

CASE REPORT

Compound odontoma – morphology, clinical findings and treatment. Case report

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Abstract

Compound odontomas are benign tumors, composed of odontogenic tissue that has an orderly pattern. These are formed of unilocular conglomerate of multiple calcified structures, some resembling to mini-teeth. A case of a 9-year-old female patient with compound odontoma is reported, highlighting aspects of odontoma's morphology, clinical findings and treatment. The tumor, found in the anterior maxilla, included multiple calcified structures, some of them resembling to mini-teeth (the biggest were about 5 mm), arranged in a conglomerate. The mini-teeth presented a crown and root, different dental tissues, open apices (the root was incompletely formed), and root canal which was evidenced by usage of Kerr K-file needle No. 8. Their surface presented many irregularities. Odontoma associated impaction of maxillary central incisor, and eruption disturbances and malposition of adjacent teeth. In order to minimize side effects, especially when odontoma is localized in an area with great impact on facial esthetics, early diagnosis and proper treatment are of great importance.

Keywords: compound odontoma, morphology, supernumerary teeth, impacted tooth, orthodontics.

Introduction

Odontomas are tumors of odontogenic origin, which shows completely differentiated epithelial and mesenchymal cells [1]. Tooth structures are found, *i.e.*, enamel and dentine, and sometimes cement and pulp tissue [2], in varying proportions and degrees of development [3]. By *World Health Organization* (WHO) odontomas are of several type: ameloblastic fibro-odontoma, odontameloblastoma, complex odontoma, and compound odontoma [1, 4].

The compound odontoma is a type of benign tumor, formed of odontogenic tissue that has an orderly pattern [1]. It consists of unilocular conglomerate of multiple tooth like structures, describe sometimes as being mini-teeth. This tumor is considered by some specialists to be included in the category of supernumerary teeth [3]. The etiology of the odontoma is unknown, but some association is suspected to trauma of deciduous teeth, inflammatory and infectious processes, hereditary anomalies and genetic mutations [3, 5]. Compound odontomas can be localized anywhere in the dental arches, but most frequently are found in the anterior region of the maxilla [2]. This lesion is usually asymptomatic and shows a slow and painless growth [6]. Bone expansion is observed in an important part of the cases [7]. Also, other common signs are over-retention of deciduous teeth, impacted permanent teeth and sometimes malposition of adjacent teeth [2]. It is usually discovered in relation to a missing teeth, or by routine radiography [2, 5]. The radiographic aspect of odontoma is characteristic, *i.e.*, a radiopaque mass suggestive for multiple small calcified structure that resemble to mini-teeth, surrounded by a radiolucent zone [2, 8]. Odontomas are treated by surgical removal and if needed with

additional dental treatment for the associated sides effects or complications, *e.g.*, orthodontic traction for included tooth. Generally, odontomas are painless and non-aggressive lesions, after excision showing a positive evolution, without relapse [5]. Recurrence is very rare but can occur, for example if odontoma was removed in the early stages of its formation [9]. Infrequently has been presented odontomas erupting in the mouth, generally spontaneously but sometimes being linked to factors as history of traumatic injury in its area [10–12].

Study aim was to report of a case of a patient with compound odontoma, which caused impaction of central incisor and malposition of neighboring teeth, it being presented with clinical, radiological and microscopic evaluation, as morphology assessment, clinical findings and treatment progress.

Case presentation

S.C., a 9-year-old female patient, was referred to the orthodontist in 2015, due to the lack of eruption of permanent left central incisor. Personal and family history was non-contributory. Neither the patient nor her parents could recall any history of pain, trauma or other phenomena in that anterior part of the maxilla, at the deciduous or permanent teeth. Also, the parents or her older sibling did not have any odontogenic tumor.

At the intraoral examination (Figure 1), there was observed that the patient had a mixed dentition with the over-retention of left deciduous maxillary incisors, the absence of permanent left central incisor, the ectopically erupted permanent left lateral incisor (palatally displaced, in crossbite, with risk of transposition with left permanent canine), and the relatively normal eruption of permanent

right maxillary incisors. On the left side of the anterior part of the maxilla there were identified a palatal and a vestibular bulge, detectable mainly through palpation.



Figure 1 – (a and b) Clinical aspect at initial examination – on the left maxillary side, where odontoma was locate, there were identified eruption disturbances and malposition of neighboring teeth.

The radiographic examination (Figure 2) revealed the presence of a lesion in the left premaxilla, and the impacted left permanent central incisor, localized apical to it. The radiographic aspect of the lesion was characteristic for compound odontoma. It had an uninformed radiopaque aspect, with multiple radiodense areas, some resembling anatomically to mini-teeth, included in a well delimited radiolucent lesion. It was located between deciduous left incisors and permanent left central incisor. According to the radiographs, the vestibular bulge corresponded to the compound odontoma, and the palatal bulge to the included permanent left central incisor. The deciduous maxillary incisors showed an atypically pattern of root resumption that may be linked to odontoma presence – more pronounced on the root surfaces in the proximity of it. Also, permanent teeth on the side of the maxilla where odontoma was present had an atypical eruption direction, being probably displaced by the tumor (incisors were displaced palatally, and by the eruptive trajectory of permanent left canine and the position of left lateral incisor there was a risk of transposition).

Considering the clinical and radiological findings, a preliminary diagnosis of compound odontoma was made. Sometimes in case of compound odontoma a differential diagnosis is made with a supernumerary tooth. Treatment plan included removal of the tumor, extraction of deciduous left incisors, and orthodontic treatment for correction of malocclusion, including orthodontic traction of the included permanent central incisor.

A removable maxillary orthodontic appliance was made that included elements for correction of overbite, for correction of permanent left lateral incisor malposition, and for traction of included permanent central incisor. This type of orthodontic appliance was preferred considering the patient had a moderate risk of caries, lived far from

the dental office (in another town) and specified that was difficult to attend short-interval dental appointments. The patient showed a good compliance with this treatment alternative.

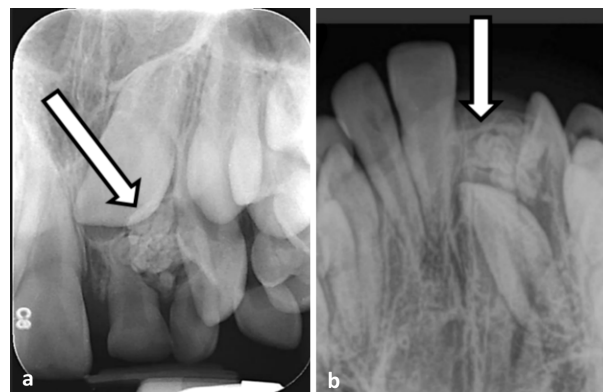


Figure 2 – (a and b) Radiographic aspect of compound odontoma on periapical and occlusal radiographs (maximum diameter of about 10 mm).

Afterwards, removal of odontoma was done by surgical excision of the tumor, under local anesthesia. The preliminary diagnosis was confirmed, as the lesion contained a conglomerate of numerous small teeth-like structures. On the impacted maxillary central incisor, an attachment was bonded for orthodontic traction to the maxillary removable orthodontic appliance (Figure 3).

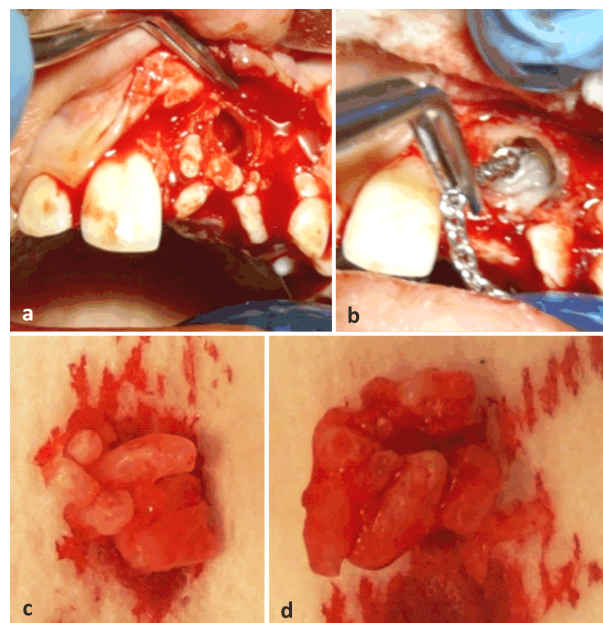


Figure 3 – (a–d) Odontoma's surgical excision (conglomerate of small calcified structures was identified) and bonding of an attachment on left central incisor for orthodontic traction.

The compound odontoma was morphologically analyzed, macroscopic and by optical microscopic examination (OPMI Pico; Carl Zeiss). It presented small-calcified structure, the bigger ones resembling to mini-teeth, arranged in a conglomerate. The morphology of the mini-teeth was rather similar with the normal teeth, but were considerably smaller (the biggest mini-teeth identified had length of about 5 mm). Regarding their shape, generally were identified monoradicular teeth, conical, fairly straight or slightly angulated. Microscopically, the aspect was

suggestive to mini-tooth like structure. They presented a crown and root, had open apices (the root was incompletely formed), and had root canal which was evidenced by usage of Kerr K-file needle No. 8. The dental tissues, enamel, dentine and cement were identified. The teeth surface presented many irregularities, with enamel lacunas (Figure 4).

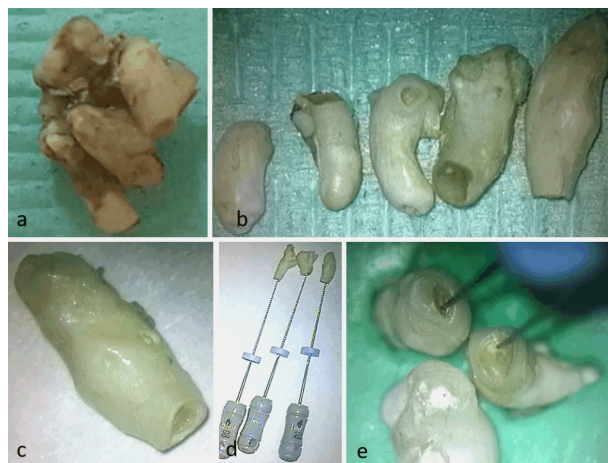


Figure 4 – Compound odontoma's morphology: (a) Conglomerate of calcified structures; (b) Calcified structures resembling to mini-teeth; (c) Mini-teeth with irregularities on its surface, with incomplete root formation, different dental tissue being identified; (d and e) Highlighting the root canal of mini-teeth by Kerr K-file needle No. 8.

During follow-up, the evolution was good. Even so, the impacted central incisor came very slowly, nearly the same for each activation (approximately a chain link), regardless the time-span during dental visits, which vary a lot, sometimes of two months. Also, malposition of the maxillary incisors and canine on the side where odontoma was localized was more severe compared to the right side. Also, in the end of the treatment the left maxillary central incisor will probably need esthetic gingival recontouring (Figure 5).

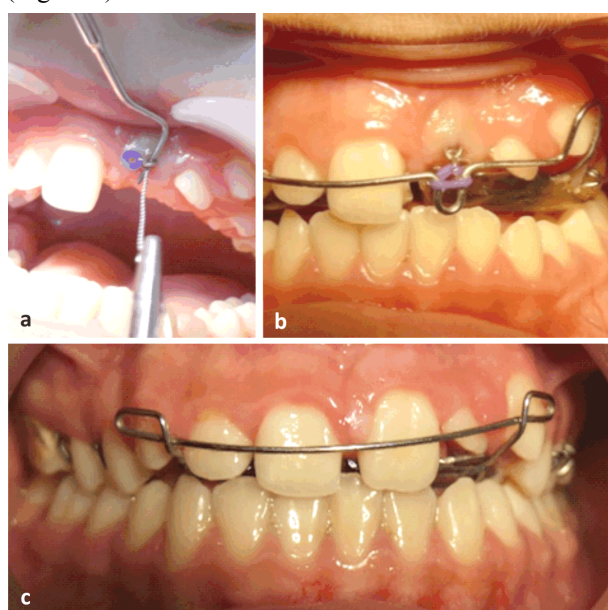


Figure 5 – (a–c) Clinical aspects during the orthodontic treatment, needed complementary to removal of compound odontoma.

Discussions

Compound odontoma is an odontogenic tumor that is frequently found adjacent to teeth, can associate eruption disturbances and teeth malposition, therefore an early diagnosis being beneficial to minimize potential complications.

Compound odontomas are odontogenic tumor with high level of organization of the tissues inside [13]. In the case reported, odontoma presented multiple calcified structures, of different size and shape. Some of them resembled to deformed mini-teeth, of various size, the biggest tooth-like structures were of about 5 mm, arranged in a conglomerate. As their morphology, most of the mini-teeth presented a morphology rather similar to incisors, in correspondence to the morphology of the teeth where odontoma was located. At the surface level, they presented multiple irregularities.

Ones of most common complications to odontomas are eruption disturbances and teeth malposition [2]. In the reported case, odontoma blocked the eruption of the permanent central incisor, and considering its topography it can be considered the main factor contributing to malposition of neighboring teeth. Similar to other reported cases, orthodontic alignment of the malpositioned teeth was somewhat challenging [5].

Odontoma has been cited to associate root resorption of adjacent teeth [5]. Root resorption is a complication that can negatively affect the prognosis of the teeth [14, 15]. In this case, an atypical root resorption of deciduous central incisor was found, characterized by presence on root surface adjacent to the tumor. The permanent teeth did not show radiological signs of root resorption.

Removal of odontoma is cited to be frequently followed by a rapid spontaneously eruption of the impacted corresponding tooth [5, 16], this not being the case in the patient presented in this manuscript. This may be related to patient age at the time odontomas was removed, or linked to some associate bone modification.

Odontogenic tumors are cited to have a low prevalence, of 0.002–0.1%, of which compound odontoma is the most frequently encountered [5]. Its prevalence is probably lower considering its diagnosis is made upon radiological examination. Correspondingly, this tumor is diagnosed usually in the second decade of life [2], consequently associating more severe complications. Early diagnosis and proper treatment conduct can significantly contribute to avoiding lengthy corrective treatments [13]. Also, early diagnosis is especially important for the odontoma located in the area of the maxillary incisors, considering this is a highly demanding area from aesthetics, phonetics and functional point of view [17].

Conclusions

A case of a patient with compound odontoma has been reported, highlighting aspects of its morphology and clinical findings. The tumor presented multiple calcified structures, some of them resembling to mini-teeth, arranged in a conglomerate. It associated impaction of maxillary central incisor, malposition and eruption disturbances of adjacent teeth. In order to minimize side effects, especially when it is localized in an area with great impact on facial

esthetics, early diagnosis and proper treatment conduct are of great importance.

Conflict of interests

The authors declare that they have no conflict of interests.

Ethics statement/confirmation of patients' permission

No ethics approval was required. Consent from patient's parents was obtained for treatment and to publish oral photographs and radiographs.

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