



CASE REPORT

TREATMENT MODALITY OF IMPACTED CENTRAL INCISOR ASSOCIATED WITH DENTIGEROUS CYST AND COMPOUND ODONTOME

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ABSTRACT

Impacted tooth is frequently encountered in dental practice. But the impacted tooth associated with supernumerary tooth and dentigerous cyst in anterior region is very rare case. The present case reports the successful management of impacted right central incisor with multiple odontome and dentigerous cyst by surgical intervention and orthodontic extrusion. Close eruption technique was applied after enucleation of cyst and extraction of odontome. Thirty grams traction force was applied after bonding in the labial surface of impacted tooth. Subsequently fixed orthodontic technique was applied to get impacted central incisor into occlusion.

Key words: Dentigerous cyst; Impaction; Odontome; Orthodontic extrusion

INTRODUCTION

Impacted tooth is defined as the retained tooth in the jaw beyond their normal date of eruption, surrounded by their coronary bag and without communication with the oral cavity.¹ The etiology behind the impaction may be the presence of supernumerary teeth, trauma to the primary teeth or presence of cyst, with supernumerary tooth being the main cause.² Supernumerary tooth is developed from excessive proliferation of cells or from continuous budding of the enamel organ. It was documented that the prevalence of supernumerary teeth was 0.1-3.8% of the population.³ Dentigerous cyst associated with supernumerary teeth in anterior region is very rare with prevalence of 5% among all dentigerous cysts.⁴ The present case reported highlights on the treatment modality in which the dentigerous cyst associated with supernumerary teeth were removed without salvaging the impacted permanent central incisors followed by orthodontic extrusion.

CASE REPORT

Thirty-one years old female presented with chief complain of spacing and swelling in upper anterior region of the jaw. The patient medical and family history was not significant. No obvious swelling was noticed extra orally. Intra-orally, swelling imparting bluish hue was seen in relation to upper right incisor region along with spacing in relation to 12 and 13. Minor lower anterior crowding and rotation in relation to 45 were present (Fig. 1). Orthopan tomogram (OPG) revealed the presence of impacted maxillary right central incisor and multiple supernumerary teeth with radiolucent space surrounding it (Fig. 2). Lateral cephalogram revealed no skeletal mal-relationship.

Multidisciplinary treatment approach, surgical phase and orthodontic phase were planned. Routine investigations were conducted before surgical phase which were under normal limit.



Figure 1. Intraoral photographs and OPG



Figure 2: Surgical phase and orthodontic treatment

Surgical phase

Labial mucoperiosteal flap was reflected to expose the impacted supernumerary teeth and permanent maxillary right central incisor under local anaesthesia. Multiple miniature teeth along with cystic contents were surgically removed. Irrigation with normal saline was done. Mini bracket was bonded on the exposed permanent right central incisors and tied with a ligature wire which is tied passively on arch wire segment (Fig 2). The flap was repositioned and sutured with 3-0 silk suture. The surgical specimen was sent for histopathological examination. The histopathology revealed cystic space lined by 2-3 cell

layers flattened to cuboidal shaped cells resembling reduced enamel epithelium and fibrous connective tissue capsule free of inflammatory cell infiltrate. The histopathological findings were suggestive of dentigerous cyst.

Orthodontic phase

After healing of the surgical wound, bonding in upper arch completed with 0.022 inch Roth bracket and 0.014 inch NiTi, 0.16 inch NiTi and 0.17×0.22 sq. inch NiTi were used for initial levelling and alignment. Radiological evidence of bone formation was achieved after five month of bonding. After 5 month of bonding, 30 gm of traction force was applied to impacted right central incisor through elastic chain and ligature wire with 17x25 stainless steel arch wire (Fig 2). Traction was continued till permanent maxillary right central reached the occlusal plane. Concurrently, lower bonding was also completed (Fig 2). Debonding was done after getting good intercuspation and normal overjet (Fig 3).

Right Maxillary central incisor was discoloured and didn't respond to the electric pulp vitality test. Patient was advised for endodontic treatment of 12 and for the gingival recontouring to correct asymmetric gingival margin.



Figure 3

DISCUSSION

Among many odontogenic abnormalities, supernumerary tooth is the most common disorder. It can be found as single or multiple, erupted or impacted, either in maxilla or mandible. Multiple supernumerary teeth is mainly found in mandibular premolar region but in present case multiple supernumerary teeth were found in anterior maxillary region.^{5,6} There are four different types of supernumerary teeth. They are conical, tuberculate, supplemental, odontome.⁷ In present case three odontomes were found. It was documented that persistence presence of supernumerary tooth may lead to development of dentigerous cyst which consequently may lead to formation of odontogenic keratocyst, ameloblastoma, mucoepidermoid cyst.^{8,9} Malocclusion, unesthetic appearance, dental caries, oronasal fistula, root resorption, bone resorption are the other consequences of supernumerary tooth.

Though dentigerous cyst is the second most commonly occurring odontogenic cyst, association with impacted supernumerary tooth is very rare. Dentigerous cyst is frequently found in the second and third decade of life as seen in our case and has more predilections for male unlike our case.¹⁰ Though computed tomogram is always good choice for the investigation of any impacted tooth and pathogenesis due to clear view on three dimensional images, exact location of impacted tooth, amount of bone resorption, we suggested OPG due to financial constraints of the present patient which was also effective to find out the location of impacted tooth and pathology.

The differential diagnoses of pericoronal radiolucency such as adenomatoid odontogenic cyst (AOT), follicular Odontogenic keratocyst (OKC) and dentigerous cyst were considered in our case. Calcifying odontogenic cyst (COC) was also considered as a differential diagnosis as it occurs most frequently in maxillary anteriors and is also associated with odontome as seen in our case.

AOT frequently occurs in maxillary anteriors as seen in our case and the radiographic image of AOT shows a well delineated, unilocular radiolucency surrounding the crown of retained tooth which is indistinguishable from dentigerous cysts. But histopathologically

multisized solid nodules of cuboidal and columnar epithelial cells (ameloblast like cells) forming duct nests or rosette-like structure with minimal stromal connective tissue and spindle like cells between the epithelial nodules differentiate it from dentigerous cyst.¹¹ Microscopically, presence of aberrant epithelial cells, without nuclei called "ghost cells" is the characteristic features of COC.¹² OKCs often contains parakeratinized epithelium lining and 'cheesy' material in the lumen. It is more aggressive in nature than other odontogenic cysts and may have a multilocular appearance upon radiography.¹³ Radiographic image of dentigerous cyst reveals well-circumscribed, unilocular, symmetric radiolucency around impacted tooth. Microscopically, it may be inflamed or uninfamed. when uninfamed, wall of cyst contains loose connective tissue and two or four layers of cuboidal cells. This type of dentigerous cyst is usually associated with impacted tooth. Whereas, in inflamed conditions, fibrous wall is more collagenized with chronic inflammatory infiltrate which is usually found with follicle of a permanent tooth associated with non-vital deciduous tooth.¹⁴ The present cyst was more than 5 mm and confirmed as dentigerous cyst by histopathological examinations.

Surgical enucleation or marsupialization of the cyst, extraction of supernumerary tooth followed by natural eruption of permanent tooth in children and orthodontic intervention in adult are the treatment of choice for the impacted tooth associated with dentigerous cyst and supernumerary tooth. Marsupialization is to be done in large cyst or if associated with vital organ. Scolozzi et al suggested that in large cyst bone grafting has to be performed after enucleation.¹⁵ In the present case, enucleation of cyst with supernumerary teeth has been done without bone grafting. In the present case close eruption technique was chosen since it is superior to open eruption technique in terms of esthetic and periodontal considerations. Though some authors suggested for lingual bonding of bracket to prevent bone reduction, Chawla et al suggested, any of the surface can be taken if the chances of labial trauma by attachment is less.¹⁶

The extrusion force more than 50 gm may affect adversely on the vitality of tooth in adult patient. So, 30 gm of extrusion force was applied in the present case. Though minimal force for extrusion was applied

to the impacted central incisor after completion of treatment tooth was non-vital and was advised for root canal treatment.

CONCLUSION

Thus we report this interesting case report of dramatic, complete and early resolution of the lobar lung collapse in known case of bronchial asthma. To the best of our knowledge, reviewing literature and individual experience, such early resolution of pathology have ever been reported.

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