Case Report

Orthodontic Management of An Impacted Maxillary First Bicuspid Due To Odontoma

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ABSTRACT

The participation of a multidisciplinary team to accomplish the appropriate treatment of impacted tooth with odontoma is extremely relevant because of the esthetic and functional ramifications of a missing tooth as well as the psychological well-being of the individual. Odontomas are the most common type of odontogenic tumors and generally they are asymptomatic. Two types of odontomas are described: compound and complex based on either the appearance of well-organized tooth-like structures (compound odontomas) or on a mass of disorganized odontogenic tissues (complex odontomas). Odontomas frequently interfere with eruption of teeth leading to their impaction. This is a case report of a 16-year-old boy with unerupted maxillary left first bicuspid due to a complex composite odontoma .Surgical excision of the odontomas and orthodontic treatment to get the impacted maxillary left first bicuspid into alignment is discussed.

Key words: impacted maxillary left first bicuspid, complex odontoma, orthodontic management.

INTRODUCTION

The term odontome was coined by Paul Broca in 1867. Broca defined the term as tumors formed by the overgrowth or transitory of complete dental tissue.[1] Odontomas by definition alone refers to any tumor of odontogenic origin. This is because odontomas result from the growth of completely differentiated epithelial and mesenchymal cells that give rise to ameloblasts and odontoblasts.[1] In a broad sense, it means a growth with both the epithelial and mesenchymal components exhibiting complete differentiation resulting in functional ameloblasts and odontoblasts.[2] These cells in turn form variable amounts of enamel and dentin and pulpal tissue of the odontoma.[3] 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. So they are considered as developmental anomalies rather than true neoplasm.

According to WHO classification (1992), two type of odontomas are acknowledged.

- Compound odontomas malformations with representation of all dental tissues and exhibiting an orderly distribution in which numerous tooth-like structures known as denticles are found.
- Complex odontomas malformations in which all dental tissues are likewise represented, but showing a disorganized distribution.

This lesion is composed of more than one type of tissue, and for this reason, has been called a composite odontoma. Accordingly we have

- Complex composite odontoma
- Compound composite odontoma

Other types of odontomas are sometimes also seen, presenting combinations of the characteristics of compound and complex odontomas (i.e. mixed odontomas), while in other cases the lesions cannot be assigned to either of the two types (cystic adenomas).[4,5]

Although the etiology of this malformation is not yet known, there is some evidence to show that there is a genetic basis for both complex and compound composite odontomas. Heredity is a possible factor and persistent lamina could be the hidden inherited developmental anomaly. Other theories have been proposed, including local trauma, infection, family history, and genetic mutation.[6]

CASE REPORT

A 16-year-old, male patient reported with the chief complaint of forwardly placed front teeth and unerupted tooth to the Department of Orthodontics and Dentofacial Orthopedics. His medical history was not significant. Extraoral examination revealed no facial asymmetry (Figure 1). Intraoral examination revealed unerupted maxillary left first bicuspid, but with no inflammation of the overlying mucosa (Figure 2).

Figure 1–Pre-treatment photograph (extra-oral)

Figure 2–Pre-treatment Photograph (intra-oral)

Figure 3 –Pre-treatment radiograph

Intra-oral periapical, occlusal, and panoramic radiographs revealed the presence of the left first bicuspid with a cluster of radiopaque masses present occlusal to impacted tooth, thereby obstructing its eruption (Figure 3). On the basis of clinical and radiographic findings, a provisional diagnosis of odontoma was established. Complete excision of the odontoma under local anesthesia and orthodontic treatment for alignment of the impacted incisor was planned. Accordingly, a 0.022" MBT prescription preadjusted edgewise appliance was bonded on the upper arch. There was adequate space for the alignment of the impacted left first bicuspid in the arch. A mucoperiosteal flap extending from the labial surface of left canine to the left molar was reflected and the calcified mass was exposed (Figure 4). This was carefully excised without disturbing the unerupted tooth. The calcified structure counted (11) eleven in number of different shapes and sizes. (Figure 5).The specimen was sent for histopathological examination which confirmed it as a Compound composite odontoma (Figure 6). Curettage was done in the area and the area was debrided of any remnants. The layer of bone covering the labial surface of the impacted left first bicuspid was removed and the crown was exposed. A Begg's bracket with a ligature wire extending was bonded onto the impacted left first bicuspid (Figure 4, 7). The area was irrigated and the mucoperiosteal flap was sutured back in position. The ligature wire extending from the bracket bonded on the impacted incisor was tied to the archwire thereby causing forced extrusion of the impacted incisor. The patient was recalled at 4-week intervals for tightening the ligature wire. After three visits, the right central incisor erupted into the oral cavity. 0.012" nickel titanium wire was engaged piggyback on the erupting incisor with a 0.016' × 0.022" stainless steel base archwire. Seven weeks later the impacted tooth was properly aligned in the arch. The Begg's bracket was replaced with a 0.022" MBT prescription bracket and final finishing and detailing was achieved (Figure 8).

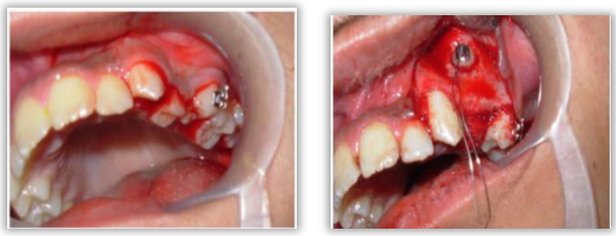

Figure 4 –Surgical Procedure of Excision of Odontoma and Bonding of Begg's Bracket

Fig.5 Surgical Specimen Consisting of 11 (Eleven) Malformed Tooth like Structure

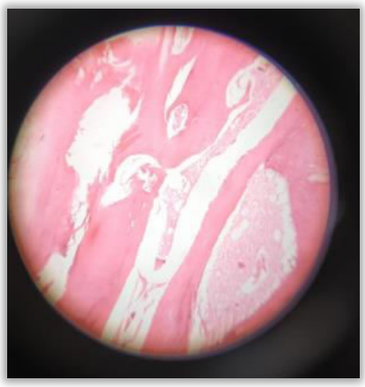

Fig.6 Microscopic View (10X)

Fig.7 Mid-treatment radiograph (IOPA)

Figure 8 – Post-treatment photograph

DISCUSSION

Odontomas constitute about 22% of all odontogenic tumors of the jaws. Approximately, 10% of all odontogenic tumors of the jaws are compound odontomas.[7, 8] The incidence of compound odontome ranges between 9 and 37% and the complex odontome is between 5 and 30%.[9] The compound odontoma is slightly more common than the complex odontoma which in turn is more common than the ameloblastic odontoma. The majority of odontomas in the anterior segment of the jaws are compound composite in type (61%), whereas the majority in the posterior segment is complex composite in type (34%).[9] Interestingly both type of odontomas occurred more frequently on the right side of the jaw than on the left, (compound 62%, complex 68%). The compound composite odontome most frequently occurred in incisor cuspid region of the upper jaw in contrast to the complex odontome which were commonly found in molar and premolar region of the mandible.[10, 11] Thus, this is a rare case of Compound composite odontoma located in left side of maxillary posterior region.

Radiographically, a fully formed compound odontoma appears as a radiopaque lesion, sometimes with a radiating structure, but in the developing stages it shows as a well-defined radiolucent lesion in which there is progressive deposition of radiopaque material as calcification of the dental tissues proceeds. Comparatively well-organized malformed teeth or tooth-like structures or denticles of varying size and shape surrounded by a narrow radiolucent zone.

Histologically, the fully developed compound odontoma consists of a mass of disorderly arranged, tooth-like structures with central cores of pulp tissue that are encased in shells of dentin and partially covered by enamel surrounded by a fibrous capsule similar to the follicle surrounding a normal tooth. [12]

The treatment of choice is surgical excision. In general, the prognosis of these tumors is very favorable, with a scant tendency toward relapse.

SUMMARY

Each tooth is important for proper occlusion in dental arch, without any root or periodontal sequelae. The treatment was considered a success, since both health and function were recovered. The importance of the clinical and radiographic diagnosis of the retention of a permanent tooth associated with a pathological entity should be emphasized. The participation of a multidisciplinary team to accomplish the appropriate treatment of such patients is extremely relevant because of the esthetic and functional ramifications of a missing tooth as well as the psychological well-being of the individual.

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