

Multiple compound odontoma with maxillary canine impaction: combined orthodontic and surgical management

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Abstract

A case of bilaterally impacted maxillary permanent canines with associated left maxillary compound odontoma with cortical bone swelling obstructing the path of eruption of the left permanent maxillary canine and retention of primary canine on the right maxillary anterior segment. Management was by extraction of the right maxillary primary canine, surgical excision of the compound odontoma on the left maxillary anterior segment and surgical exposure of both maxillary permanent canines with subsequent orthodontic traction in order to move the impacted canines to their normal anatomic positions.

Keywords: *Odontoma, impacted maxillary canine, orthodontic traction*

Résumé

Un cas de canines permanentes maxillaires impactées bilatéralement avec odontome composé maxillaire gauche associé avec gonflement de l'os cortical obstruant le chemin d'éruption de la canine maxillaire permanente gauche et rétention de la canine primaire sur le segment antérieur maxillaire droit. La prise en charge était par extraction de la canine primaire maxillaire droite, excision chirurgicale de l'odontome composé sur le segment antérieur maxillaire gauche et exposition chirurgicale des deux canines permanentes maxillaires avec traction orthodontique ultérieure afin de déplacer les canines incluses dans leurs positions anatomiques normales.

Mots clés: *Odontome, canine maxillaire incluse, traction orthodontique*

Introduction

Odontomas are developmental anomalies resulting from the growth of completely differentiated epithelial and mesenchymal cells that give rise to ameloblasts and odontoblasts [1]. These lesions are basically formed of enamel and dentine but they may also have

variable amounts of cementum and pulpal tissue [2]. Odontomas can either be compound or complex. Compound odontomas are formed when enamel and dentine are deposited with the developing lesion in such a way that the resulting structures show an anatomic similarity to normal teeth [3]. However, when the dental tissues form a simple irregular mass occurring in a disorderly pattern, it is described as a complex odontoma [3].

The aetiology is unknown [4] but it has been suggested that trauma and infection at the site of the lesion could result in ideal conditions necessary for the development of odontomas [4,5] or they could be inherited or are due to a mutant gene or interferences, presumably postnatal, with the genetic control of tooth development [6]. These lesions may be found in either anterior or posterior regions of the dental arches with compound odontomas majorly located in the anterior maxilla while complex odontomas are majorly located in the posterior mandible [2,7-9]. They are usually slow growing, asymptomatic and they rarely exceed the size of a tooth, but when large can cause expansion of the cortical bone [2]. Their diagnosis is usually accidental through investigatory radiography and are mostly during the 1st and 2nd decades of life though may be detected at any age [2,10]. Radiographically, compound odontomas appear as structures resembling teeth at the center of a well-defined radiolucent lesion while complex odontomas appear as irregular calcified masses surrounded by a thin radiolucent area with smooth periphery. A developing odontoma can be discovered by routine radiography, but may cause difficulty in identification due to lack of calcification [4].

Odontomas could also be associated with unerupted or missing teeth but the latter is rare [2,5,8,11]. They are mostly intraosseous but may erupt occasionally into the oral cavity. In descending order, the impacted teeth frequently associated with odontomas are canines, upper central incisors and third molars [12].

Histology usually reveals presence of enamel matrix, dentine, pulp tissue and cementum which may or may not exhibit a normal relationship [2,4]. Compound odontomas are formed by tooth-like structures which resemble pulp tissue in the central

portion surrounded by a dentine shell and partially covered by enamel. Complex odontomas on the other hand, are conglomerates without orientation of enamel matrix, dentine, areas of pulpal tissue and cementum [4].

Odontomas are treated by conservative surgical removal and there is little probability of recurrence [2,5]. Orthodontic traction should however be carried out soon after excision of the lesions when they are associated with unerupted teeth and diagnosis was not made early when the tooth still has a greater potential of erupting due to its open apices [7,13].

Here, we describe the management of a patient who had multiple odontoma with bilateral maxillary impacted canines.

Case report

A 25-year old XX who presented at the Orthodontic Out-patient Clinic with a complaint of having a large arch length space and hard swelling on the left maxillary anterior segment which was noticed about twelve years prior to presentation. There was no contributory Dental/Medical history in relation to this complaint. On examination, she presented with Angle's Class I malocclusion with severe maxillary anterior spacing and a firm maxillary buccal swelling measuring 20mm by 30mm in relation to the left maxillary lateral incisor and first premolar. The right maxillary primary canine was retained and both maxillary permanent canines were unerupted. The overjet was 7.0mm and there was associated maxillary dental midline deviation to the right by 4.0mm. The left maxillary lateral incisor was mesiolabially rotated and both maxillary lateral incisors were microdonts. Radiographic examination (Orthopantomogram) revealed the presence of an odontoma-like lesion obstructing the path of eruption of the unerupted left maxillary canine. Both maxillary permanent canines were found to be in favourable positions for orthodontic traction and alignment on the arch.



(a)

Fig. 1 (a) Odontoma with cortical bone swelling as indicated by the arrow.



(b)

Fig. 1: (b) Retained right maxillary primary canine

The patient was scheduled for surgery which included extraction of the retained right maxillary primary canine and subsequent surgical exposure of the permanent canine for orthodontic traction, excision of the odontoma like structure on the left maxillary quadrant obstructing the path of eruption of the left maxillary canine and exposure of the canine for orthodontic traction. She was also planned for fixed straight wire appliance to align all the teeth on the arch, correct increased overjet and the maxillary dental midline deviation. The entire procedure and duration of treatment was explained to the patient and informed verbal and written consents were obtained.



Fig. 2: Orthopantomogram of the patient showing odontoma

The surgical method of choice adopted for this case was the closed flap technique. Surgical excision of the odontoma was performed and extraction of the upper right primary canine was done under local anaesthesia using 2% Lidocaine in 1:100,000 Adrenaline without any premedication. Four calcified small tooth-like structures and two calcified large molar tooth-like structures with tortuous roots were found and removed on the left maxillary quadrant. Specimen were placed in 10% formal saline and sent to the oral pathology laboratory for histology. Lingual buttons with ligature lasso were bonded on the labial surfaces of the unerupted

maxillary canines intraoperatively. The histology revealed similar layering of normal tooth in relation to enamel matrix, dentine and pulp.



Fig. 3: (a) Odontoma specimen removed during surgery.



Fig. 3: (b) Exposure of left maxillary canine following removal of odontoma



Fig. 4: (a) Emergence of left and right permanent maxillary canines following orthodontic traction (b) Arrow showing orthodontic traction on impacted right permanent canine.

Orthodontic treatment using straight wire appliance was commenced four weeks after the surgical procedure and orthodontic traction with elastic thread was commenced on the unerupted canines six months into the treatment, following alignment and levelling stage.

After 13 months of treatment, both maxillary canines were finally brought into the dental arch.



Fig. 5: Both left and right permanent maxillary canines in their normal anatomic positions

Discussion

Odontomas are relatively common odontogenic lesions which are usually asymptomatic and are rarely diagnosed before the second decade of life. They frequently lead to delayed eruption, displacement or impaction of permanent teeth [2,3].

The case described in this study was initially diagnosed as compound odontomas due to the number of calcified structures anatomically similar to teeth as seen on the radiograph [2,3,5]. However, this diagnosis was confirmed by histological examination of the lesions following surgical excision.

The tumor was found on the anterior region of the maxilla which is the location most commonly associated with compound odontomas [2,7,8,9]. It has also been reported [14] that compound odontomas occur more frequently on the right anterior maxillary region, this was not so in this present case where it

was found to be located on the left anterior maxillary region. This case was also associated with expansion of the cortical bone which was a contributory factor to the diagnosis of the lesion.

Although odontomas show variation with regard to the age of occurrence, it is typically detected by the third decade of life and this is a similar occurrence in this case [15].

In a study reported by Iatrou et al [16], 16 of 26 cases with odontoma were associated with impacted teeth and treatment consisted of removal of the lesion and orthodontic traction of the impacted tooth. Spontaneous eruption of the impacted tooth following excision of the lesion was reported in only one of the cases and this is usually in cases of early detection of lesion and spontaneous removal of the obstructive lesion in the path of eruption of the tooth that is young and has great potential of erupting unassisted. This was not the situation in this case where the apices of the teeth (canines) are closed due to maturity and has little or no potential to erupt on its own hence needed assistance through orthodontic traction. This is in-line with documented line of procedure for treating impacted teeth with closed apices where it is generally recommended that the odontoma be excised, the impacted tooth exposed and an attachment bonded on the exposed tooth for orthodontic traction in a single session to facilitate the eruption of the tooth [14,17]. Factors to be considered in the management of impacted canines include depth of impaction, degree of angulation or deviation and developmental stage of the tooth [18,19]. Other treatment options that could be carried out besides surgical exposure and orthodontic traction include; no treatment, extraction of the impacted canines with prosthetic replacement and autotransplantation.

The maxillary canines in this case were both brought out of their initial position through orthodontic traction and positioned properly on the arch in 13 months. A post treatment retention phase was commenced immediately following alignment with the use of both fixed and Hawley retainers and the patient was satisfied and happy with the treatment outcome.

Conclusion

Odontomas are usually revealed on routine radiography and are commonly associated with delayed eruption and or impaction of teeth. Subsequent growth of odontomas can be related with displacement of teeth and also swelling of cortical bone. However, surgical excision of odontomas and orthodontic traction of impacted teeth and alignment could achieve a satisfying outcome that could make patient happy.

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