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A Rare Case Of autotransplantation Of Impacted Teeth In Post Odontoma Sites (A Case Report With 4 Years Follow-Up)

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ABSTRACT

Odontomas represent the most common type of benign jaws tumors. Two distinct types of odontomas are acknowledged: complex and compound odontoma. Compound odontomas are often associated with impacted adjacent permanent teeth and their surgical removal represents the best therapeutic option. Auto-transplantation has recently become more popular because of a better understanding of its science, but our case which involved transplanting at a site previously occupied by an odontoma is new. This paper aimed to present a single surgical procedure to remove compound odontoma and auto-transplanted the teeth involved in order to improve prognosis, and shorten the treatment time. A case of a 12-year-old boy patient with compound odontoma associated of impacted maxillary central incisive and mandibular canine is presented. A minimally invasive surgical technique is adopted to remove the least amount of bone tissue, followed by extirpation of the odontomas and auto-transplantation of the permanent teeth involved. Final outcome shows complete healing of the bone socket. No recurrence was detected at radiographic follow up at 1 year, thus confirming the success of this therapeutic approach. After a 4-year follow-up period the teeth responded positively to vitality test. In selected cases surgical extirpation of the lesion with auto-transplantation of the tooth involved might be considered as a viable treatment to obtain healing of the lesion and physiological restoration of bone. The success of auto-transplantation depends on several factors: such as patient age, surgical technique employed, and duration of time that the tooth being out of its socket.

Keywords: Autotransplantation; Impacted teeth; Odontoma
INTRODUCTION

Odontomas are considered odontogenic hamartomas constituted by tooth-forming tissues laid down with variable degrees of organization and mineralization. Histologically, odontoma is a mixed odontogenic tumor consists of epithelial and mesenchymal cells that present as complete dental tissue differentiation (enamel, dentin, cementum and pulpal tissue). It is considered as the most common odontogenic tumors of the jaws, and constitute 22% of all odontogenic tumors\textsuperscript{1,2}. They are characterized by their slow growth and nonaggressive behavior and are usually detected incidentally in the second or third decade of life during routine radiographic examinations\textsuperscript{1,3}.

The etiology of odontoma is unknown, but local trauma, infection or mutant gene has been suggested as possible cause. The pathogenesis of odontoma is associated with trauma during primary dentition. Hereditary anomalies (Gardner’s syndrome and basal cell nevus syndrome), odontoblastic hyperactivity or alterations of genetics components responsible for controlling dental development such as as small formation, impaction, delayed eruption, bad positioning, cyst formation or displacement and resorption of adjacent teeth, but only rarely they are seem to be associated with the absence of one or more contiguous teeth\textsuperscript{4}.

According to the latest classification of the World Health Organization, two types of odontomas can be found: Complex odontoma and compound odontoma, the latter being twice as common as the former. Compound odontomas appear as numerous miniature or rudimentary teeth and complex as conglomerates of hard tissue with no similarity even to rudimentary teeth\textsuperscript{5}. Odontoma is a symptomless lesion unless it erupts. It is usually detected by routine radiograph with frequent associating with unerupted teeth, mainly mandibular third molar followed by upper canine and upper central incisor. Treatment options for cases of impacted teeth usually involve surgically aided orthodontic treatment, surgical uprighting, auto-transplantation, and surgical removal\textsuperscript{6}.

Autotransplantation is another treatment option of impacted teeth. It means a traumatic surgical removal of the tooth from its impacted site to be re-implanted in its correct position. This case report presents the autotransplantation of impacted teeth associated with odontoma. The success of autotransplantation process depends on several factors: like patient age, developmental stage of the transplanted tooth, type of transplanted tooth, surgical technique employed, and duration of time that the tooth being out of its socket\textsuperscript{7}.

CASE REPORT

A patient attended the department of Oral and Maxillofacial Surgery, Hasan Sadikin Hospital with complains of a missing upper front tooth and a hard swelling above the gum in that region. The patient was a healthy boy with no other systemic or oral health issues. On careful examination, a tip of enamel-like hard tissue slightly protruding at the edentulous gum was visible. Two firm protuberances were felt in the labial sulcus beside the labial frenulum of upper and lower jaw. In orthopantomograph, radiopaque masses were visible in
the alveolar region between 12-21, and 34-32 the missing 11, 33, 34 being impacted apical to the pathology as a separate entity (Fig. 1). We decided to excise the radiopaque masses and transplant the impacted 11, 33 and 34 to its proper position in one stage surgery.

CASE MANAGEMENT

One hour prior to surgery patient was given intravenous prophylactic antibiotic. Extraoral and intraoral antisepsis was performed with povidone iodine 10%. The surgery was performed under general anesthesia. The surgical procedure was initiated with a triangular incision, from the maxillary central incisive to right primary canine. A relaxing incision was performed to allow a mucoperiosteal flap raise to expose the very superficially located mass (Fig. 2a).

Figure 1. Impacted 11, 13, 23, 33, 34 with radiopaque masses between 12-21 and 35-32

Figure 2. a. Surgically exposed of odontoma and impacted tooth; b. Several blocks of lession were removed.

Figure 3. Transplants in position.
Figure 4. Clinical and radiographic at 4 years follow up.

Surgical approach was performed using a spherical drill and after removal of bone, the calcified masses were exposed. Small tooth like masses were removed and submitted for histopathological examination (Fig. 2b). Surgical cavity was totally smoothened and small adjustments of the socket dimension were done by a round tungsten carbide surgical bur. The impacted tooth was then exposed and extracted after removing the covering bone. It was loosely fitted immediately into the socket with several blocks of alveolar bone as grafts. The flap was repositioned and sutured with interrupted stitches (Fig. 3). A periodontal pack was given.

Those sequences were done to teeth 11, 33 and 34. The transplants were kept out of incisal contact and splinted with a flexible wire bonded labially by composite. We kept the splint for 2 months. The teeth were exposed to normal function 2 weeks after the removal of splint. Follow up was done weekly for 2 months, then 6 months, and hereafter, every 6 months till date. Follow up visits showed acceptable clinical healing with no signs of tooth mobility, ankylosis or gingival recession. There were no sign of infection at any stage. There were no radiological signs of root resorption or bone loss at 4 years follow up (Fig. 4).

Histopathological examination of the excised mass showed irregularly arranged dental hard tissues with areas of cell rich pulpal tissue. Clear spaces and clefts representing the mature enamel that is lost in the process of decalcification are often seen confirming the diagnosis of a complex odontoma.

**DISCUSSION**

Many indications of autotransplantation have been identified, but our case which involved transplanting at a site previously occupied by a tumor is new. We were presented a case report with an odontoma occupying the space of missing teeth, with a fully formed impacted teeth located superiorly to the pathology. Treatment of choice for the odontoma is complete surgical removal with perfect curettage to the area in order to prevent complication like cystic changes. The challenge in our treatment plan was in replacing the missing tooth in the post-odontoma site by auto-transplantation, within a single stage surgery.
The procedure of transplantation in this case includes preparation of the recipient site which previously occupied by an odontoma and placement of the transplanted teeth slightly below occlusal plane with fine adjustment and splinting the tooth with adjacent teeth by wire and composite adhesive for 2 months. Splinting periods ranging from 2 weeks to 2 months have been reported by various authors. Maximum duration of fixation was used to this case to insure maximum stabilization, as there was no bone support the transplanted teeth. This period of fixation requires cooperation from the patient, because the fixation wire may cause discomfort to the patient and the possibility of mucous ulceration, food impaction in addition to its effect on patient's appearance.

The success of autotransplantation can be assessed using clinical and radiographic parameters during follow up time. The follow up period may range from 1 year to 14,5 years. In the presented case follow up was done weekly for 2 months, then 6 months, and hereafter, every 6 months till date. The clinical examination during the follow up period showed reasonable outcome. This was manifested through healthy gingival and periodontal tissue and normal tooth appearance with no sign of mobility. After 6 months assessment showed no sign of internal or external resorption with new bone formation around the tooth. We followed up this patient until 4 years and the radiographic assessment showed normal periodontal ligament and normal bone formation.

Autotransplantation has advantages as it induces bone formation, maintain proprioceptive function and a normal periodontal ligament and serve as shock absorber. Successful outcome of autotransplantation requires due regard to factors like minimizing periodontal ligament and cemental damage, surgical technique, splinting, antibiotic prophylaxis, approximation of bone and tooth at cervical region, gingival sealing of the tooth against microbial contamination, and a proper case-selection. Replacement resorption and inflammatory resorption of the root can be avoided by preventing procedural damage to the cementum and pulpal infection respectively. Amongst the parameters of success, the most important is the absence of chronic root resorption. We are presenting this case because of the absence of infection, a normal pocket depth, the lack of pathological tooth mobility, and the radiographic absence of periodontal bone loss at 6 months until 4 years follow-up.

The success of autotransplantation in a site that previously occupied of an odontoma has recently become more consistent compared to that of earlier studies owing to a better knowledge of healing mechanisms of the periodontal tissues. During a short treatment duration, autotransplantation gives the option of replacing the missing tooth with a natural tooth complete with a periodontal ligament and, sometimes, a vital pulp. However, the procedure is technique sensitive and strict regard to certain factors is critical for its success.

CONCLUSION

This case report presented the successful outcome for surgical management of compound odontoma with autotransplantation of associated impacted tooth. Replacing the missing tooth in post-odontoma site by autotransplantation, within a single stage surgery is a big
challenge. Preventing procedural damage and maximum stabilization are important factors to determine the success of autotransplantation in additions of patient age and surgical technique employed.

REFERENCES


