

Orthodontic treatment of impacted anterior teeth due to odontomas: a report of two cases

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Two cases are presented where the odontomas had caused the impaction of the anterior teeth and required a combined surgical and orthodontic treatment to bring these teeth into the arch. In the first case a large a complex odontome had caused the impaction of the right central incisor, lateral incisor and canine. In the second case a compound odontome blocked the eruption pathway of the right central incisor. It is emphasised that radiographic examination of all pediatric patients that present clinical evidence of delayed permanent tooth eruption or temporary tooth displacement with or without a history of previous dental trauma should be performed. Early diagnosis of odontomas allows adoption of a less complex and less expensive treatment and ensures a better prognosis.

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INTRODUCTION

Odontomas are considered as developmental anomalies resulting from the growth of completely differentiated epithelial and mesenchymal cells that give rise to ameloblasts and odontoblasts. These tumors are formed of enamel and dentin, but they can also have variable amounts of cementum and pulpal tissue.¹ Odontomas constitute 22% of all odontogenic tumors of the jaws. Most odontomas are discovered during second and third decades of life.²

It was in 1867 that Paul Broca first used the term "odontoma".³ Broca defined the term as "tumors formed by the overgrowth of transitory or complete dental tissues." In 1914 Gabell, James and Payne grouped odontomas according to the developmental

origin: epithelial, composite (epithelial and mesodermal), and connective tissue (mesodermal).⁴ In 1946 Thoma and Goldman⁵ formulated a classification as follows:

- Germinated composite odontomas: two or more, more or less well-developed teeth are fused together.
- Compound composite odontomas: made up of more or less rudimentary teeth.
- Complex composite odontomas: calcified structures, which bear no great resemblance to the normal anatomical arrangement of dental tissues.
- Dilated odontome: the crown or root part of the tooth shows marked enlargement.
- Cystic odontome: an odontoma, which is normally encapsulated by fibrous connective tissue in a cyst or in the wall of the cyst.

Gorlin and associates eliminated the term composite as redundant and classified odontomas as either complex or compound.⁴ WHO classification divides odontomes into complex and compound.⁶ During the development of the tumor, enamel and dentin can be deposited in such a way that the resulting structures show an anatomical similarity to normal teeth, in which case the lesion is classified as a compound odontoma. However, when the dental tissues form a simple irregular mass occurring in a disorderly pattern, it is described as a complex odontoma. Tumors containing mature enamel and dentin together with neoplastic soft tissue component are properly classified as ameloblastic fibro-odontomas or odontoameloblastomas.⁶

The etiology of odontoma is unknown.⁷ However, it has been suggested that trauma and infection at the

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Figure 1. Extra oral photographs of Case 1.

place of the lesion can offer ideal conditions for its appearance.^{7,8} This lesion is one of odontogenic origin and is considered a self-limiting anomaly. One aspect of the etiology of odontomas is that most result from extraneous odontogenic epithelial cells.⁹⁻¹¹ When these buds are divided into several particles, they may develop individually to become numerous, closely positioned malformed teeth or tooth like structures. When the buds develop without such uncommon divisions, and consist of haphazard conglomerates of dental tissues, they may develop into complex odontomes. However the transition from one type to another is commonly associated with varying degrees of morphodifferentiation or histodifferentiation or both and it is often difficult to differentiate between both the types.¹²

Usual presenting symptoms are an impacted or unerupted tooth, a retained primary tooth and or a swelling.^{13,14} Other less frequent signs and symptoms are pain suppuration, expansion of alveolar bone and displacement of teeth.¹⁵ Some authors state that pathological change such as impaction, malpositioning, aplasia, malformation and devitalization of adjacent teeth are associated with 70% of the odontomas.¹⁶

An odontoma has a limited growth potential, but it should be removed since it contains various tooth formulations that can predispose to cystic change, interfere with eruption of permanent teeth, and cause considerable destruction of bone. Odontomas are treated by conservative surgical removal and there is little possibility of recurrence.^{1,8} Ideally odontomas should be removed when the permanent

teeth adjacent to the lesion exhibit more than half root development because this ensures safety of the normal permanent tooth and prevents interference with their eruption. Kaban states that odontomas are easily enucleated and adjacent teeth that may have been displaced by the lesion are seldom harmed by the surgical excision since they are usually separated by a septum of bone.¹⁷

We present two cases where the odontomes had caused the impaction of the anterior teeth and required orthodontic treatment to bring these teeth into the arch.

CASE REPORTS

Case 1

A 14-year-old boy reported to the orthodontic clinic for replacement of his missing anterior teeth on the right upper side. He complained of burning sensation in the region of the missing teeth. Clinical examination showed missing right maxillary central incisor, lateral incisor and canine (Figures 1 and 2). Radiographic examination revealed a complex odontoma type lesion in the anterior maxilla on the right side with impacted central incisor, lateral incisor and canine (Figure 4). It was decided to remove the odontome under general anesthesia and to decide on the operation table whether it was worthwhile trying to bring the impacted anterior teeth into the arch. The odontome was removed under general anesthesia and the impacted teeth were bonded at the same time and NiTi closed coil springs were attached to the three teeth.



Figure 2. Pretreatment intraoral photographs of case 1 showing the missing upper incisors and canines on the right side.



Figure 3. Post treatment intraoral photographs showing the erupted incisors and canines and the occlusion post debonding.

Full-banded orthodontics treatment was initiated in the upper arch a month later. We used a standard edge-wise appliance (.022 X .028). Histological examination confirmed the provisional diagnosis of a compound odontome. Traction force was applied on these impacted teeth. All the impacted teeth were aligned into the arch. The patient subsequently became irregular in keeping appointments and did not report for 1 year. After numerous recall letters he reported to our clinic and refused to continue any further treatment due to personal reasons. The central incisor however

did not have adequate attached gingiva and was advised periodontal surgery, but this did not concern the patient much. Composite veneering was done in both the central incisors. He was advised to discontinue the habit of cutting wires with his anterior teeth. The patient was given a Hawley retainer for retention. Post- debonding photographs were taken along with the radiographs (Figures 3 and 5). The patient seemed to have an adequate bone support with the bone height being satisfactory. The patient did not report for follow-up.



Figure 4. Pretreatment OPG reveals a complex odontoma in the anterior maxilla on the right side with impacted central incisor, lateral incisor and canine.



Figure 5. Post treatment OPG of the patient with erupted central incisor, lateral incisor and canine.

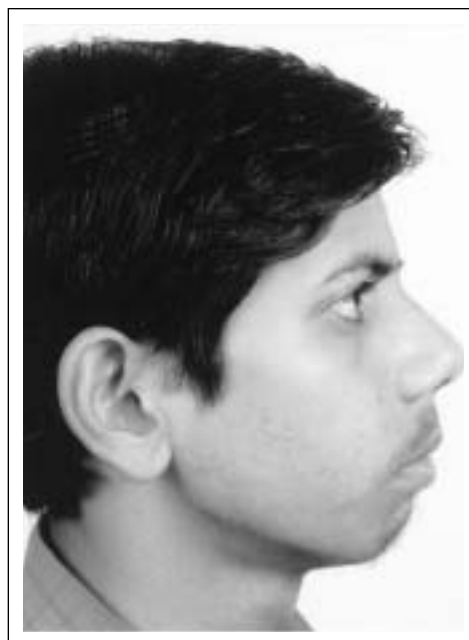


Figure 6. Extra oral photographs of Case 2.

Case 2

A 14 year old male patient reported to the orthodontic clinic with a complaint of missing right central incisor and pus draining from the adjacent erupted left central incisor. Clinical examination showed a fractured incisal edge of the patients left central incisor and missing right incisor (Figures 6 and 7). Radiographic examination revealed an impacted right central incisor associated with a compound odontome (Figure 9). Root canal treatment was started in the left central incisor and obturation was done with gutta percha in a single sitting. The patient was posted for periapical curettage to clean the apical region in relation to the left central incisor under local anesthesia. The odontome was removed in the same sitting and the impacted incisor was bonded in the same sitting. An elastomeric chain was attached to the bracket and the flap

was sutured. Full banding and bonding was done. Since it was a case of bimaxillary protrusion and it was decided to extract all the first premolars for reducing the midface convexity. The patient was bonded with .022 Roth setup. The levelling and alignment was achieved and once the patient was on .019 X .025 stainless steel a loop was made for applying extrusive force on the incisor. After three months the incisor was visible in the oral cavity. However the incisor erupted with the cingulum was present buccally. The buccal surface was bonded and a couple was applied for rotation of the incisor. The tooth was rotated by 180 degrees and was aligned into the arch. The extraction spaces were closed. The case was debonded and fixed direct bonded retainers were bonded in the same appointment. Post treatment records were taken and the patient was asked to report on recall (Figures 8 & 10).



Figure 7. Pretreatment introral pretreatment photographs of case 2 showing an impacted upper right central incisor and a complex odontome.



Figure 8. Post treatment intraoral photograph of the patient after debonding (first premolar extraction case).



Figure 9. Pretreatment OPG showing a compound odontoma in the right central incisor region with an impacted central incisor.

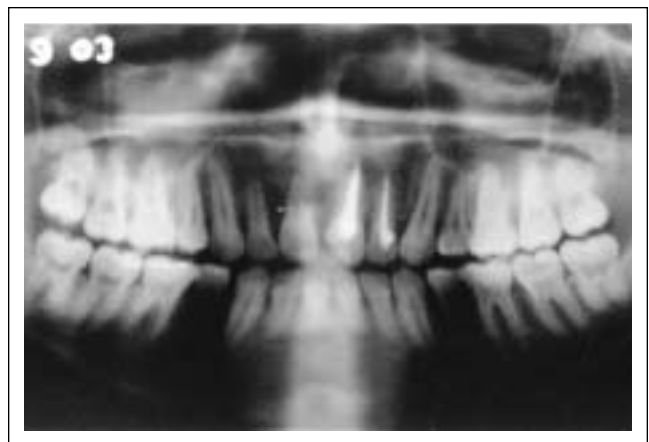


Figure 10. Post treatment OPG showing the erupted right central incisor with the final occlusion.

DISCUSSION

It is interesting to compare the predilection of compound odontomas for the anterior maxilla and predilection for supernumerary teeth for this same area. They may represent different phases of the same process with only a varying degree of differentiation.⁵ It is also interesting to note the propensity of the odontogenic adenomatoid tumor to occur in the anterior maxilla, further suggesting that this area of the jaw may be predisposed to disturbed odontogenesis. No logical explanation can be given for this predilection.¹⁸

In general odontomas are slow growing, asymptomatic and seldom exceed the size of a tooth, but when large can cause expansion of the cortical bone. Many times they are associated with unerupted teeth. The canines followed by upper central incisors and third molars are the most frequent teeth impacted by odontomas. In very few cases they are associated with missing teeth. Generally these malformations are intraosseous, but occasionally they may erupt into the oral cavity.¹⁹ A developing odontoma can be detected by routine radiography, but may cause difficulty in identification due to lack of calcification.⁷

Ameloblastic fibro-odontomas and odonto-ameloblastomas show a great resemblance to common odontomas, especially in the radiographic examination. Therefore, it is suggested that all specimens should be sent to an oral pathologist for microscopic evaluation.^{7,8}

An odontoma has a limited growth potential, but it should be removed since it contains various tooth formulations that can predispose to cystic change, interfere with eruption of permanent teeth, and cause considerable destruction of bone. Literature review suggests that radiographic examination of all pediatric patients that present clinical evidence of delayed permanent tooth eruption or temporary tooth displacement with or without a history of previous dental trauma should be performed. Early diagnosis of odon-

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