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Dentigerous Cyst Excision: A Case Report

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Abstract

Background: Dentigerous cysts are the second most common odontogenic cysts after radicular cysts, which are characterized as unilocular radiolucent lesions and are rarely seen during childhood**.** Case Report: A 9 year old boy reported chief complaint of painless swelling in the right lower back tooth region for past 1 month. The primary mandibular right second molar was extracted, and the marsupialization technique was performed. Tissue sample was sent for histopathological examination. Clinical Significance: In this case, our clinical judgment led to the preservation of the permanent teeth considering the age of the patient, the development of tooth root and the possibility of that conservative therapeutic reduction of the intraosseous lesion and apposition of new bone to the cystic walls. Conclusion: This case report describes the conservative management of an infected dentigerous cyst with marsupialization and packing the defect with PRF and bone graft.

Keywords: Dentigerous, cyst odontogenic, cyst, marsupialization PRF, bone graft, healing.

Introduction

A dentigerous cyst is an epithelial-lined developmental cavity that encloses the crown of an unerupted tooth at the cementoenamel junction. Dentigerous cysts are the second most common odontogenic cysts after radicular cysts, accounting for approximately 24% of all true cysts in the jaws. Dentigerous cysts are frequently discovered when radiographs are taken to investigate a failure of tooth eruption, a missing tooth or malalignment. (1) They are

usually characterized as unilocular radiolucent lesions and are rarely seen during childhood. (2) There is usually no pain or discomfort associated with the cyst unless it becomes secondarily infected. Radiographs show a unilocular, radiolucent lesion characterized by well-defined sclerotic margins and associated with the crown of an unerupted tooth. While a normal follicular space is 3 to 4 mm, a dentigerous cyst can be suspected when the space is more than 5 mm. (3) The methods for treating a dentigerous cyst are enucleation and marsupialization. Marsupialization is a conservative management recommended mostly for cases associated with displaced and unerupted teeth. (4) The purpose of this report was to describe the conservative management of an infected dentigerous cyst associated with right mandibular premolar region in a 9 year old boy with marsupialization and packing the defect with PRF and bone graft for a faster and better healing.

Case Report

A 9 year old boy reported to the out-patient department of pedodontics and preventive dentistry with chief complaint of painless swelling in the right lower back tooth region for past 1 month. There was no pain on palpation and a hard swelling was present in the region of right mandibular primary second molar. Fig 1a and 1b depicts pre-operative clinical view. Orthopantomogram view (Fig.2) showed a large, unilocular radiolucency around the neck of unerupted right mandibular second premolar. The root apices of the premolar were open and there was no external resorption evident on any surrounding teeth. Clinical and radiographic examination findings displayed the lesion as a dentigerous cyst. The primary mandibular right second molar was extracted, and the marsupialization technique was performed. The cyst lining was removed and the cavity was packed with bone graft and autologous platelet rich fibrin (Fig. 3a, 3b & 4). A biopsy tissue sample was taken from the tissue removed from the cavity for histo-pathologic evaluation. This was followed by suturing with 3-0 silk sutures to close the cavity. The right mandibular second premolar was preserved and no force was applied on the tooth. Post operative instructions were given to the patient and parents and they were advised to report after one week for suture removal. Post operative radiograph (Fig. 5) showed an even distribution of bone graft in the treated cavity. After a month, patient came for follow up with no sign of swelling. On radiographic evaluation an uneven distribution of bone graft was seen resulting due to formation of bone matrix in the defect (Fig. 6). Fig. 7 depicts 3 months follow up. Bone formation is evident on the radiograph and there was no sign of swelling or any other problem clinically. Fig. 8 a & b describes the histopathological picture after the biopsy was taken. Histopathological analysis showed a fibrous cystic wall with focal mononuclear inflammatory cells lined by a thin, stratified, squamous, and non-keratinized epithelium, which confirmed the diagnosis of a dentigerous cyst.

Fig. 1a : Pre Operative Extra Oral View

Fig. 1b: Pre Operative Intra Oral View

Fig. 2: O.P.G

Fig 3a: Intra-operative view

Fig 3b: Intra-operative view

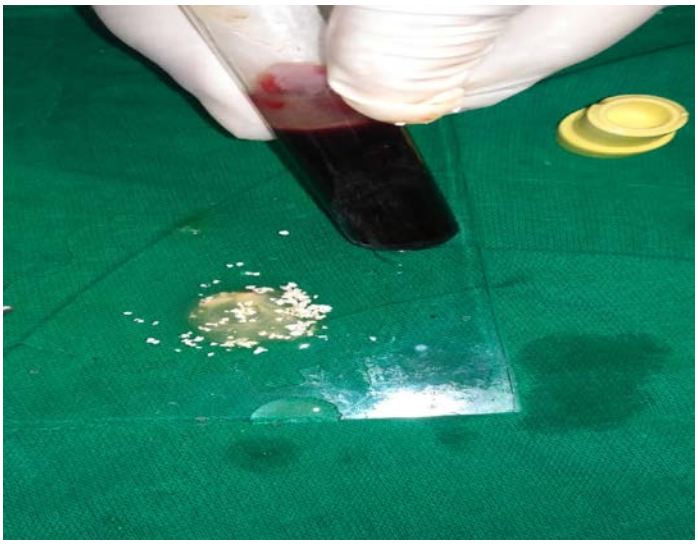

Fig. 4: PRF and Bone Graft

Fig 5: Post-operative radiograph

Fig 6: 1 month follow up

Fig. 7: 3 month follow up

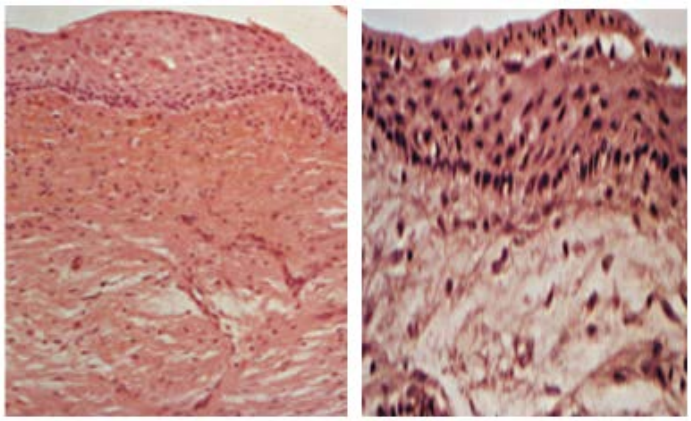

Fig 8 a & b: Microscopic View

Discussion

The origin of dentigerous cyst is still not very clear. Various theories have been proposed on the same but the occurrence of dentigerous cyst has been attributed to its development around the crown of an unerupted tooth by accumulation of fluid either between the reduced enamel epithelium and enamel or in between the layers of the enamel organ. This fluid accumulation occurs as a result of the pressure exerted by an erupting tooth on an impacted follicle, which obstructs he venous outflow and thereby induces rapid transudation of serum across the capillary wall. Many authors related them to traumatic pathology or inflammatory processes in primary teeth. (5) The substantial majority of dentigerous cysts involve the mandibular third molar and the maxillary permanent canine, followed by the mandibular premolars, maxillary third molars and rarely the maxillary premolars. Studies have shown that the incidence rate of dentigerous cysts involving the maxillary premolar was 2.7% as compared to 45.7% involving the mandibular third molar. Mourshed stated that 1.44% of impacted teeth undergo dentigerous cyst transformation, so dentigerous cysts involving the premolars are rare. Daley et al reported an incidence rate of 0.1-0.6%, whereas Shear found the incidence to be 1.5%. Dentigerous cysts most commonly occur in the 2nd and 3rd decades of life. (6) These lesions can also be found in children and adolescents and show a male predilection. (7) Other odontogenic cysts like radicular cysts, odontogenic keratocysts, and odontogenic tumors such as ameloblastoma, pindborg tumor, odontoma, odontogenic fibroma, and cemetomas may share the same radiologic features as dentigerous cysts. Microscopic evaluation is necessary most of the time to define the type of lesion. In extensive cases, radiographic view alone may not be sufficient to show the full extent of the lesions, and advanced imaging may be needed. The cysts may cause

fractures and can get secondarily infected. Metaplastic and dysplastic changes may occur. An ameloblastoma, mucoepidermoid carcinoma, or squamous cell carcinoma may develop from the lining epithelium of a dentigerous cyst. Associated aneurysmal bone cysts and hemangiomas have been reported in rare instances. (8) According to Motamedi and Talesh, the choice of the therapeutic approach should be based on the size and location of the cyst, patient age, affected dentition, and relationship with surrounding vital structures. In an attempt to preserve the tooth associated with the cystic lesion, the marsupialization technique has been successfully performed and is indicated for growing children and adolescents. This conservative procedure leads to reduction in the size of the cystic cavity and allows the spontaneous eruption of the unerupted/impacted tooth. If no treatment is performed, the cyst not only precludes the normal eruption of the affected tooth but also might cause ectopic tooth positioning, bone expansion, and facial asymmetry. (9) Platelet rich fibrin (PRF) is a fibrin matrix in which platelet cytokines, growth factors, and cells are trapped and released after a certain time that can serve as a resorbable membrane. Autologous PRF is considered to be a healing biomaterial. After activation of the platelets which are trapped within fibrin matrix, growth factors release and stimulate the mitogenic response in the bone periosteum during normal wound healing for repair of the bone. Better understanding of physiologic properties of platelets in wound healing since last two decades led to increase its therapeutic applications in the various forms showing varying results. PRF has several advantages such as it does not require any biochemical handling of blood and are also economic. Slow polymerization which is observed during PRF processing leads to the intrinsic incorporation of platelet cytokines and organic chains in the fibrin mesh to bring about efficient cell migration. This result implies that PRF, unlike the other platelet concentrates would be able to release more cytokines during fibrin matrix remodelling and use of bone graft complements the healing potential. (10,11) Reoccurrence rate is very low in case of dentigerous cysts but is still possible.

Conclusion

In the present case our clinical judgment led to the preservation of the permanent teeth considering the age of the patient, the development of tooth root and the possibility of that conservative therapeutic reduction of the intraosseous lesion and apposition of new bone to the cystic walls. Therefore, marsupialization was chosen as the treatments option with the aim to preserve the cyst-associated teeth to reliably predict the tooth eruption. The use of PRF and bone graft speeded the healing process by providing growth factors and increasing osteoblastic acitivity. The healing was satisfactory and there has been no report of pain, swelling or any other discomfort and reoccurrence till date. The authors recommend the use of PRF and bone graft in such surgical procedures for better results.

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