

Implant Rehabilitation with Orthosurgical Management of Compound Odontome - A Case Report

Dr. Gaurav Gupta¹, Dr. D.K. Gupta², Dr. Neelja Gupta³, Dr. Parth Shah⁴, Dr. Kuldeep Singh Rana⁵

Private Practitioner, Department of Pedodontics & Preventive Dentistry, Wisdom Dental Clinics^{1,2,3}, Jaipur, Rajasthan, Surat⁴, Gujrat, Indore⁵, MP

Abstract

Odontomas are the most common odontogenic tumors. These tumors are asymptomatic and are generally diagnosed on radiographic examination. The sole management depends on the early diagnosis, enucleation and histopathological examination of the pathological tissue. This case report presents surgical management of enucleation of compound odontoma in relation to missing lateral incisor and impacted canine in 11-year-old boy followed with orthodontic treatment and prosthetic rehabilitation with dental implants for replacement of missing tooth. After enucleation no bone augmentation procedure was required as qualitatively and quantitatively sound bone was formed by bone remodeling. The present case emphasizes that new bone formation can take place without using any graft materials for the placement of dental implants in a cases of benign pathology.

Keywords: Compound odontoma, Orthodontic extrusion, Implant stability quotient

Introduction

Odontoma is an odontogenic benign tumor of the young age according to the World Health Organization 2005 classification [1]. Despite this they are not consider as true odontogenic neoplasms but as tumor-like formations (hamartomas of dental tissues) or developmental anomalies [2]. Two main types of odontoma are described: (a) Complex odontoma, an amorphous and disorderly pattern of calcified dental tissues, and (b) Compound odontoma, multiple miniature or rudimentary teeth. Predilection of compound odontoma is towards anterior maxilla(61%). [3-7]

Numerous tooth-like structures of altered size and shape are present in compound odontoma known as denticles. They appear as radio-transparent halo containing radio-dense zones [8]. These lesions are commonly associated with impacted permanent teeth[9,10].

Treatment of odontomas consists of simple enucleation and curettage. Care should be taken, not to harm adjacent teeth or damage the adjacent vital structures. The impacted tooth can be extracted or repositioned with orthodontic treatment or the tooth can be left for spontaneous eruption and postsurgical clinical and radiological evaluation is done to know the course of these teeth. On excision of odontoma along with the reposition of impacted tooth, the clinicians face a challenge for dental rehabilitation of the patient's missing teeth.[11] This case report aims to remove compound odontoma by minimal invasive surgical procedure which is localized in the maxilla, associated with missing permanent lateral incisor and impacted canine (lying along the medial border of maxillary sinus). It also emphasizes that new bone formation can take place while repositioning of the impacted canine, for the placement of dental implants in a cases of benign pathology.

Case Report

An 11 year old boy came to our clinic with

the complain of missing tooth in the left maxillary anterior region. The patient has no relevant past medical history. He gave history of trauma of road side accident at 5 year of age. On clinical examination, lateral incisor was missing and retained primary canine was present.(Figure. 1) Patient was advised OPG which revealed that mass of radiopaque structure was present in the area of missing lateral incisor, also impacted canine was lying along the medial border of maxillary sinus.(Figure. 2) Patient's built, facial features and compliance was superior then his chronological age, that is (i.e.) patient's dental age is more which was also well observed in OPG.

A provisional diagnosis of an odontoma was made and planned for surgical enucleation of the lesion along with extraction of retained primary canine.(Figure. 3) The odontoma was excised and sent for histopathology.(Figure. 4)

The patient was treated under local anesthesia with no premedication. Histopathology of the soft tissue section showed delicate cellular fibrous connective tissue, with dense focal collection of chronic inflammatory cells like lymphocytes and plasma cells in few areas. Few islands of odontogenic epithelial cells were seen. The mass of hard tissue was confirmed to be a compound odontoma with the decalcified section showing dentinal tubules and pulp space as in the case of a normal tooth.

The patient was advised to follow up after 6 months for orthodontic extrusion of the impacted permanent canine but he returned 1 and half year later. On OPG it showed that no bone was present in the enucleated area. Anterior cross bite was also present.(Figure. 5 a,b)

Taking into consideration the above mentioned point, fixed orthodontic therapy was planned for the alignment and leveling of the teeth.(Figure. 6) After that the impacted canine was surgically exposed and retraction to bring it in occlusion started.(Figure. 7) Retraction of canine also facilitated bone remodeling in the area where bone was not present earlier

therefore, making it favorable for prosthetic rehabilitation.

Almost 1 year after the initiation of treatment, canine was in its normal position and good amount of bone was also available.(Figure. 8) Denta - scan was done for the authentication of presence of bone.

Hand and Wrist Radiograph was advised, which showed that skeletal age / maturity of patient was more than his chronological age (confirmed with orthopedician). Denta- scan was done to know the amount of quantitative sound bone present in the area. To avoid elevation of flap again in already compromised surgical site, free hand implant surgery was planned without any bone augmentation procedure as desirable amount of bone is already present (as per denta scan). Nobel biocare active implant measuring 4.5 X 11.5 mm in dimension was placed with insertion torque of 45 Ncm, i.e. primary stability was achieved.(Figure. 9)

After cooling period of three months of osseo-integration, definitive stability of implant was measured by Osstell ISQ (Implant Stability Quotient) meter and 74 reading was obtained which states it to be highly stable.(Figure.10)

Immediately after this open tray impression were made and customized abutment was placed.(Figure. 11a,b) PFM crown was delivered on the customized abutment.(Figure. 12)

After 1 year of follow up clinical examination revealed excellent soft tissue harmony and X-rays also revealed minimal amount of bone resorption around the implant.(Figure. 13)

Discussion

Impacted teeth may pose problems of socialization, impaired function and speech which must be managed with careful treatment planning. Reasons for impaction are various such as previous trauma, tooth size arch length deficiency, physical obstruction by supernumerary tooth/odontoma/ other odontogenic tumors, cysts[12-13]. Normally

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odontomas disrupt the eruption of teeth which may be associated with retention of deciduous teeth or mal-positioning / delayed eruption of a permanent tooth or its impaction are its sequelae [14-16]. In the present scenario, the odontoma was present in the area of missing lateral incisor along with impacted canine which is situated alongside the maxillary sinus.

Although it has said that odontoma has a limited potential for growth, but its surgical removal is indicated as it is derived from tooth forming epithelial cells making it susceptible to cystic change, which may lead to extensive destruction of bone [17]. The treatment options opted vary upon clinician to clinician such as simple observation with periodic radiographs for monitoring purpose, clinical evaluation of eruption of dentition or surgical removal [18-20].

In this case we have enucleated the lesion along with the retained primary and then surgically exposed the impacted canine and placed an orthodontic attachment on the enamel surface of the tooth. As shown in the result the periodontal status of the erupted canine was acceptable with a healthy attached gingiva and proper gingival form.

In the modern era, dental implants are extensively used for replacement of missing teeth. Adequate amount of bone formation is required in the area of defect for successful implant rehabilitation. There are still controversies on the use of graft materials before implant placement in large bony defects. Review of literature presents several factors that may influence the process of bone formation. New bone develops from periosteum [21,22] which serve the osteogenic cells, [23] by acting as osteoinductors for mesenchymal cells in surrounding soft tissue. [24] It has been suggested that functional or mechanical stress on the stabilized stumps, immobilization, and a young age may have an influence in this bony regeneration process. In our case the skeletal maturity of the patient was high and bone was also reformed by retracting the impacted canine in normal position. As the patient was followed up an adequate amount of bone formation was

seen. Keeping all the points in concern placement of any bone graft material was not required and was suitable for implant placement.

Keeping into consideration the rare recurrence of the lesion and adequate bone formation in the area of the defect, a prosthetic rehabilitation was done by placement of dental implants. To the best of our knowledge, there are very few reported case in literature of dental rehabilitation of the patient with implants following excision of odontoma.

Post placement of implant, healing of the surgical site was uneventful which was followed by prosthetic rehabilitation. 1 year follow up showed excellent soft and hard tissue architecture.

Conclusion

Odontomas are the most common type of benign odontogenic tumours affecting the jaws. They are rarely symptomatic, so their detection depends on radiographic examinations. This paper highlights that despite the large clinical manifestation, surgical excision of the lesion and closure of the defect primarily, leaving the periosteum intact, a good amount of bone formation can be achieved without the use of any bone graft material and prosthetic rehabilitation can be achieved with the dental implants.

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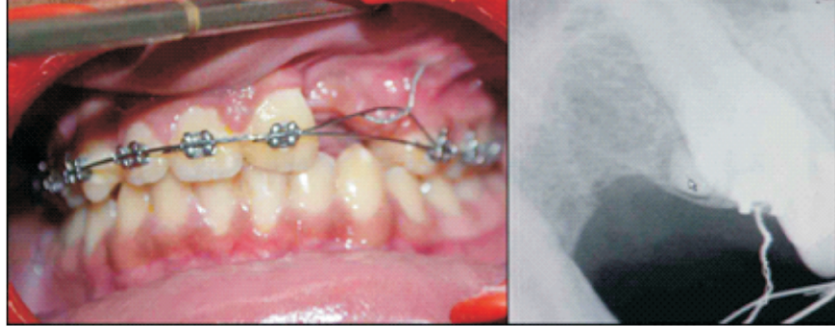
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(Figure.1 - Preoperative)



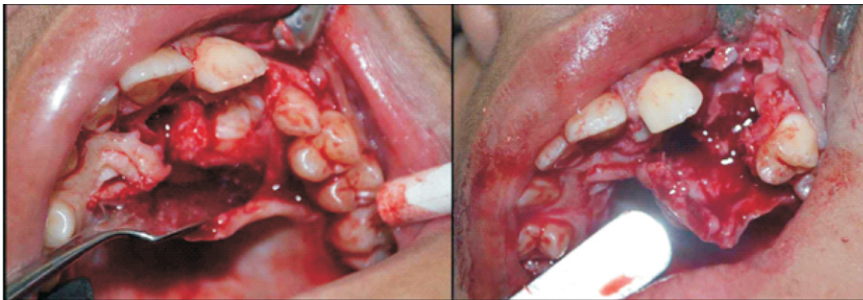
(Figure.7 - Impacted canine was surgically exposed and retraction initiated to bring it in occlusion)



(Figure.2 - OPG)



(Figure. 8 - One year through the orthodontic therapy - Canine coming in normal position)



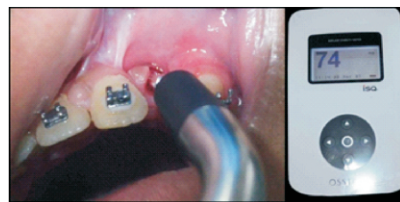
(Figure.3 - Enucleation of odontoma and extraction of retained primary canine)



(Figure.9 - Implant placed (after confirmation of bone presence by Denta scan))



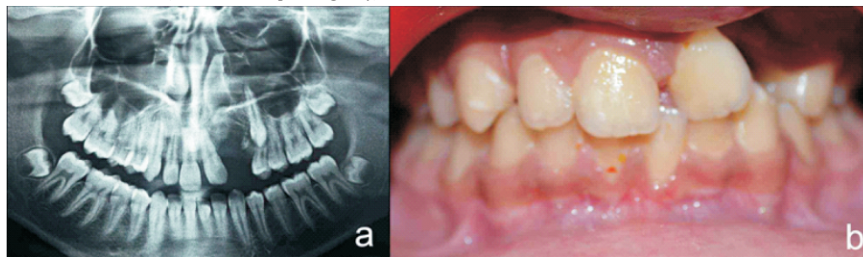
(Figure.4 - Excised Odontoma (confirmed histopathologically)



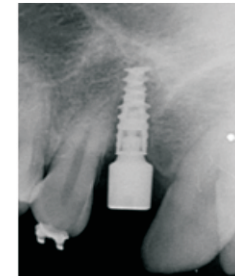
(Figure.10 - Three months later - Implant stability confirmation with Ostell)



(Figure.11 - (a)Open tray impression. (b) Customized abutment)



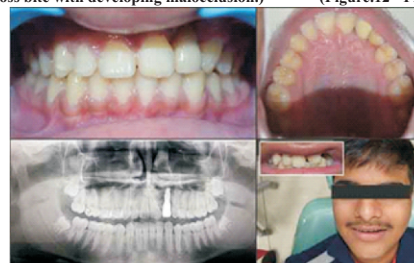
(Figure.5 - After one year later (a) OPG showing no bone in enucleated area. (b) Anterior cross bite with developing malocclusion.)



(Figure.12 - PFM crown delivered)



(Figure.6 - Fixed orthodontic treatment started)



(Figure.13 - One year follow up)