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A Massive Mixed Odontoma of Mandible – Case Report

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Abstract

An Odontomas are among the most prevalent benign odontogenic tumors. Odontomas cause delayed or uneven eruption of teeth, drawing the patient's attention or being found as an incidental finding. Although the prevalence of odontoma is quite common, they are confined to a smaller size. These tend to occur either as well-developed miniature tooth-like structures called the denticles or as a conglomerate homogenous mass. Rare encounters of both types of odontomas occurring together are described in the literature as another entity termed Mixed or complex-compound odontoma. Usually, odontoma arises from a single tooth follicle, although, countable reported cases have indicated the possibility of odontoma developing from multiple teeth. Here, a case of an enormously giant mixed odontoma affecting the entire right mandible with multiple missing teeth is presented. An emphasis on the incidence and etiopathogenesis of mixed types of odontoma is discussed.

Keywords: Odontoma, Odontogenic tumor, Denticles, Mixed odontoma, Complex-Compound

Introduction

The term odontoma is referred to an odontogenic tissue-derived benign tumor. Several cases of odontomas are well documented in the literature indicating that they are among the most frequently encountered odontogenic tumors. Such lesions were first reported as early as the 19th century and were labeled with different terms. Pierre Paul Brocca initially proposed a descriptive phase "hypergenese des elements dentaires", which means "hypergenesis of dental elements" before the term "odontoma" was coined. In essence, an odontoma is a grouping of irregularly arranged dental tissues, such as enamel, dentin, cementum, and occasionally pulp. WHO classified odontoma into a category of odontogenic tumors that are composed of odontogenic epithelium and ectomesenchyme with or without the formation of mineralized dental tissues. According to WHO 2005, odontomas were classified into complex and compound

types. Apart from these two types, some lesions may display characteristics of both compound and complex called "Mixed lesions" or "complex-compound odontomas". Only four case reports have been documented to date, indicating how uncommon these lesions are. Odontomas are typically confined to a size of 1-2cm, a larger size is regarded as uncommon. The case report of an unexpectedly large mixed odontoma is presented here.

Case Report

A 25 -year-old male patient was referred to our unit with a chief complaint of unerupted teeth in his lower right back teeth region. There was facial asymmetry with mild diffuse extraoral swelling on the right lower one-third of the face which on palpation was hard in consistency. Intraorally, the second premolar and molars were clinically missing and the buccal vestibule was completely obliterated. The vestibular mucosa, buccal to the third molar region had indentation of the maxillary teeth, and the alveolar ridge appeared irregular. Expanded cortical plates were observed both buccally and lingually.

Radiographically, an irregular radiopaque mass occupied the entire right side of the mandible, extending from the premolar region to the posterior border of the ramus. The mass appeared homogenous towards the posterior half whereas multiple lobule-like structures surrounded by a radiolucent rim were noted anteriorly. The entire mass was enclosed by a thin rim of radiolucency. Thinning of the inferior cortical bone was well appreciated with inferior displacement of the alveolar nerve canal. In addition, a CBCT scan was performed to verify the size, extent, and impact on the adjacent critical structures. A fairly well-demarcated irregular calcified mass with discernible enamel, dentin, and pulpal radiodensities that measured 6.77cm(L)*3.26cm(W)*5.24cm(H) was noted in the right mandible. Superior-inferiorly, the mass extends from the alveolar crest to the inferior border of the mandible occupying the premolar-molar region till the posterior border of ramus posteriorly. Multiple deformed tooth-like structures were evident within the lesion anteriorly. No clear distinction between the odontoma and a normal series of displaced teeth was appreciable. Bucco-lingual expansion caused thinning of the plates and expansion and thinning of the inferior border of the mandible was also observed. The mass displaced the inferior alveolar nerve canal inferiorly and lingually potentially causing compression and probable erosion of the canal at the contact area. These features matched the characteristics of a mixed odontoma. An incisional biopsy followed by histopathological confirmed the diagnosis. The patient is scheduled for the next phase of surgery after the initial surgical enucleation.

Discussion

Odontomas are the most prevalent benign tumor or hamartoma arising from the well-differentiated odontogenic epithelium and ectomesenchyme. It accounts for about 22% of all odontogenic tumors, of which compound and complex types are observed in 9-37% and 5-30 % of reported cases respectively. Mixed odontomas constituted about 2.5% of the cases reviewed. The incidence peaks in the second or third decade of life with no significant gender dimorphism have found a slight female predominance. Compared to the compound odontoma, which is more common in the anterior maxillary region, the complex type is more often observed in the posterior mandibular region, predominantly on the right side. Of the reported four cases of mixed-type odontoma, three were found to

occur in the left side maxilla. The present case discusses the incidence of mixed odontoma in a young male patient in his 2nd decade of age affecting the right side of the mandible. Even though there are several possible causes, the etiology of odontomas remains unclear. This could occur as a result of local trauma, pre-eruptive trauma, infection, or hereditary syndrome. These factors alter the genetic makeup and initiate the hyperactivity of odontoblasts. Hitchin proposed the genetic basis of pathogenesis as an inheritance of the gene, or mutation/interference of the gene that controls tooth development. This is the result of the failure of odontogenic cells to attain the ideal stage of morpho-differentiation and ultimately unable to achieve the typical tooth morphology and structure. It is frequently asymptomatic due to its benign nature, although it may cause retention of deciduous teeth, the non-eruption of permanent teeth due to obstruction of the eruptive trajectory, the expansion of cortical bone, tooth displacement, facial asymmetry, and malocclusion. In the presented case, the patient was concerned about the non-eruption of permanent teeth, but other aforementioned features were present. If an odontoma measures beyond three cm in size, it falls under a category called “Giant odontoma”. They typically arise from a single tooth follicle, which results in non-eruption and displacement of the tooth in question. However, the absence of one or more consecutive teeth is rarely observed, as in the case at hand. The present case is comparable to the case described in terms of large size and multiple associated missing teeth. In contrast, we discovered an unprecedented case of the largest mixed-type odontoma in the right posterior jaw. Every giant odontoma that has been documented is a complex type, which is represented by a uniform homogeneous radiopacity. In contrast, a compound odontoma is characterized by the presence of multiple radiopaque masses that resemble teeth and are surrounded by a radiolucent rim that indicates the dental follicle. The present case study highlights the co-occurrence of several tooth-like radiopaque masses in the anterior part of the lesion and a homogeneous radiopacity towards the ramus. These features highly suggest a mixed odontoma. In our opinion, the mixed nature of the lesion could be explained due to the association of multiple teeth raising the possibility of multiple gene involvement. The possibilities of other odontogenic tumors cannot be completely overlooked. The density of the mass becomes a crucial element in filtering numerous lesions occurring in the jaw. Given that the masses contain density resembling enamel it is less likely to originate from bone. It is rare for lesions like cemento-osseous dysplasia, Gigantiform cementoma, or cementoblastoma which are associated with a tooth root, to result in tooth impaction. Interference with the impacted and the tooth displaced to the peripheral border of the tumor also indicates an odontogenic origin. Other exclusively odontogenic calcifying tumors highly associated with impacted teeth are adenomatoid odontogenic tumor (AOT), calcifying epithelial odontogenic tumor (CEOT), ameloblastic fibro-odontoma (AFO), whose features superpose the characteristics of complex odontoma. AOT produced frequently small and less dense masses, whereas CEOT shows radiopacity within cyst-like radiolucency. AFO and AFD are now reclassified as developing odontomas, given the nature of the lesions which are difficult to differentiate. The detailed representation of the extent, defined tooth-like structures within the tumor, and the precise involvement of surrounding anatomical tissues

i.e., the possible erosion of the inferior alveolar canal was made possible by the use of CBCT. The 3D reconstruction showed a more comprehensive three-dimensional comprehension of the lesion which further aided in patient education and treatment planning. Secondary infection and pain are the reported consequences of odontoma. In this case study, despite the huge size and extensively displaced canal, only mild pain was noted. No other symptoms, such as numbness or paraesthesia, were reported. Relapses are uncommon in odontomas; nevertheless, they might occur in cases of inadequate resection and enucleation performed during the initial stage of calcification. The presented case was managed in phases, to completely remove the mass followed by prosthetic rehabilitation.

Conclusion

Odontomas, which are mostly discovered accidentally, are a common cause of non-eruption of teeth. They frequently confine themselves to smaller sizes and therefore, it is quite uncommon to detect a massive odontoma. This case features, what we believe is the largest mixed odontoma documented in the literature ever. Also, the rare involvement of multiple teeth could potentially be the cause for the occurrence of mixed-type of odontoma. This case also demonstrates that despite being benign and slowly expanding, it has the potential to develop substantially if ignored and if treatment is delayed. Early detection will perhaps result in a better management protocol.

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