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Management strategy of a Large Compound Odontoma of the Previous Maxilla Associated with Unerupted Teeth: A Case Report

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1. Abstract

Odontomas are the most common benign odontogenic tumors, accounting for 67% of all such tumors. These growths are characterized by slow development and are considered hamartomas, resulting from developmental malformations of odontogenic tissues. Typically asymptomatic, odontomas are often detected during routine radiographic examinations or when investigating retained deciduous teeth in children. The exact cause of odontomas remains unknown, and they are generally classified into two types: compound and complex odontomas. Compound odontomas are rare, tooth-like structures arranged in a uniform manner, similar to normal teeth. In some cases, the tumor can grow large enough to cause bony expansion of the jaws, leading to facial asymmetry. Early diagnosis and surgical enucleation of the tumor are recommended to prevent the impaction of unerupted teeth. We report in this paper a rare case of a large compound odontoma on the anterior maxilla associated with unerupted teeth in a 10-year-old male patient, as well as the management strategy used in this case.

2. Introduction

According to the 2005 World Health Organization classification, odontomas are defined as benign odontogenic tumors that contain various dental tissue components and are typically detected during the first two decades of life [1,2]. They account for 67% of all odontogenic tumors and are considered developmental anomalies [hamartomas] rather than true neoplasms. In these cases, odontogenic cells fail to achieve normal morpho differentiation, resulting in abnormal patterns of enamel, dentin, and cementum formation. There are two main types of odontomas: complex odontomas, characterized by an amorphous and disorganized arrangement of calcified dental tissues, and compound odontomas, which consist of multiple miniature or rudimentary teeth [3]. Although the exact cause of odontomas is unknown, potential factors include local trauma or infection, as well as gene mutations or postnatal interference with the genetic control of tooth development. Odontomas are generally slow-growing and non-aggressive, but in some cases, they can become large enough to cause bone expansion and facial asymmetry [4,5]. These tumors are usually discovered during routine radiographic examinations or when investigating retained deciduous teeth in children.

Histologically, odontomas often show the presence of enamel matrix, dentin, pulp tissue, and cementum, which may or may not exhibit a normal structure. Histopathological examination is crucial for an accurate diagnosis [6]. For compound odontomas, surgical enucleation is considered the best therapeutic option, with a very favorable prognosis and a low incidence of recurrence.

3. Case Report

A 10-year-old male patient was referred to the Department of Pediatric Dentistry at Mohamed V teaching military hospital of

Rabat with the chief complaint of missing teeth [11/21] in the central upper region of maxilla [Figure1]. The extra-oral examination revealed no abnormalities and intraoral examination revealed delayed eruption of maxillary central incisors [11/21] with the presence of right and left maxillary lateral incisors [12/22].

Radiographic examination using retro-alveolar x-ray revealed a well-defined multiple miniature teeth with unerupted first permanent upper right and left central incisors [Figure 2]. Based on the radiographic appearance, a diagnosis of compound odontoma was made. The radiographic differential diagnosis included complex odontoma, ameloblastic fibro-odontoma, and ameloblastic fibro-dentinoma. Surgical removal of the odontoma under local anaesthesia was planned. A mucoperiosteal flap on the labial surface from the permanent right lateral incisor to the permanent left incisor was reflected. The layer of bone overlying the labial surface was removed and the miniature teeth were exposed [Figure 3]. After enucleation of the lesion, the specimen was sent for histopathological examination. Histopathological reports rudimentary teeth with structures like enamel, dentin, and cementum which were intermingled with pulp- tissues [Figure 4]. Based on the appearance of the gross specimen and the histopathological examination, a diagnosis of compound odontoma was made, which is a rare entity in this region of maxilla. The permanent incisors [11/21] were surgically exposed, and the orthodontic brackets were glued in place to achieve orthodontic traction of the teeth, as spontaneous eruption of the retained teeth is not possible [Figure 5/6].

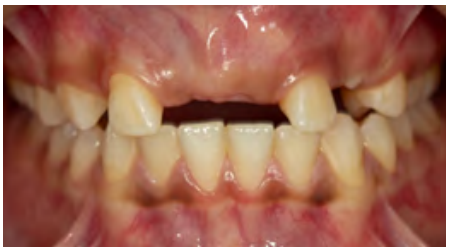

Figure 1: Clinical pre-operative view

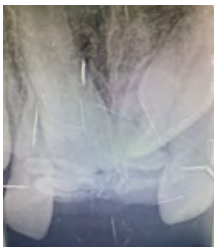

Figure 2: Retro alveolar x-ray showing the lesion as well-defined rudimentary teeth in the central maxilla region (arrow)

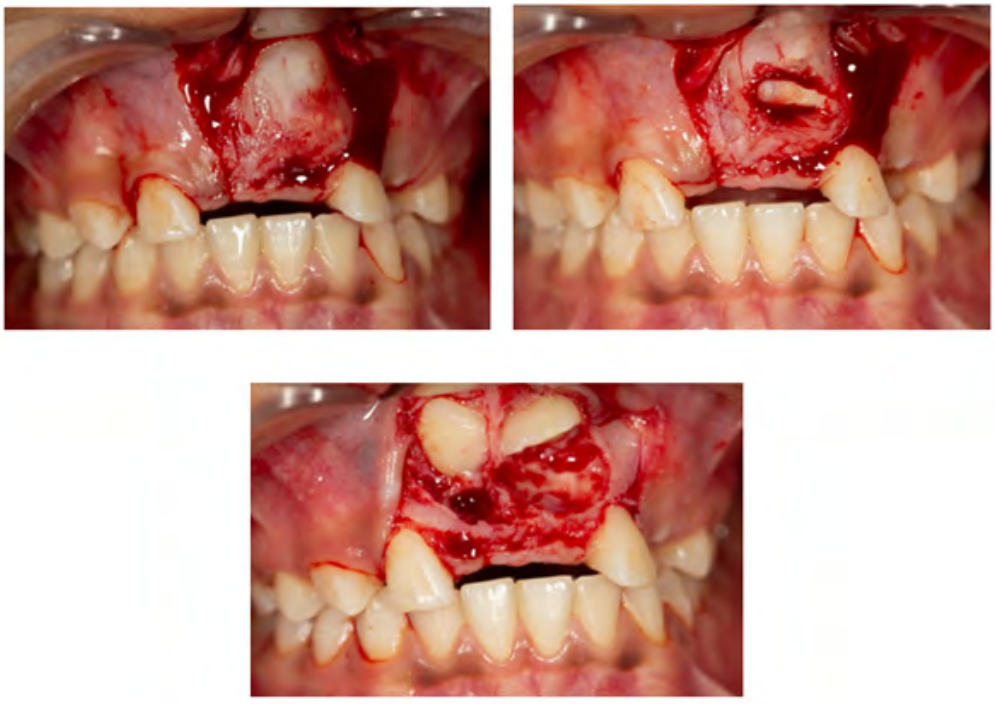

Figure 3: Surgical exposure of the compound odontomas and surgical removal of maxillary central incisors

Figure 4: Compound odontomas (4 miniature teeth)

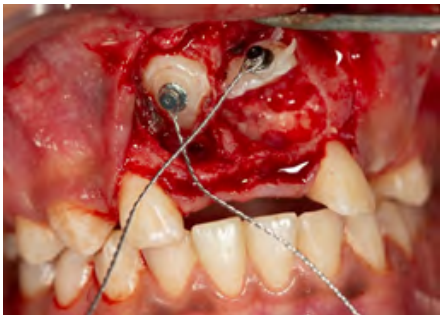

Figure 5: Bonding of orthodontic brackets

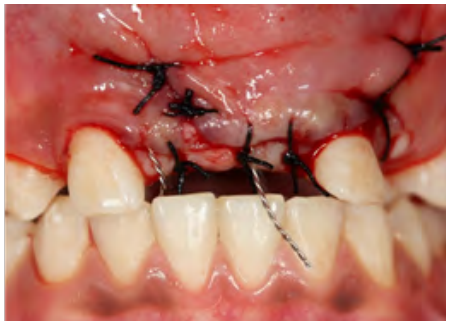

Figure 6: Suture

4. Discussion

Broca proposed in 1866 the term odontoma, who defined it as a tumour formed by overgrowth of complete dental tissue including enamel, dentine, cementum and in some cases, pulp tissue. Clinically, three types of odontoma are recognised: intraosseous, extra osseous and erupted [7]. Thoma and Goldman classified odontomas as follows: Geminated composite odontomes [two or more, 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 odontoma, cystic odontomes [8,9].

World Health Organization determined two distinct types of odontomas: complex and compound odontoma. In complex odontomas, all dental tissues are formed, but appeared without an organized structure, as amorphous conglomerates of hard tissue [10,11]. Histologically, they are characterized by sheets of immature tubular dentin with encased hallow tooth like structures. Ghost cells are especially seen in complex odontoma. Most of these lesions are discovered suddenly on radiographic examination. The common signs and symptoms include impacted permanent teeth and swelling. Budnick found that 61% of cases are associated with impacted teeth [12]. The origin of compound odontoma is not defined exactly; some suggestions about trauma or infection were proposed. Lopez-Areal., *et al.* found that a child developed multiple odontomas after intrusion of incisor teeth at the age of 10 months [13]. Hitchin proposed the hypothesis of genetic mutation as a result of odontomas. An increased number of odontomas were found in people with Gardner's syndrome which is a heritable syndrome [14,15].

Radiographically, compound odontoma appears as a multiple radio-opaque miniatures teeth. Conservative surgical enucleation of the lesion is the treatment of choice until the spontaneous eruption of retained teeth. In our case, orthodontic traction was necessary.

5. Conclusion

Early diagnosis and treatment of compound odontomas is very important to avoid later complications such as retention of primary teeth and failure of permanent teeth to erupt. Careful follow-up of the case, both clinically and radiographically, is necessary to assess the eruption of the unerupted or impacted teeth. Compound odontomas generally have a favorable prognosis with a low probability of recurrence.

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