Case Report

MedInform

DOI: 10.18044/MEDINFORM.2023102.1715

ISSUE 2, 2023

Compound Odontoma: A Case Report And Literature Review

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Abstract

Aim. The aim of this case report is to present the clinical case of a compound odontoma with an unusual location in the posterior region of the maxilla as well as to give a literature review on the causes of occurrence, diagnosis and treatment of compound odontomas.

Materials and methods. The study reports the clinical case of a compound odontoma occurring in the region of tooth #16 of the maxilla, which is considered a rare location in view of the clinical cases described in dental literature so far. The research on the literature review relied on Google Scholar and PubMed publications written in English and published after 2021.

Results. Odontomas are among the most common benign formations in the jaw bones. They are divided into two main types: compound odontomas and complex odontomas. Compound odontomas have predilection for the anterior maxilla, whereas complex odontomas typically occur in the posterior mandible. Distribution between the two sexes for both types of odontomas is approximately equal.

Conclusion. Odontomas are relatively common hamartoma formations and do not pose any diagnostic or surgical problems but should always be regarded as a potential cause for difficult eruption or impaction of teeth. Early diagnosis can prevent complications such as malocclusion, bite disorders as well as other functional or aesthetic disturbances.

Keywords: compound odontoma, hamartoma, impacted tooth

Introduction

Odontomas are the most common odontogenic tumors. They are perceived as hamartoma rather than a true neoplasm. Based on their composition and radiographic features, World Health Organization (WHO) classifies them in two types: compound odontoma, comprising multiple tooth-like structures, and complex odontoma, which appears as a disorganized amorphous mass of enamel, dentin and cementum, showing

no anatomical similarity to a tooth [1, 2, 3]. Odontomas are typically detected at a young age, i.e. in the first or second decade of life but they can rarely be diagnosed in adulthood as well. Clinical symptoms are sparse and non-specific, typically involving a delayed eruption or persistence of a permanent tooth or orthodontic anomalies.

According to some studies, odontomas present as abnormalities of dental origin, resulting from the growth of fully differentiated epithelial and mesenchymal cells, such as ameloblasts and odontoblasts [4]. These cells and tissues may resemble normal structures or appear underdeveloped. The levels of differentiation of odontogenic tissues and their arrangement in tooth-like structures determine if they will be classed as compound odontoma or complex odontoma [5, 6].

Case report

The case study involves an 8-year-old girl whose parents sought dental assistance at the Faculty of Dental Medicine, at the Medical University in Varna, Bulgaria. The intraoral examination revealed a missing first molar on the right side of the maxilla, long past its eruption time. The palpation diagnostic test showed a slight increase in the alveolar ridge in that area, without the presence of pain or inflammation. A subsequent OPG scan, however, indicated a malformation in the region of maxillary teeth #16 and #17, with increased inhomogeneous radiographic density and prominent margins. The imaging study showed that the germ of tooth #16 was found to be superior to the malformation. Despite its proximity to the maxillary sinus, there was no evidence of inflammation in it. The CBCT scan allowed for a more detailed examination, indicating the presence of tooth-like structures resembling teeth, arranged irregularly. The medical history of the patient revealed further subjective complaints. A preliminary diagnosis of a compound odontoma was made based on the medical history, clinical and radiographic data, and its surgical removal was advised. After an Informed Consent was signed by the parents, the surgical procedure was performed under general anesthesia. The surgical manipulation involved an elevation of a mucoperiosteal flap, exposure and excision of the odontoma and its tooth-like formations as well as its adjacent soft tissues, and conservation of the apically located tooth #16. The postoperative period was uneventful.

Fig. 1- Orthopantomography

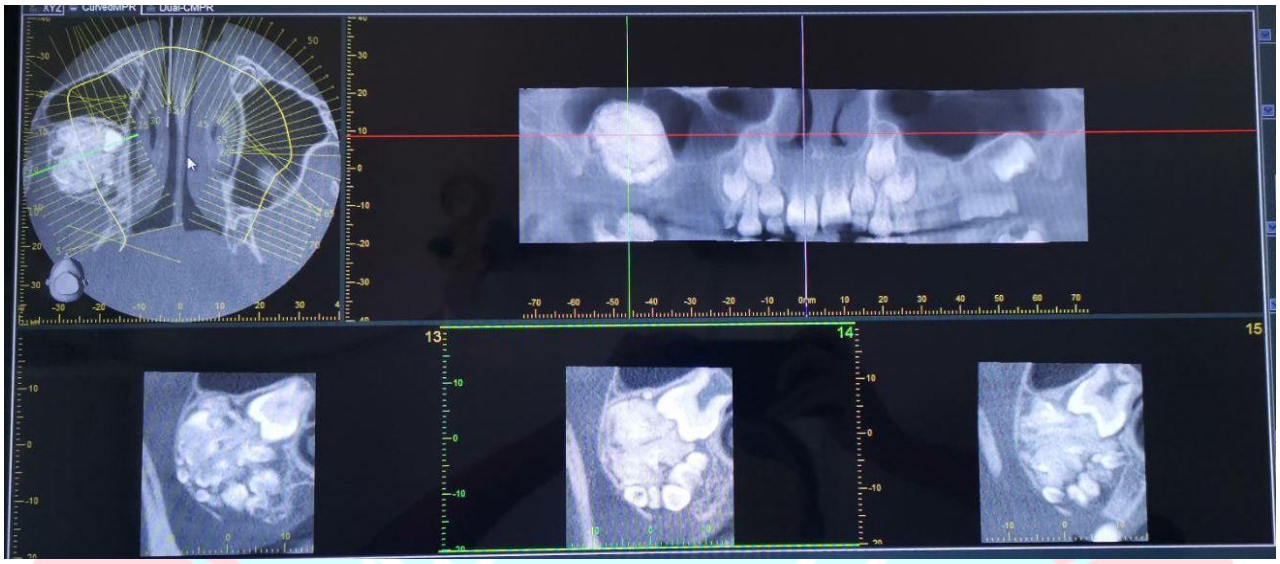

Fig. 2 - CBCT of the patient

Fig. 3 – Intraoperative view before removal of odontomas

Fig. 4 - Odontamas

The odontoma is not a rare phenomenon but what is interesting in this case is its unusual location, namely the posterior region of the upper jaw. Compound odontomas most commonly occur in the anterior parts of the maxilla (61%), whereas complex odontomas tend to develop in the posterior regions (59%) [7, 8, 9].

Discussion

Odontomas are the most common odontogenic tumors, accounting for 22% - 67% of all benign jaw bone tumors [1, 2, 10].

The term "odontoma" was introduced by Paul Broca in 1867 to describe "tumors formed by the overgrowth of transitory or complete dental tissues" [7]. According to WHO classification adopted in 1992, they are

divided into two main types: Compound odontomas and Complex odontomas based on their size, radiographic and histological features [11, 12]. They are typically associated with disturbances in permanent teeth eruption, malocclusion and other pathologies. In one third of the cases, patients were asymptomatic, however, complications with compound odontoma included the presence of pain (13.3%) and swelling (8.9%) [13]. Compound odontomas display rudimentary dental structures (multiple miniatures of rudimentary teeth), whereas Complex odontomas appear as a disorganized mass of dental tissues [10, 14, 15]. There are rare cases, reported in dental literature, of odontomas presenting features of both types simultaneously [15, 16].

Studies indicate that compound odontomas occur more often in the anterior part of the maxilla, in 67% - 81.8% of cases [5, 17, 18], whereas other researchers report them to have predilection for the anterior region of the mandible (55%). Complex odontomas are primarily detected in the posterior mandible and occur more frequently than compound odontomas. The two types of odontomas are distributed evenly among female and male patients [11, 12, 19].

On a radiography, compound odontomas appear as radiopacities with well-defined borders, surrounded by a thin radiolucent zone (radiolucent rim) corresponding to a connective tissue capsule around them, with multiple small teeth called denticles, located inside the lesion, separated by a fibrous septum [12, 20].

In most cases, these bone lesions are impacted into the bone without protruding it, although there are cases indicating swelling, mostly observed in cases of compound odontoma [1, 21]. The reason could possibly be the resorption of the alveolar ridge, bone remodeling and growth of the capsule surrounding the odontoma [14, 21]. Spontaneous eruption of odontomas in the oral cavity is very rarely observed [10].

The etiology is still not fully understood. Late diagnosis of complex odontomas and their more common location in the posterior mandible are linked to the terminal stage of the development of hamartomatous lesions, while the occurrence of compound odontomas may be due to ‘multiple schizodontia’, because of local hyperactivity of the dental lamina [22].

Their pathogenesis is also associated with trauma during the time of the temporary dentition, hereditary anomalies, infections, probably affecting the germ formation of permanent teeth [23]. Hereditary anomalies such as Gardner's syndrome, Hermann's syndrome, odontoblastic hyperactivity as well as alteration in genetic components are also considered among the causes of odontoma occurrences [9, 24]. A study shows that odontomas can prevent or delay the eruption of both permanent and temporary dentitions. The results indicate that due to the absence of dental tissue calcification, odontomas in primary dentition become radiolucent and are difficult to detect in radiographic examinations [25].

Another rare dental anomaly observed in compound odontoma is the so-called transmigration. It represents displacement of an unerupted tooth, most often a canine, towards the opposite side of the arch, and constitute 0.007 - 0.08% of the clinical cases described in scientific studies [26, 27)].

Differential diagnosis of odontomas is usually made with other ossifying bone lesions such as ossifying fibroma, odontoameloblastoma, ameloblastic fibroma, osteoma, fibrous dysplasia, etc. [6, 28].

The treatment of choice usually includes the surgical removal of odontomas. In some cases, when the compound odontoma is linked to an impacted tooth that can be conserved, postoperative follow-ups are performed for several months, after which, if not erupted, the impacted tooth is exposed and extruded orthodontically [29]. If the impacted tooth cannot be extruded, as was the case in the clinical study, the next step is to extract it along with the odontoma. By all means, conservative enucleation remains the chosen treatment plan. After their removal, no complications or recurrences are usually observed. A case of recurrence is also reported, which is extremely rare [30].

Conclusion

In conclusion, it can be said that odontomas are not uncommon hamartoma formations and do not pose a diagnostic or surgical problems, but should always be considered as a potential cause for difficult eruption or impaction of teeth. Early diagnosis can prevent complications such as malocclusion, bite disorders as well as other functional or aesthetic disturbances.

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Dzhongova E, Petrova I. Compound Odontoma: A Case Report And Literature Review. Medinform 2023; 10(2):1715-1720.