Compound composite odontome erupting into the oral cavity: A rare entity

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Abstract

Odontomas are the most common odontogenic tumors. They are usually asymptomatic and are often discovered during routine radiography. Eruption of an odontome into the oral cavity is rare. Odontomas are the most common odontogenic tumors. They are usually asymptomatic and are often discovered during routine radiography. Eruption of an odontome into the oral cavity is rare. We report an unusual case of erupting compound composite odontoma. we report an unusual case of erupting compound composite odontoma.

Keywords: Compound odontome, erupted, odontogenic tumor, palate

Introduction

The term odontome by definition alone refers to a tumor of odontogenic origin. In a broad sense, it means a growth with both the epithelial and mesenchymal components exhibiting complete differentiation, with the result that functional ameloblasts and odontoblasts form enamel and dentin. This enamel and dentin were usually laid down in an abnormal pattern because the organization of odontogenic cells failed to reach the normal state of morphodifferentiation.[1]

The term “odontoma” was coined by Paul Broca in 1867. Broca defined the term as tumors formed by the overgrowth or transitory of complete dental tissue.[2] Most of the odontomes are asymptomatic, although occasionally signs and symptoms relating to their presence do occur. These generally consist of unerupted or impacted teeth, retained deciduous teeth, swelling, and evidence of infection.[1] The World Health Organization defines odontomas as being of two types: complex and compound odontomas.[3] Odontomas are also classified as intraosseous and extraosseous odontomas.[4] Here, we report an interesting case of Here, we report an interesting case of compound composite odontome having tendency to exfoliate, compound composite odontome having the tendency to exfoliate.

Case Report

A 21-year-old female patient reported to the Department of Oral Medicine and Radiology, with the chief complaint of hard structure inside the oral cavity, located on the posterior part of her palate. She was apparently healthy and was asymptomatic. Her past dental and medical history was not significant.

Intraoral examination revealed a white colored tooth-like structure erupting into the oral cavity. It was located adjacent to 15 region, 1 cm toward the hard palate [Figure 1]. It was approximately 0.8 × 0.5 cm in diameter, showing a lobulated surface. Surrounding mucosa was apparently normal and there were no signs of inflammation, pain or infection, or erythema or ulceration. On palpation it was bony hard in consistency.

Maxillary occlusal radiograph revealed an abnormal single

Figure 1: Clinical photograph showing the odontoma erupting into the oral cavity
radiopaque structure [Figure 2]. A clinical diagnosis of an odontome was made.

This structure was extracted and it showed no morphological resemblance to any tooth of the normal series. It measured about 0.9 × 0.7 cm in diameter and 1 cm apico-incisally having two roots [Figure 3]. After extraction the specimen was sent for histopathological examination, which was confirmed to be a compound odontoma, having a thin layer of enamel, dentin, and pulp tissue almost in the same order of arrangement as that of a normal tooth.

**Discussion**

Odontomas are the most common type of odontogenic tumor and they constitute 22% of all odontogenic tumors of the jaws.[5,6] Some authors prefer to refer to it as hamartoma, not a true tumor. [7] Paul Broca in 1867 first used the term “odontome.”[2]

In 1914, Gabell, James, and Payne grouped odontome according to their developmental origin: epithelial, composite (epithelial and mesodermal), and connective tissue.

In 1946, Thoma and Goldman formulated a classification.[8]

- Gminated composite odontomes: Two or more, more-or-less well-developed teeth fused together.
- Compound composite odontomes: Made up of more-or-less rudimentary teeth.
- Complex composite odontomes: Calcified structure, which bears no great resemblance to the normal anatomical arrangement of dental tissues.
- Dilated odontomes: The crown or root part of tooth shows marked enlargement.
- Cystic odontomes: An odontome that is normally encapsulated by fibrous connective tissue in a cyst or in the wall of a cyst.

According to WHO classification odontomes can be divided into three groups.[9]

- Complex odontome: When the calcified dental tissues are simply arranged in an irregular mass bearing no morphologic similarity to rudimentary teeth.
- Compound odontome: Composed of all odontogenic tissues in an orderly pattern that result in many teeth-like structures, but without morphologic resemblance to normal teeth.
- 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 odontome.

A new type known as hybrid odontome is also reported by some authors.[10]

Odontomas are also classified as intraosseous and extraosseous odontomas. The intraosseous odontomas occur inside the bone and may erupt into the oral cavity (erupted odontoma). The extraosseous or peripheral odontomas are odontomas occurring in the soft tissue covering the tooth bearing portions of the jaws, having a tendency to exfoliate.[4,11]

They may be discovered at any age, although less than 10% are found in patients over 40 years of age. Although they are commonly asymptomatic, clinical indicators of odontoma may include retention of deciduous teeth, non-eruption of permanent teeth, pain, expansion of the cortical bone and tooth displacement. Other symptoms include paresthesia and swelling. Complex odontomas tend to occur in the posterior region of the jaw, and compound odontomas are more common in the anterior maxilla.[4]

Etiologies of odontome formation are numerous. Odontomas have been associated with trauma during primary dentition,
as well as with inflammatory and infectious processes, hereditary anomalies (Gardner syndrome, Hermann’s syndrome), odontoblastic hyperactivity and alterations in the genetic components responsible for controlling dental development.[12]

Hitchin suggested that odontomas are inherited through a mutant gene or interference, possibly postnatal, with genetic control of tooth development. In humans, there is a tendency for the lamina between the tooth germ to disintegrate into clumps of cells. The persistence of a portion of lamina may be an important factor in the etiology of complex or compound odontomas and either of these may occur instead of a tooth. In either case, a mutation in the epithelial cells of the persistent lamina or of the tooth germ itself may change the inherent capacity of the odontogenic epithelium to go through the cap and bell stages necessary for tooth formation and still retain its ability to stimulate mesenchymal differentiation necessary for hard tissue formation and to form functional ameloblasts and odontoblasts leading to a composite odontoma.[13]

Comparative investigations of odontogenic cells in normally forming teeth and tumors showed that differentiation of both normal and abnormal odontogenic cells is accompanied by the expression of some common molecules. Furthermore, the genes present in normal mesenchymal cells were also found in odontogenic tumor epithelium. A plausible explanation for this is that the odontogenic tumor epithelial cells are recapitulating genetic programs expressed during normal odontogenesis, but the tumor cells demonstrate abnormal expression of these genes.[13]

The first case of an erupted odontoma was described in 1980 by Rumel et al. To the best of our knowledge, since then only 20 cases have been documented in the literature, except our case. Of these cases 12 (60%) are females and 7 (35%) are males. In one case patient, age and sex were not determined. The mean patient age was 25.35 years, thus confirming preferential presentation of these lesions between the second and third decades of life. Of the 20 reported cases of erupted odontoma, 9 corresponded to compound odontomas and 11 to complex odontomas.[13]

The mechanism of odontoma eruption appears to be different from tooth eruption because of the lack of periodontal ligament in odontoma. Therefore, the force required to move the odontoma is not linked to the contractility of the fibroblasts, as is the case for teeth. Although there is no root formation in odontoma, its increasing size may lead to the sequestration of the overlying bone and, hence, occlusal movement or eruption. An increase in the size of the odontoma over time produces a force sufficient to cause bone resorption.[4]

Another reason for odontoma eruption could be the bony remodeling of the jaws. However, for this to occur dental follicle is required, although indirectly, as it provides both the conductance and chemoattraction for the osteoclasts necessary for tooth eruption. Immunocytochemical investigations have indicated that a pattern of cellular activity involving both reduced dental epithelium and the follicles is associated with tooth eruption. The reduced dental epithelium initiates a cascade of intercellular signals by expressing epidermal growth factor β and transforming growth factor. These factors, in turn, stimulate the follicular cells to produce colony-stimulating factor, which recruits osteoclasts to the follicle. The reduced dental epithelium also secretes proteases, which assist in the breakdown of the follicle to produce a path of least resistance. The epithelial signaling could explain the remarkable consistency of eruption times, as it is likely that the dental epithelium is programmed as part of its functional life cycle.[16]

However, in the case of odontomas erupting into the oral cavity, the mechanism behind the eruption times remains uncertain as some odontomas erupt at a young age and others at an older age.[4] Erupted odontomas are most often seen in older people. Thus, it is likely that resorption of the edentulous part of the alveolar process plays a role, but it is also possible that reactive growth of the capsule contributes to this phenomenon.[17] Eruption at a young age is possible through bone remodeling that might have resulted from the presence of dental follicles.[4]

The treatment of choice is surgical removal of the lesion in all cases, followed by histopathological study to confirm the diagnosis.[18]

In the present case, the patient was 21-year-old, was asymptomatic, with the chief complaint of hard structure projecting from her palate. Based on the clinical, radiological, and histopathological findings, it was diagnosed as erupting compound composite odontome. This case needs to be differentiated from supplemental and supernumerary teeth. Supplemental tooth is the one that resembles a normal tooth both morphologically and histologically and is located adjacent to the normal tooth, whereas a supernumerary tooth is a tooth-like structure of variable size and shape. However, histologically it represents the normal organization of the tooth structure, such as enamel, dentin, pulp, and cementum, including the periodontal ligament.[19]

**Conclusion**

Odontomas are considered to be hamartomatous malformation rather than true neoplasm. Odontomas are considered to be hamartomatous malformation rather than true neoplasm. Eruption of an odontoma in the oral cavity is rare. A case of erupting compound composite odontome is presented, which was located on the palate and was extracted. Most often such cases are diagnosed as supplemental or supernumerary tooth
or vice versa and need to be differentiated.

References

1. Shafer. Hine and Levy: A Text Book of Oral Pathology; 4th ed. W.B. Saunders and Co 1993;308-12.
2. Batra P, Gupta S, Rajan K, Duggal R, Hariparkash. Odontomes - Diagnosis and Treatment: A 4 Case Report. J Pierre Fauchard Acad 2003;19:73-6.
3. Amailuk P, Grubor D. Erupted compound odontoma: Case report of a 15 year old Sudanese boy with a history of traditional dental mutilation. Br Dent J 2008;204:11-4.
4. Vengal M, Arora H, Ghosh S, Pai KM. Large erupting complex odontoma: A case report. J Can Dent Assoc 2007;73:169-72.
5. Amado CS, Gargallo AJ, Berini AL, Gay EC. Review of 61 cases of odontoma: Presentation of an erupted complex odontoma. Med Oral 2003;8:366-73.
6. Bhaskar SN. Odontogenic tumors of jaws in Synopsis of oral pathology. 7th ed. CBS Publishers and Distributers, Delhi; 1986. p. 292-303.
7. Cohen DM, Bhattacharya I. Ameloblastic fibroma, ameloblastic fibro-odontoma, and odontoma. Oral Maxillofac Surg Clin North Am 2004;16:375-84.
8. Thoma KM, Goldman HM. Oral Pathology. 5th ed. St Louis: The CV Mosby Company; 1960. p. 1221-2.
9. Kramer IR, Pindborg JJ, Shear M. Histological Typing of Odontogenic Tumour. WHO. International Histological Classification of Tumours. 2nd ed. Berlin Springer; 1992. p. 16-21.
10. Singh S, Singh M, Singh I, Khandelwal D. Compound composite odontome associated with an unerupted deciduous incisor - A rarity. J Indian Soc Pedod Prev Dent 2005;23:146-50.
11. Reichart PA, Philipsen HP. Odontogenic tumors and Allied lesions. London: Quintessence; 2004. p. 149-53.
12. Piattelli A, Perfetti G, Carrano A. Complex odontome as a periapical and interradicular radioopacity in a primary molar. J Endod 1996;22:561-3.
13. Hitchin AD. The aetiology of the calcified composite odontomes. Brit Dent J 1971;130:475-82.
14. Rumel A, de Fritas A, Birman E, Tannous L, Chacon P, Borkas S. Erupted complex odontoma. Report of a case. Dentomaxillofac Radiol 1980;9:5-9.
15. Serra-Serra G, Berini-Aytès L, Gay-Escoda C. Erupted odontomas: A report of three cases and review of the literature. Med Oral Patol Oral Cir Bucal 2009;14:E299-303.
16. Ten Cate AR, Nanci A. Physiologic tooth movements: Eruption and shedding. In: Nanci A, editor. Ten Cate’s oral histology: Development, structure and function. St. Louis (MO): Mosby; 2003. p. 275-98.
17. Ragalli CC, Ferreria JL, Blasco F. Large erupting complex odontoma. Int J Oral Maxillofac Surg 2000;29:373-4.
18. Philipsen H, Reichart P, Praetorius F. Mixed odontogenic tumours and odontomas. Considerations on interrelationship. Review of the literature and presentation of 134 new cases of odontomas. Oral Oncol 1997;32:86-99.
19. Shekar SE, Rao RS, Gunasheela B, Supriya N. Erupted compound odontome. J Oral Maxillofac Pathol 2009;13:47-50.

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