Compound Composite Odontoma in Anterior Maxilla - A Case Report

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Abstract:

Odontoma is an odontogenic benign tumour composed of hard dental tissues, epithelial and mesenchymal cells. In most cases these lesions are usually asymptomatic and are often observed on routine radiographs. Morphologically, odontomas are classified as complex type when present as irregular masses containing different type of dental tissues or compound if there is anatomic similarity to teeth like denticles. An8-year old patient reported to the Department of Pedodontic and Preventive Dentistry, Santosh Dental College, Ghaziabad with doubt about the apparent delay in eruption of his left permanent maxillary incisor. Radiographic investigation showed the presence of a lesion formed by many small tooth-like structures that obstructed the respective permanent tooth eruption. The lesion was provisionally diagnosed as odontoma. Under local anesthesia, access to the lesion was achieved via intra-oral approach followed by surgical enucleation. The clinical presentation of the lesion confirmed the diagnosis of Compound Composite Odontoma. Routine follow-up was done for a year until the permanent tooth erupted and no recurrence was seen. Early diagnosis and treatment of Compound Odontoma ensures good prognosis and minimal psychological trauma to the patient.

Keywords: Compound Composite Odontoma, Odontoma, Anterior Maxillary tumour, Odontogenic tumour, unerupted incisor.

Epidemiology:

Odontogenic tumours are hamartomas with limited and slow growth. The reported incidence varies from 22%-67%.[1,2] The etiological factors associated with odontomas are trauma to primary dentition, inflammatory diseases and infections, hereditary anomalies like Gardner syndrome, Hermann syndrome, familial colonic adenomatosis, gene induced odontoblastic hyperactivity and altered genes.[3,4]These tumours are classified as Compound or Complex depending upon their radiographic and microscopic features. The World Health Organization (WHO) describes Complex Odontomas as lesions with well-formed, disorderly arranged dental tissues whereas Compound Odontomas as lesions with normal dental tissues with altered size and conformation giving rise to small tooth like structures called denticles. In general, compound odontomas are more common than complex odontomas.[5-8] Depending upon the odontoma calcification, various developmental stages can be classified as radio-transparent, intermediate stage or radio-dense.Management usually consists of surgical enucleation with a favorable prognosis and a scant chance of relapse. It is seen that surgical removal during the non-calcified tissue stage usually leads to recurrence.[6]However, there are very few studies with consensus regarding the epidemiological and clinical characteristics of odontomas. A meta-analysis of the epidemiology of Odontomas by Sanchez O.H et al (2008) obtained results from a PubMed literature search.[9] They evaluated the gender, age, location, clinical manifestation and evaluation of patient management of these tumours. In a total of 3065 cases of registered odontomas, 61.3% were composite odontoms, 37% complex odontomas and 1.7% could not be classified into any group.[9] A greater predilection was seen in females compared to males[9] though many other studies show no gender variation.[5,7,10,11] The mean age of the patients was found to be 15.15 years.[9] The results also showed an earlier mean age at the time of diagnosis in case of compound odontoma (14.8 years) compared to complex odontomas (21 years).[9] Most of the lesions were located in the maxilla (56%) with 44% in the mandible. Among the lesions in the maxilla, 72.8% were in the anterior zone, 18.3% in the posterior maxilla and 8.9% in the middle zone. In the mandible, lesions in the anterior mandible were seen in 44.4% cases, 40.6% in the posterior region and 15% in the middle zone. The type of odontoma was correlated to the location.[9] The complex odontoma showed 53.8% cases in the maxilla and 46.2% in the mandible. Many otherstudies have shown higher occurrence of complex odontoma in the posterior mandible.[9]On the contrary, 59.5% cases of compound odontoma was seen in maxilla and 40.5% cases in the mandible. This finding corroborateswith many other authors.The clinical manifestation showed symptomatic lesions in 57.1% cases and 42.9% with no symptoms. The most common clinical manifestations were retention of permanent teeth (55.4%) followed by swelling (14%), agenesis of permanent teeth (7.2%), pain (4%), infection (3.3%) and dental malpositioning (1.1%). Patient management in 94% cases consisted of surgical removal under local anaesthesia and 6% under general anaesthesia.[9]

Clinical Features:

The lesion usually presents as asymptomatic and hard swelling which is slow growing and often associated with an unerupted tooth.[1] The permanent maxillary incisors are the teeth most often involved in Compound Odontomas. The site of occurrence is greater in anterior maxilla followed by the posterior and middle zone. The tumours are usually non- aggressive.[12]

Roentgenographic Features:

The radiographic findings of Compound Composite Odontoma frequently resemble other Odontogenic lesions such as ameloblastic fibro-odontoma, ameloblastic fibroma and odontoameloblastoma. The dental roentgenogram reveals anunilocular, well delimited lesion with multiple radio-dense tooth-like denticles and a radiolucent halo with a distinct radio-opaque border.[6]Three developmental stages can be identified based on degree of calcification at the time of diagnosis. The first stage corresponds to absence of dental tissue calcification and appear radio transparent, the second stage corresponds to partial calcification and the third stage shows significant calcification with dense radio-opaque zones. In complex odontoma the radiographic zone is irregular and disorganized.[6]

Microscopic Features:

The histopathologic examination of Compound Odontoma shows a central core resembling pulp tissue, surrounded by primary dentin and partially mineralized enamel with primary cementum. Shafer and associates also reported presence of unique cells or Ghost cells that constituted 20% of the cells. These cells were swollen epithelial cells with many tonofibrils.[12,13,14,15]

Treatment & Prognosis:

Conservative surgical enucleation is treatment modality of choice. Recurrence of Compound Composite Odontoma is exceptionally rare. Therefore, prognosis is good.

Case Report:

An 8 year old Indian boy presented to the Pediatric Dental Department with the chief complaint of missing left upper front tooth since birth (Fig.1a.1b).The patient had no relevant medical history. The past dental history revealed that he had visited a dentist 5 years back with the same complaint and no treatment was recommended. The patient's guardian followed up with the dental visits since the eruption of the right permanent central incisor had taken place with the last visit being 12 months back. The child had no history of trauma or swelling or pain in the facial region or in the localized area of missing tooth. However, the deciduous tooth was also reported absent in the same region. A release incision was placed in the same region 12 months back.

Extraoral examination presented no significant finding. On intraoral examination, the labial aspect of the left upper incisor region revealed a hard, oval swelling on palpation measuring 2cm×1cm in dimension. There was no prominence seen on the palatal aspect(Fig.2).The maxillary permanent right central incisor had erupted.

Intraoral periapical radiograph (IOPA), OPG and maxillary occlusal radiographs were taken. The IOPAxray showed few radiopacities in the anterior maxillary alveolar bone (Fig.3). The OPG demonstrated the presence of teeth like impacted, malformed irregular radiopacities within the alveolar bone in the left maxillary incisor region (Fig.4). The radiopaque masses / denticles extended within the cervical third portion of the alveolar bone upto the basal maxilla. What appeared as Compound Odontoma was evident on the maxillary occlusal film.

For precise surgical removal of the lesion, a CT scan was performed on a Carestream 9300 to evaluate left anterior maxilla (Fig 5, 6,7). Images were acquired 360 degree around the patient's head with slice thickness of 0.09mm. The acquired data was reconstructed into panoramic projections to depict the maxilla with low radiation dose. The CT scan revealed the precise palatal location of left permanent maxillary central incisor 21 and left permanent maxillary lateral incisor 22 was located labial to 21. The incisors were palatally high in the basal maxilla. Multiple denticles were present labial to both 21 and 22. The denticles were identified as Compound Odontoma in relation to left permanent maxillary incisor.

The treatment plan involved preparation of a surgical window through the left labial cortical plate followed by enucleation of the area under

local anaesthesia (Fig.8,9,10,11,12). The curetted mass consisted of multiple tooth like denticles in the bony cavity. The surgical site was irrigated and sutured with 3-0 black silk and the tissue was sent for histopathological examination.

The histopathological report showed an organized arrangement of dental tissue including cementum, dentin, enamel matrix and pulp consistent with the finding of Compound odontoma (Fig.13).

Follow-up was done in intervals of 7 days, 1 month, 3 months, 6 months and 12 months (Fig.14,15). The left permanent maxillary central incisor erupted after 12 months following coronoplasty with soft tissue diode laser (Fig.16,17,18,19).The recurrence of the tumour did not take place as confirmed on radiographic examination.

Conclusion:

Compound Composite Odontomas cause obstruction in the eruption of teeth. If the lesion remains asymptomatic it may go undetected and may remain for years without clinical manifestation. Early diagnosis and surgical curettage allows favorable results for establishing normal eruptive pathway. It also prevents treatment complications and psychological trauma to the patient. Complete surgical removal and histopathological examination at an early stage allows us to rule out more aggressive tumours like ameloblastic fibroma and ameloblastic fibro-odontomas.

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Fig.1a:Intraoral Labial view of Missing Left Maxillary Permanent Incisor

Fig.1b: Intraoral Lateral view of Missing Left Maxillary Permanent Incisor

Fig 2: Intraoral Palatal view showing Intra-bony Swelling with no prominence in palatal cortical plate

Fig.3 :Pre-operative Intraoral Periapical Radiograph showing multiple impacted tooth like denticles/malformed/irregular opacities i.r.t impacted teeth #21,22

Fig.4: Orthopantomogram (OPG) showing multiple impacted tooth like denticles/malformed/irregular opacities noted i.r.t impacted teeth #21,22. with narrow radiolucent rim. Radiopaque masses extend within the cervical third portion of the alveolar bone upto the basal maxilla.

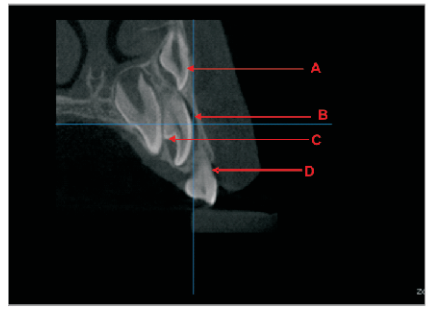

Fig.5: CBCT Cross-sectional view showing
A – well defined, partially mineralized tooth like density is seen within the basal maxilla.
B – tooth #22
C – tooth #21

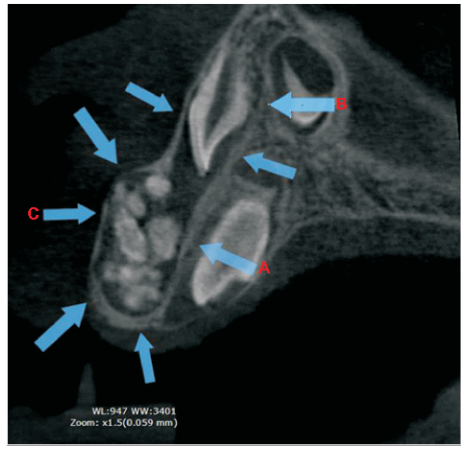

Fig.6: CBCT Left Anterior Maxilla showing slice thickness of 0.09mm
A - Palatally located unerupted, partially unmineralized almost upto the CEJ tooth #21 is noted. Tooth is located palatal i.r.t multiple radiopacities (C)
B- Unerupted tooth #22 is located labially i.r.t tooth #21.

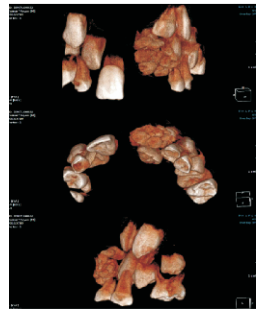

Fig.7: 3D Reconstruction CBCT Scan Anterior Maxilla showing Teeth Present: 14,53,X,11,X,62,63,X,65

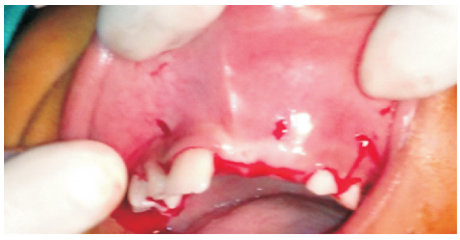

Fig.8: Trapezoidal incision

Fig.9: Full thickness mucoperiosteal flap raised showing bony prominence irt labial cortical plate

Fig.10:Well encapsulated multiple tooth like denticles after removal of thin labial cortical plate

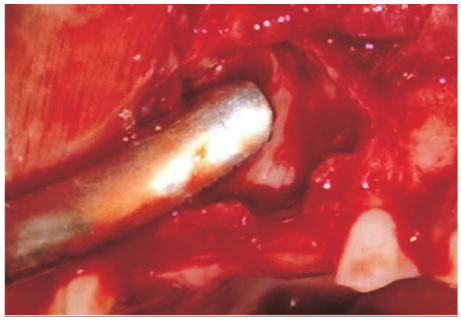

Fig.11: Enucleation of the bony cavity

Fig.12:Several small teeth like structures along with the labial cortical plate

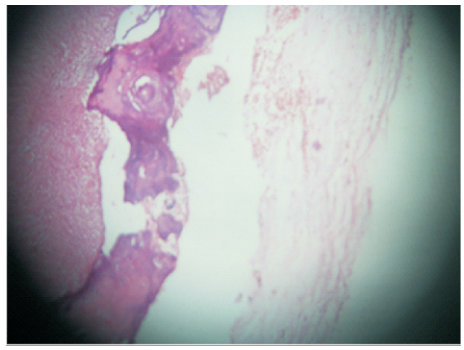

Fig.13: Histopathologic features showing Calcified structures with resemblance to tooth like structures with-
A-pulp tissue in the central portion ,
B-surrounded by dentin shell and
C-covered by enamel matrix

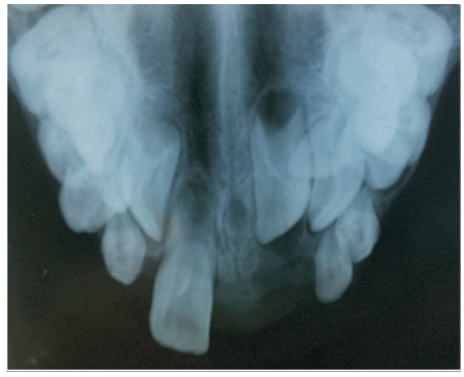

Fig.14:Post-operative follow up radiograph after 7 days showing no radio-opaque denticles in the 21,22 region. Erupting permanent incisors are much below the basal maxilla compared to pre-operative view.

Fig 15: Follow up radiographic view after 12 months showing descent of left permanent maxillary central incisor

Fig.16: Intraoral maxillary view after 12 months showing prominence of Left Permanent Maxillary Central Incisor

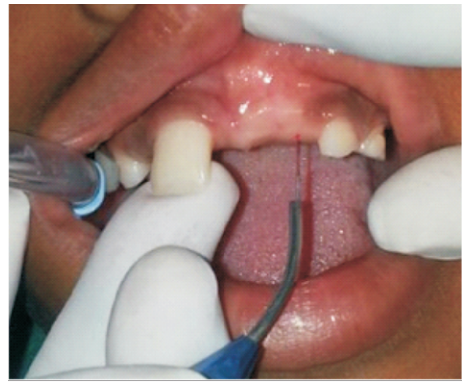

Fig.17: Coronoplasty with Diode Laser

Fig.18: Exposure of the Left Permanent Maxillary Central Incisor

Fig.19: Eruption of the Left Permanent Maxillary Central Incisor after 7 days post-laser operculectomy (coronoplasty)

Fig.20: Complete eruption after 18 months follow up