expansion, thinning and perforation of the lesion, which can be readily assessed by using bone windows. The precise relationship of the unerupted third molar to the large complex odontoma in the sagittal plane was easily

visualized by CT, thus aiding in the surgical management. The degree of opacity, the location, the well defined border and the zone of lucency differentiate complex odontomas from other opaque lesions within the jaw. The lesions may share radiographical features with complex odontomas include Cementoblastoma, Osteoid Osteoma, Cemento-ossifying fibroma and Focal cementosseous dysplasias.<sup>(3)</sup>

Histopathologically, odontomas are composed essentially of mature dental tissues that is enamel, dentin, cementum, and pulp tissue and may be arranged in discrete tooth-like structures (compound odontoma) or as unstructured sheets (complex odontoma). The bulk of the tumor usually consists of normal appearing dentin with a fibrous capsule and a supporting fibrous tissue in a small amount. Include epithelial and mesenchymal tissue they can undergo cystic degeneration of the enamel organ after partial or total development of the crown. Ghost cell keratinization is occasionally seen in the enamel-forming cells.<sup>(5)</sup>

The surgical treatment consists of complete enucleation and curettage of the lesion and the surrounding area. The recurrence is occasional, but uncommon. A careful histological and radiographical examination of these tumors is necessary, because these lesions may resemble a much more aggressive neoplasm, the odonto-ameloblastoma.<sup>(2)</sup>

## Conclusion

Odontomas are more commonly associated with impacted teeth and rarely erupt into the oral cavity. Even though these lesions are benign in nature, they can give rise to inflammation, pain and infection when they erupt in the mouth. Early detection and treatment of odontomas could increase the possibility of preservation of the impacted teeth. The treatment of choice is surgical removal of the odontoma, followed by histological analysis. As was demonstrated by this report, early diagnosis of odontomas on a routine radiographic examination.

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