

# Compound- Complex odontoma- An important clinical entity

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## **Abstract:**

Odontomas are mixed odontogenic tumors in which both the epithelial and mesenchymal components undergo functional differentiation and form enamel and dentin. The World Health Organisation classifies odontomas into: compound and complex odontomas. Although the occurrence of either compound or complex odontoma in the oral cavity is reported; very rarely an odontoma may show features of both. This is a case report of a large odontoma with both compound and complex features, occurring in the left palatal region, which reported to the Department of Oral and Maxillofacial Surgery, Dr. Syamala Reddy Dental College and Hospital. Since these lesions are generally asymptomatic, the correct diagnosis of these lesions in the routine radiographic examination is important, as is the prompt treatment.

**Key words:** Clinical decision making, pain, tooth loss.

## **Introduction:**

Odontomas are mixed odontogenic tumors in which both the epithelial and mesenchymal components undergo functional differentiation and form enamel and dentin.<sup>1</sup> They are hamartomatous lesions rather than true neoplasms.<sup>2-5</sup> WHO classifies odontomas into: compound and complex odontomas. These are composed of more than one type of tissue and hence termed as composite odontoma. The compound odontoma is a malformation in which all the dental tissues are in a more orderly pattern so that the lesion consists of many tooth-like structures.<sup>4,6,7</sup> When these calcified dental tissues are simply an irregular mass, bearing no morphologic similarity even to rudimentary teeth, they are termed composite complex odontoma.

This is a case report of a large compound- complex odontoma, occurring in the left palatal region, which reported to the Department of Oral and Maxillofacial Surgery, Dr. Syamala

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Reddy Dental College and Hospital. There have been reports of compound odontomas occurring in the maxillary anterior region<sup>3</sup>, complex odontomas occurring in mandibular posterior region<sup>8</sup> and multiple odontomas occurring in the entire maxillary and mandibular region<sup>5,9</sup>. Occasionally, however lesions may show features of both compound and complex odontomas<sup>2</sup>; such case reports are very few in number.

In our case, along with the complex odontoma mass, we also encountered two tooth-like structures present within the lesion and hence this is a rare case which has features of both complex and compound Odontomas.

### Case history:

A 21-year-old male patient came to the department of oral and maxillofacial surgery with the complaint of a decayed tooth in the upper right back tooth region. On intraoral examination, decayed right upper molar tooth (#16) and missing lower molar teeth (36 and 46) were observed. Radiological examination revealed a mixed radio-opaque and radiolucent lesion in relation with the upper left premolar-molar region (figure 1 and 2) and two supplemental teeth in relation to the lower left posterior region. Tube shift radiological technique was done to localize the lesion palatally. Pulp vitality test was carried out and all the teeth in the upper left quadrant adjacent to the lesion were found to be vital. The medical and family history was non-contributory.

A provisional diagnosis of an odontoma was made based on the radiological findings and excisional biopsy of the same was planned under local anesthesia. Since the patient desired to get his teeth aligned in future, it was decided that surgical treatment with regards to the impacted lower supernumerary teeth was deferred until an orthodontic opinion was taken.

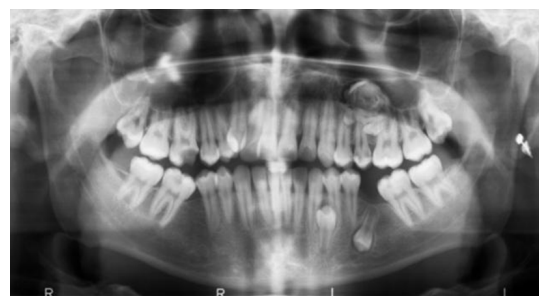
### Surgical procedure:

Adequate local anesthesia was achieved using Xylocaine (2%) with adrenaline (1:80,000) for the procedure. A crevicular incision was placed palatally and a full thickness mucoperiosteal flap was raised from the right canine to the left second

molar. On reflection, a palatal bulge was observed in the region of the odontoma. The overlying bone was removed with a carbide bur and the odontoma was exposed (figure 3). After adequate bone removal, the odontoma was sectioned and removed in multiple pieces. The calcified lesion was dense and drilling through it was more difficult than adjacent bone. The entire odontoma was removed with the fibrous lining covering it (figure 4). A confirmatory radiograph was taken intraoperatively to determine complete removal of the lesion. After adequate hemostasis, the mucoperiosteal flap was closed with 3-0 silk sutures.

A preformed acrylic stent was inserted immediately postoperatively. The stent was left back in place for the next one week.

By correlating the clinical, radiological and histopathological findings, a definite diagnosis of odontoma (with both compound and complex features) was made. A follow up was done periodically and the healing was uneventful (figure 5 and 6)



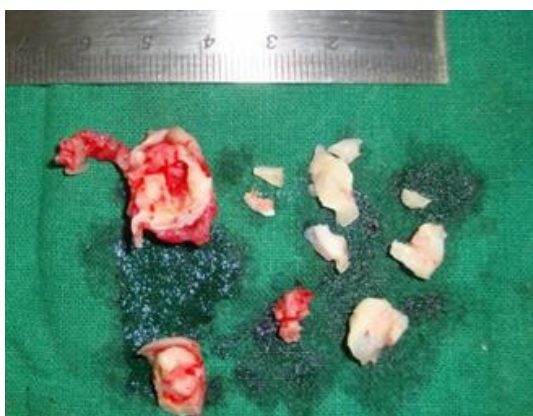
**Fig 1: Radiographic appearance of the lesion**

**Discussion:**  
Paul Broca was the first to coin the term “odontoma” in 1867.<sup>6</sup> Odontomas are mixed odontogenic tumors in which both the epithelial and mesenchymal components undergo functional differentiation and form enamel and dentin.<sup>4</sup> The enamel and dentin are laid down in an abnormal pattern because the organization of the odontogenic cells fails to reach a normal state of morphodifferentiation.<sup>4</sup>

The lesion presented here had a complex odontoma mass and two ‘tooth – like’ structures present within the lesion - one resembled a premolar crown, while the other resembled a



**Fig 2: Exposure of the odontome**



**Fig 3: Enucleated specimen**



**Fig 4: Uneventful healing**

molar crown which can be appreciated in the radiograph. This suggests that the epithelium of this lesion has the potential to form both tooth like structures (compound odontoma) and complex mass of dental tissue (complex odontoma).

Local trauma and infection have been suggested to be an etiologic factor for these lesions.<sup>4,5,10</sup> A genetic predisposition by inheritance, mutant gene or interference has also been suggested.<sup>4</sup> It arises from an exuberant proliferation of the dental lamina or its remnants and is termed laminar odontoma or forms as a result of multiple schizodontia i.e. a locally conditioned hyperactivity of dental lamina.<sup>3</sup> It may also be associated with the Gardner's syndrome of intestinal polyposis or the rare odontomadysphagia syndrome.<sup>3</sup>

Odontoma may occur at any age and any location in the maxillofacial region. They commonly occur in the first three decades of life. They are rarely seen in primary dentition and mostly observed with permanent dentition.<sup>6</sup> Complex odontomas have higher predilection in women (60%) compared to men.<sup>11</sup>

The most common location for compound odontomas is the anterior maxilla. There is general agreement that most cases of complex odontomas are found in the posterior mandible and that the second most common site is the anterior maxilla.<sup>2,12</sup> Compound odontomas are twice as commonly observed as the complex odontomas.<sup>13</sup> There have been reports of odontomas erupting into the oral cavity.<sup>11,14,15</sup> Almost all odontomas are located intraosseously, but they have occasionally been reported in extrosseous locations like the gingiva.<sup>7</sup> A rare case of an odontome occurring in the cranium near the pituitary gland has been reported by Faria et al, demonstrating that an odontogenic lesion may arise in brain tissues due to the embryological relationship between primordial stomodeum and Rathke's pouch.<sup>16</sup>

Most odontomas are asymptomatic and are observed during routine radiological examination, as in the present case.<sup>16</sup> Radiographical investigation thus plays an important role in detection of such asymptomatic lesions like odontomas, residual cysts etc. Occasionally, signs and symptoms relating to their presence and location are seen.<sup>4</sup>

The radiographic appearance of odontoma is almost always diagnostic. Complex odontomas appear as an irregular mass of calcified material surrounded by a narrow radiolucent band with a smooth outer periphery.<sup>2,4</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 dentin that is normal in appearance. There is a fibrous capsule and a small amount of supporting fibrous tissue. So-called ghost cell keratinization is occasionally seen in the enamel-forming cells of some odontomas.<sup>1,4,7,17</sup> Invaginated odontome results from invagination of part of the enamel organ into the crown of the developing tooth. The teeth may be grossly distorted or swollen, with a radiographic appearance of a tooth inside a tooth ('dens in dente').<sup>18</sup> A rare variety of tumor with overlapping histological features of both adenomatoid odontogenic tumor and complex odontoma has been reported.<sup>19</sup> An odontoameloblastoma is an extremely rare odontogenic tumor that contains an ameloblastomatous component together with odontoma-like elements.<sup>1,10</sup>

Odontomas can cause over retention, impaction and delayed eruption of dentition. A case of odontome associated with primary dentition in a 3-year-old was reported by John et al, the removal of which resulted in normal eruption of permanent dentition.<sup>20</sup> Evaluation of the extent of root development by radiographic examination during periodic observation is useful for establishing adequate occlusion after surgery and the use of orthodontic therapy after preservation of the impacted permanent tooth might lead to satisfactory postoperative occlusion.<sup>10,15,21</sup>

Despite the size of the lesion, there is usually no resorption of adjacent teeth.<sup>3</sup> However large odontomas can show facial disfigurement. A case of huge odontomas extending from both the ascending rami of the mandible and both

tuberosities in the maxilla causing gross facial deformity has been reported.<sup>9</sup>

As a result of the odontogenic nature, including epithelial and mesenchymal tissue, odontomas can develop cystic transformation into dentigerous cyst. This cyst results from the cystic degeneration of enamel organ after partial or total development of the crown, cystic transformation of the follicle associated with the unerupted tooth may also occur when its eruption is impeded by the odontoma.<sup>13</sup> The odontomas are well encapsulated and recurrence is usually not observed if the lining epithelium is removed intact.<sup>3</sup> Large complex odontomas should be cut into segments for removal, in order to conserve normal bone and to prevent jaw fracture that can result if excessive elevative force is applied in areas of the lesion that lack encapsulation and may be fused to surrounding bone<sup>22</sup>; a technique which was used in our case also. If portions of the lesion are left unexcised, such residual odontomas remain unchanged throughout the years in studies.<sup>17</sup> Casap et al in 2006 have described a case of a large odontoma in mandibular ramus region which was removed using sagittal split technique.<sup>8</sup>

Timely detection and surgical enucleation of odontoma followed by curettage is recommended to prevent complications such as tooth loss, cystic changes, bone expansion and delayed eruption of permanent teeth.<sup>20</sup> Since asymptomatic lesions (generally with no associated pain) like odontomas, radicular cysts etc are usually detected in radiographs only; the importance of routine radiographic examination cannot be over emphasized. Prompt clinical decision making and treatment (usually in the form of surgical enucleation) is necessary. Although recurrences do not develop, since the epithelium attached to such structures has potential to proliferate and form dental tissues, it is necessary to completely enucleate the lesion with its lining.

## References:

1. Regezi JA, Sciubba JJ, Jordan RC. Odontogenic Tumors. In, Penny Rudolf (ed). Oral Pathology, Clinical Pathologic



- Correlations, 4<sup>th</sup> edition. Missouri, Saunders 2003; 286-8.
2. Neville BW, Damm DD, Allen C, Bouquot JE. Odontogenic Tumors. In, Ellen Forest. Oral and Maxillofacial Pathology, 2<sup>nd</sup> edition. Philadelphia, Saunders 2002; 631-2.
  3. Sharma U, Sharma R, Gulati A, Yadav R, Gauba K. Compound composite odontoma with unusual number of denticles – A rare entity. The Saudi Dental Journal 2010; 22:145-9.
  4. Shafer WG, Hine MK, Levy BM. Odontogenic Tumors. In, Rajendra R (ed). A textbook of oral pathology, 6<sup>th</sup> edition. Noida, Elsevier, 2009; 287-90.
  5. Iwamoto O, Harada H, Kusukawa J, Kameyama T. Multiple Odontomas of the Mandible - A Case Report. J Oral Maxillofac Surg 1999; 57:338-41.
  6. Cohen DM, Bhattacharyya I. Ameloblastic fibroma, ameloblastic fibro-odontoma, and odontoma. Oral Maxillofac Surg Clin North Am 2004; 16:375–84.
  7. Ledesma-Montes C, Perez-Bache A, Garcés-Ortiz M. Gingival compound odontoma. Int J Oral Maxillofac Surg. 1996; 25:296-7.
  8. Casap N, Zeltser R, Abu-Tair J, Shteyer A: Removal of a Large Odontoma by Sagittal Split Osteotomy. J Oral Maxillofac Surg 2006; 64:1833-6.
  9. Ajike SO, Adekeye EO. Multiple odontomas in the facial bones. A case report. Int J Oral Maxillofac Surg. 2000; 29:443-4.
  10. Oliveira BH, Campos V, Marçal S. Compound odontoma – Diagnosis and treatment: three case reports. Pediatr Dent. 2001; 23(2):151-7.
  11. Kaneko M, Fukuda M, Sano T, Ohnishi T, Hosokawa Y, Hokkaido. Microradiographic and microscopic investigation of a rare case of complex odontoma. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 1998; 85:131-4.
  12. Philipsen HP, Reichart PA, Praetorius F. Mixed Odontogenic Tumours and Odontomas. Considerations on Interrelationship. Review of the Literature and Presentation of 134 New Cases of Odontomas. Oral Oncology 1997; 33(2):86-99.
  13. Shah A, Singh M, Chowdhury S. Complex Odontoma associated with dentigerous cyst. Int Journal of Clinical Dental Sciences 2010; 1:89-92.
  14. Serra-Serra G, Berini -Aytes L, Gay-Escoda C. Erupted odontomas - A report of three cases and review of the literature. Med Oral Patol Oral Cir Bucal 2009; 6:299-303.
  15. Shekar SE, Rao RS, Gunasheela B, Supriya N. Erupted compound odontome. J Oral Maxillofac Pathol 2009; 13(1):47-50.
  16. Faria PR, Cardoso SV, Rocha A, Gomes DC, Castro SC, Loyola AM. Intracranial compound odontome. J Craniomaxillofac Surg 2009; 37:376-9.
  17. Marx RE, Stern D. Odontogenic Tumors – Hamartomas and Neoplasms. In, Bywaters L. Oral And Maxillofacial Pathology. Hong Kong, Quintessence Publishing Co, Inc, 2003; 1:637-8.
  18. Hunter K D, Craig C. Pathology of the teeth. Diagnostic Histopathology 2009; 15:286-95.
  19. Tajima Y, Sakamoto E, Yamamoto Y. Odontogenic cyst giving rise to an adenomatoid odontogenic tumor - report of a case with peculiar features. J Oral Maxillofac Surg 1992; 50:190-3.
  20. John J B, John R R, Punithavathy I, Elango I. Compound Odontoma Associated with Maxillary Primary Tooth – A Case Report. Journal of Indian academy of dental specialists 2010; 1:49-51.
  21. Kamakura S, Matsui K, Katou F, Shirai N, Kochi S, Motegi K: Surgical and orthodontic management of compound odontoma without removal of the impacted permanent tooth. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2002; 94:540-2.
  22. Fonseca RJ. Odontogenic Tumors - Surgical pathology and Management. In, Williams TP, Stewart JC. Oral and Maxillofacial Surgery. Philadelphia, Saunders, 2000; 1:379-81.

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