CASE REPORT

The Buccal Bifurcation Cyst Enigma- A Case Report

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Abstract

Introduction: The buccal bifurcation cyst (BBC) has proven to be an enigma while diagnosing cystic mandibular lesions in children. It is usually confused with entities such as Dentigerous cyst, residual cyst, etc. Only after a thorough histopathologic examination can it be rightly diagnosed.

Case Presentation: A six year old boy reported with a mandibular swelling on the right side of the jaw. It was non- tender on palpation. RVG showed a normally developing tooth 46 with normal alveolar bone. Further investigations - Ortho pantomogram (OPG) and Cone-beam computed tomography (CBCT) suggested the presence of a well- circumscribed cystic lesion with respect to the tooth 46. A conservative surgical enucleation of the lesion under local anesthesia was planned.

Management: After administering local anesthetic to achieve inferior alveolar nerve block, a muco-periosteal flap was raised in the area of interest to remove the cystic contents and lining. Flap closure was done followed by suturing and Coe-Pak dressing. The patient reported for regular follow up appointments till two years, which yielded that the surgical site and bone defect were healed with subsequent apical closure of the roots of tooth 46.

Conclusion: Meticulous diagnosis protocol and treatment planning are the mainstays of satisfactory treatment delivery in BBC. If not diagnosed properly, it may lead to the unnecessary extraction of the developmentally important first permanent molars.

Keywords: Enucleation, odontogenic cyst, permanent molar.

Introduction

The Buccal bifurcation cyst is an uncommon odontogenic cyst, which was reported for the first time in the 1980's.[1] It is usually seen w.r.t. the first or second permanent mandibular molars in the ages between 5 and 13 years.The clinical features such as swelling, infra-occlusion, delayed eruption, localized abscess and buccal tipping of the affected molar are usually seen.[2] The present case report describes the detection and management of a similar pathology in a six year old child.

Case Presentation:

A six-year-old boy reported to the Department of Pedodontics for a swelling in his right mandibular posterior region for a month. On inspection, a swelling over the buccal gingival region of tooth 46 and the right mandibular buccal vestibule was seen (Figure 1.d,e). It was having the same colour as the surrounding tissue. The swelling was hard on palpation, sessile and non-tender. Mandibular occlusal radiograph (Figure 2.a) showed buccal cortical expansion w.r.t. tooth 46. In the Pantomograph, a distinct unilocular radiolucent lesion was seen near the furcation of tooth 46 (Figure 3.a). The Cone-beam computed tomography (CBCT) (Figure 3.b) revealed a round, osteolytic lesion with dimensions of 10.3 mm x 7.8mm x 9.0 mm, situated in front of the bifurcation area of the tooth 46. The inferior alveolar nerve canal of the right side was seen to be displaced inferiorly towards the lower border of body of mandible.The provisional diagnosis of an odontogenic cyst was made, and surgical removal for the lesion sparing the tooth 46 was advised under local anesthesia. Enucleation of the cyst was perfomed under local anesthesia. Before the procedure, 5ml of blood was drawn from the patient's median cubital vein. The blood was centrifuged to obtain platelet rich fibrin (PRF). After administering the local anesthetic agent, a muco-periosteal flap was elevated in the buccal region

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of tooth 46. On elevation of the flap, a soft, round lesion was evident (Figure 4.a) between the buccal surface of tooth 46 and the bucco-alveolar bone. The bone defect caused by the cyst made for a sufficiently large surgical window to access the cystic contents within. The lesion was extending from the mesio-buccal line angle of the crown near the cervical region of tooth 46 to a point 3mm beyond the disto-buccal line angle of the crown. The lesion was removed and sent for histologic examination. The surgical site was irrigated with normal saline, and the furcation was found to be unharmed. The prepared PRF was mixed with demineralized bone graft matrix (Osseograft-DMBM-xenograft) (Figure 4.b,c) to fill the bone cavity (Figure 4.d). The flap was approximated and sutured in its original location with interrupted sutures (Figure 4.e). Coe pak (GC Pvt. Ltd.- Hyderabad, India) periodontal dressing was placed on the sutured area (Figure 4.f). The patient had an excellent post-surgical recovery and was dismissed with the usual post-surgical instructions.

Histopathological picture revealed (Figure 5.a,b) a cystic lumen lined by non-keratinized stratified squamous epithelium of varying thickness. Numerous aggregates of inflammatory cells in the connective tissue wall were noted along with extravasated RBC's. Based on the clinico-pathological, radiographic, and histological findings, the diagnosis of BBC was established.

The patient reported regularly till the two year for follow up appointment. The soft tissue healing was assessed to be sufficient at the one week and one month recall (Figure 6.b,c). Radiographic examination after six months showed adequate bone healing near tooth 46. Periapical radiograph failed to show any sign of recurrence at the 2-year follow-up.(Figure. 6.f)

Discussion

The BBC is histologically tough to differentiate from other inflammatory cysts as it is itself an inflammatory cyst of odontogenic origin.3One of the most popular theories of its etiology posits that the inflammation originating from the alveolar mucosa when the mesiobuccal cusp of the first molar pierces it, stimulates the epithelial cell rests. This theory is supported by the coincidental timings of cyst appearances and dental eruptions. The lesion's buccal location can be explained by the fact that the mesiobuccal cusp is the first to erupt in the buccal cavity. Any of the cell rests of the dental lamina, the cell rests of Serres, the cell rests of Malassez and/or the reduced enamel epithelium may proliferate and can undergo cyst

Fig. 1: Pre-operative images- a. Extra-oral image, b,c,d,e,f- intra-oral images.

Fig. 2: Investigations- a. Occlusal radiograph, b. RVG of 46.

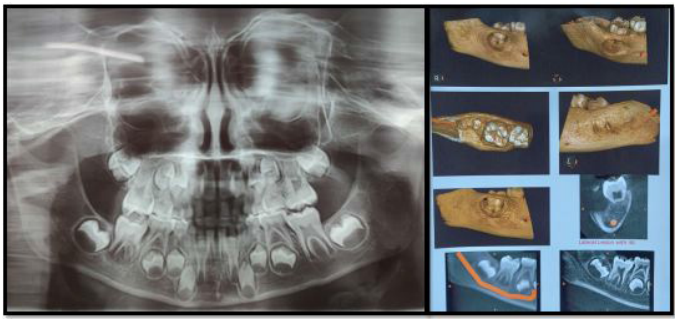

Fig.3: Investigations- a. OPG, b. CBCT.

formation.[4]

Enamel pearls may predispose plaque to accumulate in a specific area, facilitating periodontal and bone destruction progressions, which may trigger cyst development. Other hypotheses propose that these cysts are variants of the lateral periodontal cyst, that deep periodontal pockets may be the source of inflammation.[5]

In the 2022 WHO classification of odontogenic lesions, the BBC is grouped under the category of ''inflammatory collateral cysts''.[6] The characteristic radiographic features include the presence of a well-defined ovoid radiolucency near the cervical third of the roots, notinvolving the inferior border of the mandible. The histologic features arevague and exhibit a lining of non-keratinized squamous epithelial cells invaded by cells of

Fig. 4: Surgical procedure- a. Mucoperiosteal flap reflected and cystic, b. Platelet rich fibrin obtained using patient's blood, c. PRF mixed with freeze dried bone graft, d. Bone cavity packed with bone graft preparation, e. Flap repositioned and suturing done, f. Coe Pak applied on sutured mucosa.

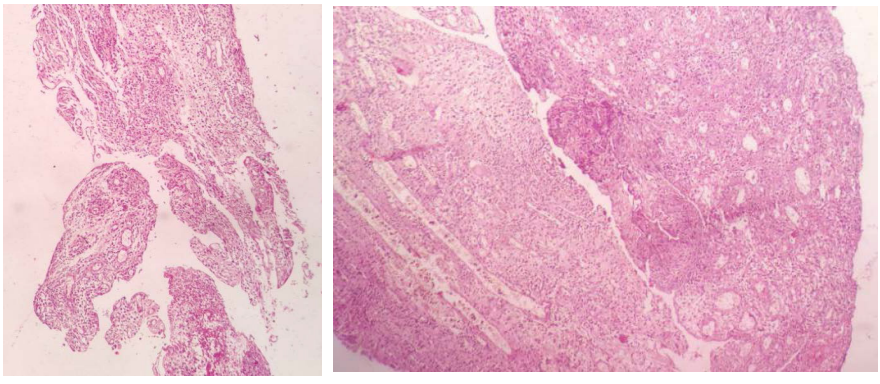

Fig. 5: Histopathological images (magnification x10)

Fig.6: Follow up images- a. Three days follow up, b. One week follow up, c. One month follow up, d. One year follow up, e. Two year follow up, f. Two year follow up RVG of 46

chronic inflammatory origin.[7]

Since the advent of CBCT, the visualization of this lesion has improved, which makes it easier to interpret the size as well as contiguity of the lesion to neighboring anatomical structures. The clinical and radiographic features of the cyst contribute to the characteristic features that secern it from other similar entities. The clinical features include buccal tipping of the lingual cusps along with a swelling present on the buccal region of the affected tooth.

The histological features of BBC hinted at an inflammatory cyst of dental origin. Hence the diagnosis of BBC was made by correlating clinical, radiographic, and histopathologic findings.[8,9]

The differential diagnoses for BBC are- dentigerous cyst, unicystic ameloblastoma, odontogenic keratocyst, eosinophilic granuloma, central giant cell lesion, lateral periodontal cyst, idiopathic bone cavity, and lateral periapical cyst.5 Radicular cyst can also be considered as a differential diagnosis in carious mandibular molars.[10]

In the present case, the 24- month recall appointment showed that the first mandibular molarerupted completely till the occlusal plane (Figure 6.d,e) and its roots developed normally (Figure 6.f). Also the bone in the affected area showed complete healing, and no recurrence of the lesion.

The first line of treatment for BBC has evolved significantly from extraction of molar and socket currettage in the last couple of decades.[11] In the recent times, the techniques such as curettage or enucleation, sparing the associated molar, are propounded. Newer techniques such as micro-marsupialization,[7] and periodontal irrigation portrayed encouraging results in many cases.

Conclusion

The BBC is an enigma to diagnose. Incomplete history, and radiographic investigation leads to a diagnosis being made based on its vague histopathology. It can result in a hasty diagnosis and the subsequent removal of a molar that plays a crucial role in maintenance of a balanced occlusion as well as dento-skeletal growth.

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