

Conservative Management of a Large Dentigerous Cyst Involving Multiple Teeth by Marsupialization and Enucleation in Conjunction with Endodontic Treatment: A Case Report

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ABSTRACT

Background: Dentigerous cyst is an odontogenic cyst associated with coronal tooth structure of unerupted or impacted permanent teeth. Treatment modalities varies from cystic decompression, marsupialization and enucleation. The diagnosis of dentigerous cyst is based on the combined clinical, radiographic and histopathological examination. This case report shows the successful outcome of conservative management of a large dentigerous cyst in an adolescent patient by marsupialization followed by enucleation and conventional endodontic treatment of multiple non-vital teeth which were in the line of the cyst, thus retaining the dentition with no loss of function and esthetics. Nine months after marsupialization, as the cyst regressed in its size, enucleation of the cyst was done by intra-oral approach. On nine months follow-up after enucleation of the cyst, clinically and radiographically the patient was totally asymptomatic and there was complete healing of the cystic lesion by the formation of bone with normal trabecular pattern with no evidence of cystic recurrence.

Keywords: Dentigerous cyst, Marsupialization, Enucleation, Endodontic therapy, Orthopantomogram.

INTRODUCTION

Dentigerous cyst is always associated with impacted, embedded or unerupted tooth.^{1,2} Clinically, patients with dentigerous cysts are asymptomatic and is often described as an incidental radiographic finding on routine radiographic examination.³ This case report presents a conservative surgical approach for the management of a large dentigerous cyst involving the lower jaw by marsupialization followed by enucleation of the cyst and endodontic treatment of multiple non-vital teeth which are in the line of the cyst.

CASE REPORT

An 18-year-old female patient was reported to the Department of Conservative dentistry and Endodontics, Triveni Institute of dental sciences, Hospital and Research centre, Bilaspur, Chhattisgarh, with the chief complaint of moderate pain and swelling on the right side of the lower jaw since one week. On intra-oral clinical examination, mandibular right canine was displaced. Extra-oral examination showed diffused swelling in the right parasymphiseal area overlying the mandibular jaw with no signs of any regional lymphadenopathy. Past medical and dental history were not significant, with no relevant history of any previous trauma to

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maxillary and mandibular jaws and an intra-oral pus draining sinus in the area of right mandibular canine since one week. [Figure: 1]



Fig 1: Pre-Operative clinical examination.

Both right and left inferior alveolar nerve function was intact and no extra-oral pus draining sinus was noticed. Inter-incisal mouth opening was normal and the occlusion was stable. OrthoPantomoGram(OPG) examination revealed the presence of a large well-circumscribed unilocular radiolucent lesion extending from mandibular right second molar to the mandibular left first molar. Mandibular left lateral incisor was vertically impacted in the symphyseal area. Mandibular right 1st and 2nd premolars, canine, lateral incisor, central incisor and mandibular left central incisor and canine were displaced [Figure: 2]

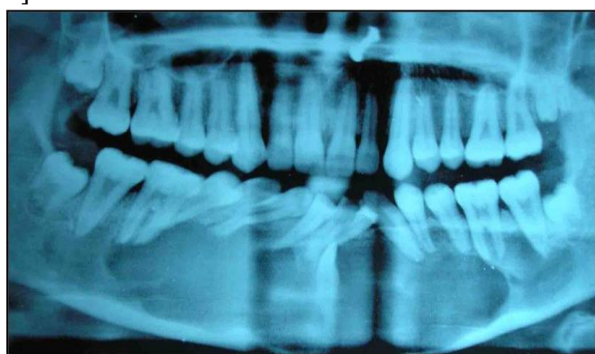


Fig 2: Pre-Operative OrthoPantomoGram(OPG).

Response of all the teeth in the line of the cyst to electric pulp vitality tests were negative, indicating that the teeth involved were non-vital. Needle aspiration was performed to establish whether the lesion was solid or cystic and straw coloured fluid was obtained on aspiration, suggestive of cystic lesion. Cyst size, site, patient age, teeth involved and involvement of vital structures in the lower jaw were considered to plan

the treatment and the entire treatment plan was explained to both patient and her parents and only on obtaining an written consent, treatment was initiated.

Marsupialization, a conservative surgical approach was preferred initially to treat the cystic lesion. After achieving adequate local anesthesia, a two centimeter long horizontal vestibular incision was made and mucoperiosteal flap was elevated. Using a mucoperiosteal elevator a window was created in the cystic lining and the cystic membrane was sutured to oral mucosa. The tissue which was removed to create the window, was placed in 10% formalin and sent for histopathological examination. Bismuth Iodoform Paraffin Paste (BIPP) gauze pack was placed into the cystic cavity and secured with suture. The medicated gauze pack was changed once in every month for over nine months time period.

Differential diagnosis included were, Odontogenic keratocyst and Unicystic ameloblastoma. Histopathological examination showed, Cystic structure lined by 2 - 4 cells thick layer of odontogenic epithelium. The cystic wall consisted of immature fibrous tissue stroma with numerous young fibroblasts. The connective tissue showed numerous chronic inflammatory cells like plasma cells, lymphocytes and a few scattered acute inflammatory cells. [Figure: 3] The final diagnosis was a dentigerous cyst.

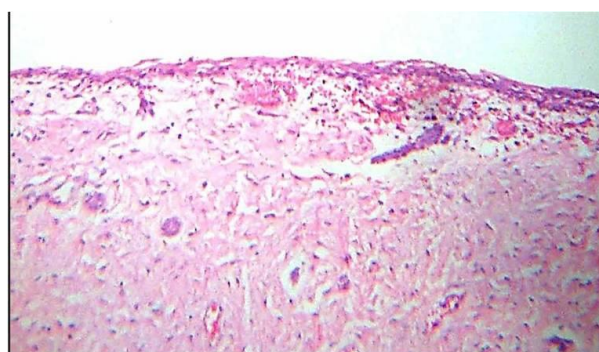


Fig 3: Histopathological examination.

Four weeks after marsupialization, the displaced right mandibular canine was extracted, as it was periodontally compromised with grade-III mobility and conventional endodontic treatment was initiated in all the teeth which were in the line of the cyst (Mandibular right 1st and 2nd molars, 1st

and 2nd premolars, central and lateral incisors, Mandibular left 1st molar, 1st and 2nd premolars, canine and central incisor). With rubber dam placed, endodontic access cavity preparation was done in all the involved teeth using high speed airoter hand piece (NSK, Japan) and Endo access bur No: 2 (Dentsply, Maillefer), root canals were located and necrotic pulp tissue was removed. Biomechanical preparation was done in all the involved teeth by crown-down technique with nickel-titanium rotary Protaper files (Dentsply, Maillefer) upto No:F2 using Tri Auto ZX2 (J. Morita) cordless rotary hand piece.

Tri Auto ZX2 is a cordless micromotor with a built-in apex locator. 17% EDTA (Ethylene Diamine Tetra Acetic acid)(Glyde,Dentsply), 3% Sodium hypochlorite (Neelkanth Health Care (P) Ltd, Jodhpur, India), 2% Chlorhexidine gluconate solution (V-Consept, Vishal Dentocare Pvt.Ltd, Ahmedabad, India) and normal saline were used as root canal irrigants. Root canals were then dried with absorbent paper points. The root canals in all the involved teeth were then coated with AH-plus sealer (Dentsply, Maillefer) and obturated with F2 Protaper gutta-percha points (Dentsply, Maillefer) and the access cavities were restored with Nano hybrid composite resin (Filtek Z250 XT, 3M ESPE) restorative material.

The size of the cystic lesion was carefully examined by Orthopantomogram once in every two months and this protocol was regularly followed. After nine months of marsupialization, as the cyst gradually reduced in its size, intra oral surgical enucleation of the cyst was performed under local anesthesia along with the extraction of the impacted mandibular left lateral incisor and the patient was prescribed with medication of Capsule Amoxicillin 500mgs, Metronidazole 400mgs thrice daily and Tablet Diclofenac pottassium 50mg twice daily for a period of five days.

The patient was on regular follow-up visits and after two months of enucleation, Clinically the surgical wound was closed primarily and wound healing was uneventful.[Figure: 4]



Fig 4: Post-Operative clinical examination: 2 months after enucleation of the cyst.

Orthopantomogram examination, 9 months follow-up after enucleation of the cyst showed complete healing of the cystic lesion along with the filling of the entire cystic space with normal trabecular pattern of bone. There was no evidence of cystic recurrence or periapical pathology in relation to any of the endodontically treated teeth. [Figure: 5]

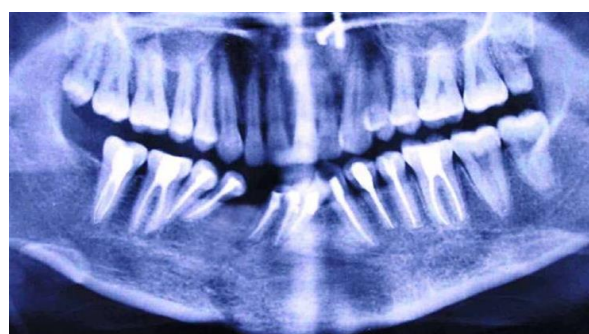


Fig 5: Post-Operative OrthoPantomoGram(OPG) (9 months follow-up after enucleation of the cyst).

DISCUSSION

Dentigerous cyst is an odontogenic cyst, often associated with crowns of unerupted or impacted permanent teeth. It develops by accumulation of fluid either between reduced enamel epithelium and enamel or in-between the layers of enamel organ and according to Main⁴, such fluid accumulation occurs as a result of pressure exerted by the erupting tooth on the follicle that obstructs the venous outflow and hence induce rapid transudation of serum across the capillary wall. However according to Toller⁴, dentigerous cysts arise by the breakdown of proliferating cells of the follicle after impeded eruption and these

breakdown products increases the osmotic pressure resulting in the formation of cyst.

Clinically, Patients with dentigerous cyst are often asymptomatic and is mainly reported as an incidental radiographic finding on routine examination.^{2,3} The diagnosis of dentigerous cyst is based on the combined clinical, radiographic and histopathological examination. Treatment modalities ranges from cyst decompression, marsupialization and enucleation.³ Treatment of dentigerous cyst should involve complete elimination of pathology with minimal surgical intervention with no loss or minimal loss of teeth. Treatment plan mainly depends upon the size of the cyst, location, extension of the cyst, number of teeth involved in the line of the cyst, age of the patient, stage of root development, position of the involved teeth in the jaw and involvement of adjacent vital structures.^{5,6}

Surgical treatment of dentigerous cysts usually involves enucleation of the lesion along with the removal of the involved teeth and this approach is more favoured in cases involving impacted third molars and other impacted teeth which are closely situated to vital anatomical structures like maxillary sinus and inferior alveolar nerve. However it is not in the patient's best interest, especially in young adolescents as extraction of multiple teeth which are in the line of the cyst will have functional, esthetic and psychological consequences.⁶

Marsupialization is described as⁵ "Unroofing the outer wall of the cyst by making a surgical incision, evacuating its contents and establishing a permanent opening by suturing the remaining part of the cystic membrane to the mucosal surface around the periphery of the opening." So in the present case, marsupialization was chosen as it is a more conservative surgical treatment approach to allow the cyst to regress in its size and then followed by the intra-oral surgical enucleation of the cyst, along with the conventional endodontic treatment of multiple non-vital teeth which were in the line of the cyst, thus retaining the dentition with no loss of function and esthetics. It took 1½ year for the complete healing of cystic lesion, which emphasizes the importance of

patient's co-operation, regular follow-up visits and close supervision by the clinician and it also highlights the potential healing of a large dentigerous cyst following marsupialization and enucleation with minimal loss of teeth which were in the line of the cyst.

CONCLUSION

This case report shows that a large dentigerous cyst involving multiple teeth was successfully treated by following a simplified surgical approach of marsupialization followed by enucleation of the cyst along with conventional endodontic treatment of multiple non-vital teeth in the line of the cyst, thus retaining the dentition with no loss of function and esthetics and there was complete healing of the cystic lesion.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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