ORTHODONTIC TRACTION OF IMPACTED TOOTH ASSOCIATED WITH ODONTOGENIC TUMOR: CASE REPORT

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ABSTRACT

Odontoma is the most common benign odontogenic tumor and it is not rare to be associated with unerupted tooth. Impaction of the upper second molar is an uncommon problem and sometimes it is very challenging for both orthodontist and oral surgeon. This report describes the surgical management of a 15-year-old boy who had an impacted upper right second molar associated with complex odontoma in the posterior maxillary area. The treatment was surgical removal followed by sequential traction of the impacted tooth. This case emphasizes the importance of careful analysis of the initial orthodontic treatment and also emphasizes the preservation of unerupted teeth associated with benign odontogenic tumors.

Key words: Complex odontoma, odontogenic tumors, unerupted tooth, orthodontic traction

INTRODUCTION

Odontomas are the most common benign odontogenic tumors and they are considered to be developmental anomalies resulting from the growth of differentiated epithelial and mesenchymal cells. Odontomas had nonaggressive behavior and are formed of enamel, dentin, cementum and sometimes pulp tissue. They are classified as complex, when the calcified tissues present simply as an irregular mass in a disorderly pattern, or compound, if an agglomeration of small structures resembling rudimentary teeth is presented.1 The etiology of either type is unknown. Odontomas are most often seen in the maxilla and they are frequently associated with the delayed eruption of permanent teeth. Complex odontomas are less common than the compound, in the ratio 1:2.2 It is not unusual the
presence of odontoma causing impaction of a tooth, which is often extracted with the surgical removal of the lesion.

CASE REPORT

A 15 year-old boy was referred to our service (Department of Oral Medicine, Bauru Dental School, University of Sao Paulo, Bauru, Brazil) for the evaluation of the clinical absence of the upper right second molar (tooth 17). Clinically, it was noticed a discrete swelling in the posterior region of right maxilla. A Cone Beam Computed Tomography (CBCT) scan was performed and it was observed the presence of a well-circumscribed hyperdense lesion, with approximately 8mm of diameter, located coronally and distally to an impacted upper right second molar (Figure 1). The presumptive diagnosis was of compound or complex odontoma blocking the eruption of the referred second molar. The treatment of choice was surgical intervention by enucleation of the lesion associated with maintenance of the tooth 17. It was planned expose the impacted tooth and its orthodontic eruption. After curettage of the lesion, it was made acid-etching using 37% phosphoric acid for 1 minute on the coronal surface of the tooth 17. Then, conventional light-cured composite resin (Transbond XT; 3M/Unitek, Monrovia, CA) was used for the orthodontic bracket bonding. The microscopy revealed disclosed disorganized proliferation of odontogenic cells with enamel synthesis, dentine and pulpal tissue in the most internal portions of dentin. The odontogenics tissues presented disorganized complex soft and hard odontogenic tissue mass (Figure 2). The final diagnosis was complex odontoma. The tooth was correctly positioned with no lesion recurrence (Figure 3).

Figure 1. Preoperative CBCT (Cone Beam Computed Tomography). Axial (A), coronal (B) and sagittal reconstruction showing an hyperdense image suggestive of Odontoma located coronally to the impacted tooth.
Orthodontic traction of impacted tooth associated with odontogenic tumor

Figure 2. Proliferation of odontogenic cells with enamel synthesis, dentine and pulpal tissue in the most internal portions of dentin (400 x magnification – hematoxylin & eosin staining).

Figure 3. Clinical aspect after treatment.

DISCUSSION

Dental impactions can occur due two main factors: (1) pathological, such as a tumor, cyst, local or systemic bone pathology that increases the bone density that can displace or block the eruption of the tooth, and (2) developmental, such as jaw size, eruption pattern of the teeth, supernumerary teeth, or ankylosis. Odontoma is the most common type of
benign odontogenic tumor and 70% of them are associated with abnormalities such as impaction, malpositioning, diastema, aplasia, malformation, and devitalization of adjacent teeth. They are usually diagnosed in the second decade of age and are most typically classified as mixed radiolucent and radiopaque odontogenic tumors.

The management of impacted second molars has been a challenge for orthodontists and oral and maxillofacial surgeons.\textsuperscript{4} The impacted second molar is usually recognized when orthodontic treatment is complete and the roots are fully formed.\textsuperscript{4} Proper alignment of the second molar into the dental arch in an angle Class I position is an integral part of completing orthodontic therapy.\textsuperscript{4} Management of impacted second molars requires a team approach with the orthodontist, oral and maxillofacial surgeon, and general dentist.\textsuperscript{4} Impaction implies the failure of the tooth to erupt into the oral cavity after development of the roots is complete (closure of the apices).\textsuperscript{3} A tooth with open apex is considered “unerupted” until the root is fully developed.\textsuperscript{3} Careful radiographic examination can determine the stage of development, and may deem an unerupted tooth likely to become impacted if the orientation of its long axis does not lie in the path of eruption.\textsuperscript{3}

The decision to upright the impacted second molar is usually made by the orthodontist.\textsuperscript{5} The patient is referred to an oral and maxillofacial surgeon to discuss this combined orthodontic and surgical approach.\textsuperscript{4} This treatment plan may not be successful if the second molar root has two-thirds root formation.\textsuperscript{3,4} In our clinical case, the second molar had more than two-thirds root formation and the tooth has been uprighted to its correct position without absorption of the roots.

It is possible to diagnose the presence of an unerupted tooth through panoramic radiography.\textsuperscript{4} Periapical radiographs are also useful, especially using Clark's Rule, because it tells us if the clinical crown is tilted buccally or lingually.\textsuperscript{4} The advent of CBCT scan has been a monumental event for improving the diagnostic options and capabilities of the orthodontist.\textsuperscript{3} Familiarity and full utilization of its many options can provide the dentist with a valuable treatment planning device.\textsuperscript{3} The CBCT evaluation of impacted teeth due to such lesions can help in localization of these teeth, as well as assessment of the extent of change/destruction to the surrounding structures.\textsuperscript{3} The ability of CBCT to project these structures in three different planes decreases the chances of injuring them and the remaining dentition.\textsuperscript{3} The axial plane allows for buccolingual assessment of the tooth position.\textsuperscript{3} The coronal plane and the sagittal plane can show mesiodistal, and the sagittal plane can show the mesiodistal orientation of the posterior teeth as well as the faciolingual tip of the long access of the anterior teeth.\textsuperscript{3}

In this case, the use of CBCT images allowed an accurate surgical planning to remove the odontoma. In fact, accurate surgical planning can help minimize the trauma to the developing permanent teeth during surgical removal.

Surgical treatment of the odontoma consists of complete enucleation and curettage of the lesion and surrounding area.\textsuperscript{1,4,5} Recurrence does not occur if it is done. Careful histologic and radiographic examination of these tumors is necessary because these lesions may resemble a much more aggressive neoplasm as the odontoameloblastoma.\textsuperscript{1,5}

In this clinical case there are two options for treatment: surgical removal of the lesion and the tooth or orthodontic traction of this. The enucleation of the lesion followed by orthodontic traction of the impacted upper right second molar was the treatment choice. Due the odontomas have a benign behavior and absence of recurrence, unerupted teeth associated with odontomas can be preserved. Adequate planning should be done with the
orthodontist for the correct positioning of the tooth, beyond the care that the surgeon should have during the removal of the lesion. The earlier the odontomas are diagnosed, the greater chance of success, therefore, the initial documentation in the case of patients undergoing orthodontics should be carefully evaluated.

COMPETING INTERESTS

The authors certify that they do not have any actual or potential conflict or competing interest.

REFERENCES