CASE REPORT

Compound odontoma causing impaction of permanent maxillary incisors with associated ghost cell keratinization: A case report

K. M. Parveen Reddy1, N. H. Praveen Kumar1, Santosh Hunasgi2, Anila Koneru2, R. Surekha2, M. Vardendra2

1Department of Pedodontics and Preventive Dentistry, Navodaya Dental College, Raichur, Karnataka, India, 2Department of Oral and Maxillofacial Pathology, Navodaya Dental College, Raichur, Karnataka, India

Abstract

Many times compound odontomas are found associated with unerupted teeth. The canines, followed by maxillary central incisors and third molars are the major teeth which are impacted by odontomas. Herewith, this paper reports a case of compound odontoma associated with impacted permanent right maxillary central and lateral incisors. An 11-year-old girl reported with a chief complaint of retained primary tooth. Intraoral examination revealed that primary maxillary right central and lateral incisors were retained while permanent maxillary left central and lateral incisors were erupted and well accommodated. A non-specific swelling was there on labial aspect of 51 and 52 tooth region, which was measuring about 0.5 cm × 1 cm, enlarging mesiodistally from distal aspect of permanent left central incisor tooth to distal aspect of over retained right primary lateral incisor. Digital orthopantomograph showed calcified masses in the form of tooth-like structures present above the root apex and distal aspect of 51 and 52, causing root resorption. On the source of the past, clinical and radiographic assessment a final opinion of compound odontoma was made.

Keywords

Compound odontoma, ghost cells, incisors, maxillary

Introduction

Odontoma is defined as calcifying benign odontogenic tumor composed of various tooth tissues such as enamel, dentin, pulp, and cementum and representing the second most common odontogenic tumor of the jaw bones.[1] These are also considered to be developmental anomalies consequential from the growth of entirely differentiated epithelial and mesenchymal cells that confers to ameloblasts and odontoblasts.[2]

The etiology is not obvious, even though local trauma, genetic factors, and infection have been recommended as possible causes.[3] The pathogenesis of odontomas is thought to be associated with trauma during development of primary dentition, hereditary anomalies (Gardner’s syndrome, Hermann’s syndrome, basal cell nevus syndrome), odontoblastic hyperactivity or alterations of the genetic mechanisms accountable for scheming dental growth.[4] Hitchin recommended that odontomas are moreover inherited or owing to an altered gene or intervention with genetic control of tooth growth postnatally. Heredity is a probable issue, and constant lamina might be the hidden hereditary developmental anomaly. Further, it was reported that the investigational production of such type of lesion in rat caused by traumatic damage.[5]

According to WHO’s histological classification of odontogenic tumors of the oral cavity, there are two recognized histological types of odontomes: Compound odontoma and complex odontoma. Compound odontoma appears as numerous, sometimes hundreds of small teeth while complex odontoma appears as a single amorphous mass enclosed in a fibrous capsule.[6] Compound odontomas might be diagnosed at some age however they are frequently detected for the duration of the first two decades of life. Many times compound odontomas are found associated with unerupted teeth. The canines, followed by maxillary central incisors and third molars are the most periodic teeth impacted with odontomas.[6] Herewith, this paper reports a case of compound odontoma associated with impacted permanent right maxillary central and lateral incisors.

Case Report

An 11-year-old girl reported at Department of Pedodontics, Navodaya Dental College and Hospital, Raichur with a chief
Reddy, et al. Compound odontoma causing impaction of permanent teeth

Fig 173 graph

Figure 1: (a) Clinical photograph showing retention of primary right central and lateral incisors, (b) clinical photograph showing reflected mucoperiosteum and exposed calcified mass, (c) follow-up photograph showing no signs of recurrence

Reddy, et al. Compound odontoma causing impaction of permanent teeth

Journal of Advanced Clinical & Research Insights ● Vol. 2:4 ● Jul-Aug 2015 173
sheath with a allocation of dental hard tissues analogous to that originate in a tooth, (2) particulate type - Collected with two or more split masses of particles bearing no macroscopic similarity to tooth and consisting of firm dental tissues abnormally set, (3) denticulo particulate type – within this category, denticles and conglomerate areas are there side by side.\[^7\]

Radiographically, odontomas present as a well-defined, frequently unilocular lesion, which enclose several radiopaque, miniature tooth-like structures recognized as denticles located in the bone, except with a density that is superior than bone and equal to or better than that of a tooth. Radiolucent halo, classically bordered by a slight sclerotic line, backdrops the radiopacity. They are discovered on radiographs either incidentally or in search of a cause for a missing tooth.\[^8,10\] The present case also showed radio-opaque calcified masses in the form of tooth-like structures present over the root apex and to the distal aspect of 51 and 52, causing root resorption.

Microscopic features of complex odontoma contain all mature elements of dental structure: Dentin, dentinoid, enamel, enamel matrix, pulp tissue, and cementum. These are laid down in an organized fashion, which has a resemblance of normal tooth arrangement. The mass of hard dental structure is surrounded by a free, myxoid connective tissue through odontogenic epithelial cell rests which represents normal dental follicular tissue. Immature odontomas have little hard tissue formation, consisting of weak pulp tissues, dentin, and enamel matrix.\[^11\] Similarly, the present case also showed enamel, dentin and pulp in myxoid connective tissue stroma.

Ghost cell keratinization is infrequently seen in the enamel forming cells of a few odontomas. Surrounding hard tissue which gets calcified leads to reduced oxygen supply by walling-off effect which in turn leads to metaplastic transformation of odontogenic epithelium leading to cell death and keratinization.\[^8\] Few areas of ghost cell keratinization within the enamel matrix were seen in this present case also.

Odontomas are treated by traditional surgical elimination, and there is small likelihood of recurrence. It has been recommended that all specimens ought to be analyzed by an oral pathologist for histopathologic assessment. Appropriate patient care must include cautious clinical and radiological follow-up. When odontomas are associated with unerupted teeth, orthodontic traction of the impacted tooth almost immediately subsequent to removal of the lesion might be desired.\[^12\] Similarly in the present case surgical removal of odontoma was done. Further the possibility of spontaneous eruption of permanent incisors after removal of odontoma cannot be ruled out; so it was decided to keep the patient under periodic observation for next 12 months, before any active orthodontic intervention.

Odontomas are habitually related with complications such as impaction, malpositioning, aplasia and devitalization of

---

**Figure 2:** (a) Intraoral periapical radiograph of maxillary right front region showing tooth-like structures and causing root resorption of 51 and 52, (b) pre-operative panoramic radiograph showing multiple radio-opaque masses in the periapical tooth region of 51 and 52, (c) follow-up post-operative panoramic radiograph showing no signs of recurrence.

**Figure 3:** The excised gross specimen showing multiple tooth-like denticles along with extracted 51 and 52 primary teeth.

**Figure 4:** (a) Hematoxylin and eosin stained decalcified section showing hematoxophilic areas resembling enamel matrix (×200), (b) eosinophilic areas with dentinal tubules resembling dentin (×200) and (c) hematoxylin and eosin stained decalcified section showing enamel matrix with areas of ghost cell keratinization (×200).
adjoining teeth. As a result of the odontogenic nature, including epithelial and mesenchymal tissue, odontomas can lead to 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. Appropriate discovery and surgical enucleation of odontoma followed by curettage is suggested to avoid complications such as tooth loss, cystic changes, bone expansion and delayed eruption of permanent teeth.\[8\]

**Conclusion**

Diagnosis of odontomas is apparently associated with age and location. Therefore, lesions from incisor locations are diagnosed and treated at an earlier age than those from the canine or third molar regions. Odontomas are more common associated with impacted teeth and rarely erupt into the oral cavity and can even give rise to inflammation, pain, infection and malocclusion when they erupt into the oral cavity. Therefore, early detection and treatment of odontomas could increase the possibility of preservation of the impacted permanent teeth. Thus, this paper highlights the complications of an odontoma as a probable source of over preservation of a primary tooth, as well as impaction of permanent incisors.

**References**

1. Avelar RL, Primo BT, Pinheiro–Nogueira CB, Studart–Soares EC, de Oliveira RB, Romulo de Medeiros J, et al. Worldwide incidence of odontogenic tumors. J Craniofac Surg 2011;22:2118-23.
2. Neville BW, Damm DD, Allen CM, Bouquot JE. Oral and Maxillofacial Pathology. Philadelphia: Saunders; 1995. p. 531-3.
3. Jadav RK, Kumar N, Katarkar A, Ray JG, Chaudhuri K. A rare case of large complex odontoma. J Case Rep 2014;4:467-70.
4. Iatrou I, Vardas E, Theologie-Lygidakis N, Leventis M. A retrospective analysis of the characteristics, treatment and follow-up of 26 odontomas in Greek children. J Oral Sci 2010;52:439-47.
5. Kannan KS, Prabhakar R, Saravanan R, Karthikeyan, Rajvikram. Composite compound odontoma-A case report. J Clin Diagn Res 2013;7:2406-7.
6. Bharadwaj P, Hafiz A, Paikatt J, Sain S, Kaushik PC. Compound odontoma impacting maxillary central incisors in a 9 year old patient. J Dent Panacea 2014;1:112-8.
7. John JB, John RR, Punithavathy, Elango I. Compound odontoma associated with maxillary primary tooth – A case report. JIADS 2010;1:49-51.
8. Choudhary PJ, Gharote HP, Hegde K, Gangwal P. Compound odontoma associated with impacted teeth: A case report. IJSS Case Rep Rev 2014;1:12-5.
9. Shetty RM, Halawar S, Reddy H, Rath S, Shetty S, Deoghare A. Complex odontome associated with maxillary impacted permanent central incisor: A case report. Int J Clin Pediatr Dent 2013;6:58-61.
10. Singh SJ, Prerna, Uditi. Compound odontome associated with an unerupted permanent lateral incisor. Indian J Dent Sci 2009;1:9-14.
11. Santos PP, Barroso KM, Souza LB, Miguel MD, Silveira EJ. Odontomas: Clinicopathologic study of 104 cases and a case report of compound odontoma associated in an unerupted maxillary central incisor in a child. Int Dent Afr 2012;1:32-9.
12. Mathew A, Shenai P, Chatra L, Veena K, Rao P, Prabhu R. Compound odontoma in deciduous dentition. Ann Med Health Sci Res 2013;3:285-7.

**How to cite this article:** Reddy KMP, Kumar NHP, Hunasgi S, Koneru A, Surekha R, Vardendra M. Compound odontoma causing impaction of permanent maxillary incisors with associated ghost cell keratinization: A case report. J Adv Clin Res Insights 2015;2:172-175.