ABSTRACT

Background: The buccal bifurcation cyst is an often confusing inflammatory cyst that occurs in young children between the ages of 5.5 years to 11 years predominantly in relation to the mandibular first molars. Though the histological picture is non-specific, it can be clearly distinguished by the presence of very distinct clinical and radiographic features. Giving undue importance to the histological features without a proper clinical and radiographic examination can result in loss of a tooth which is extremely vital for maintaining skeletal and dental symmetry.

Case Report: A 9-year-old boy presented with a mildly tender, unilateral swelling on the left side of his lower face. The case report discusses the investigation protocol followed in this case with an impetus on cone-beam computed tomography and also adds a note on adjunctive aids like ultrasonography and immunohistochemistry and their relevance to the diagnosis.

Conclusion: The advent of cone-beam computed tomography has made it easier to examine the buccal bifurcation cyst. This is extremely relevant to this entity as misdiagnosis can lead to unwarranted removal of a tooth that is important for the maintenance of a balanced occlusion.

Keywords:
Buccal bifurcation cyst, odontogenic cyst, inflammatory collateral cyst, paradental cyst
INTRODUCTION

The buccal bifurcation cyst is an age- and site-specific inflammatory collateral cyst of odontogenic origin, which has been described variously as mandibular infected buccal cyst, juvenile paradental cyst, mandibular buccal bifurcation cyst, inflammatory lateral periodontal cyst, circumferential dentigerous cyst and inflammatory paradental cyst in literature.\(^1\)\(^-\)\(^3\) It specifically occurs in the mandible in relation to the buccal surface of the first molar and rarely the second molar in children between 5.5 to 11 years of age (mean = 7.5 years) with about 37.5\% of the cases occurring bilaterally.\(^4\)\(^,\)\(^5\) It is analogous with the paradental cyst that occurs in association with third molars affected by a previous episode of pericoronitis as also with a similar entity reported on the buccal surface of mandibular premolars.\(^6\) All of these are collectively referred to as inflammatory collateral cysts according to the 4th edition of the WHO classification of head and neck tumours.\(^2\) The diagnosis of the buccal bifurcation cyst gains importance as it is often overlooked despite the presence of distinct clinical and radiographic features.\(^7\) Below is described a case as well as a review of literature of this interesting lesion.

CASE REPORT

A 9-year-old male patient reported a swelling on the left side of his lower face that waxed and waned in size over a month with associated dull pain. Intraoral examination revealed a dome-shaped swelling of size approximately 1 cm x 2 cm associated with the partial eruption of the lingual cusps of the crown of the left mandibular first molar (Figure 1). There was no sign of colour change or suppuration but palpation revealed a hard and mildly tender mass in the area. Tooth number 36 tested vital to electric pulp testing causing further concern.
Suspecting a bony lesion, a panoramic and occlusal radiograph were prescribed and examined. The occlusal radiograph (Figure 2) showed expansion of the buccal cortical plate with loss of continuity in the margin in relation to tooth number 36 indicating a perforation. This was surrounded by a mild periosteal bone reaction. The panoramic radiograph (Figure 3) showed dental caries in relation to tooth number 74 involving the pulp; however, there was no dental caries or periapical pathology in relation to tooth number 36. Presence of bone loss in relation to the cervical region of the distal aspect of tooth number 36 which extended to the coronal aspect of unerupted tooth number 37 was also seen.
Due to the limitations of the two-dimensional images in providing vital information in the coronal plane that could lead to an estimation of the extent and epicentre of the lesion, it was decided that Cone-Beam Computerized Tomography (CBCT) was necessary and was therefore requested. The CBCT image sections showed a well-defined, osteolytic lesion with irregular borders and maximum dimensions of 11.21 mm (medio-laterally) x 8.24 mm (bucco-lingually) x 8.04 mm (superio-inferiorly) situated buccal to the bifurcation area in relation to tooth number 36 with distal extension to the mesial aspect.
of developing follicle of tooth number 37. The lesion had resulted in a prominent expansion of the buccal cortical bone with concomitant tilting of the roots of the related tooth toward the lingual cortex. Additionally, the periosteal reaction was well visualized in the form of a multi-laminate onion peel appearance. Taking the age, and the clinical and radiographic features into consideration a clinical diagnosis of Buccal Bifurcation Cyst was made. The child was subsequently referred for surgery where the cyst was enucleated preserving tooth number 36. Healing was uneventful during subsequent follow up at 2 weeks and 6 months.

Figure 4a: Axial CBCT section showing periosteal reaction with onion-peel appearance

Figure 4b: Axial CBCT section showing expansion and perforation of buccal cortical plate with concomitant lingual displacement of roots of tooth number 36

Figure 4c: Sagittal CBCT section showing the relationship of the cyst with the tooth. Note how the cyst is related to the cervical third of the roots

Figure 5: 3D reconstruction showing the extent of the lesion
DISCUSSION

The buccal bifurcation cyst is an inflammatory cyst of odontogenic origin occurring in children between the ages of 5.5 to 11 years and is therefore indistinguishable histologically from other inflammatory cysts.\(^1,5\) The most popular pathogenesis hypothesizes that the inflammation originating from the alveolar mucosa when the mesiobuccal cusp of the first molar penetrates it, stimulates one of the various epithelial cell rests that include those of the dental lamina, the cell rests of Serres, the reduced enamel epithelium and the cell rests of Malassez causing them to proliferate and ultimately undergo cystic degeneration.\(^8–10\) In this respect it is analogous with the paradental cyst of the third molar which originates due to stimulation of the same rests by an episode of pericoronitis.\(^5,7\)

The histological picture is non-specific and shows a lining of non-keratinized squamous epithelial cells infiltrated by chronic inflammatory cells such as lymphocytes and plasma cells.\(^1,9,11\) It is therefore the clinical and radiographic features brought about by the expanding cyst that contributes to the hallmark features that distinguish it from other entities. The clinical features include buccal tipping of the lingual cusps along with a mildly tender swelling present on the buccal aspect of the associated tooth.\(^1,8,12\) More often than not, the eruption pattern of the tooth is also altered.\(^5,9,13\) Careful examination may lead to further evidence of a periodontal pocket of >4 mm involving the buccal aspect of the affected tooth.\(^13\) Despite all this, the tooth is always vital when tested using one of the various methods used to test pulp vitality.\(^1,9,13,14\)

The distinguishing radiographic features include the presence of a round to oval radiolucency associated with the cervical third of the buccal surface of the roots that do not involve the inferior border of the mandible.\(^5,9,11\) The radiolucency displaces the concerned roots lingually towards the lingual cortical bone sometimes perforating it.\(^12,13,15\) Occlusal radiography also shows buccal cortical expansion with the associated periosteal reaction that may be single layered or multi-layered giving it an onion-peel appearance.\(^5,12\)

The recent advent of CBCT has made the visualization of this lesion in 3 dimensions easier to understand and interpret especially with respect to the extent of the lesion as
well as its proximity to vital anatomical structures. Of late, ultrasonography has also been used and an attempt has been made to employ immunohistochemistry to identify this lesion but in the present scenario, they can at best be used as adjuncts to help with diagnosis. It must be differentiated from other inflammatory cysts such as the radicular cyst which is always associated with a non-vital tooth, the lateral periodontal cyst/abscess which occurs in older individuals and the dentigerous cyst which completely envelops the crown of the tooth.

Treatment favours a conservative approach which involves enucleation of the cyst and retention of the associated tooth in contrast to earlier surgical approaches which involved removal of the associated tooth. Considering the vitality of the first molar as well as its role in the maintenance of a balanced occlusion, a conservative approach leads to a more favourable outcome. Some authors have also proposed micromarsupialization which involves daily irrigation through the pocket leading to a resolution of the lesion, while others have talked about lesions that have self-resolved without any intervention.

CONCLUSION

The buccal bifurcation cyst is an entity that is often mistaken for other lesions. An improper history, physical and radiographic examination can lead to a diagnosis being made based on the non-specific histological picture which can be misleading and can ultimately result in the loss of a tooth that is considered important for maintenance of a balanced occlusion as well as dental and skeletal symmetry. CBCT has made diagnosis of this lesion easier and will hopefully lead to improved patient care.
REFERENCES


