Cystic Lesion In Relation To Impacted Maxillary Third Molar: A Diagnostic Dilemma

Abstract: Periapical cysts are the most common inflammatory odontogenic cyst of the jaws with a prevalence of 52-68%. Trauma or dental caries is the most common aetiology for occurrence of such cystic lesions. Most commonly they are associated with the maxillary anterior teeth and are very rare in the maxillary third molar region. Here, we report a rare case of a radicular cyst associated with a partially erupted maxillary third molar, which could be a diagnostic dilemma.

Keywords: Cystic Lesion, Partially Impacted third molars.

INTRODUCTION

A cyst is a pathological, epithelial-lined cavity containing fluid or semi-fluid which arises from the epithelial remnants of tooth formation. The 1992 World Health Organization (WHO) classification of odontogenic cysts is widely recognized and categorizes them as developmental or inflammatory in nature (Nayyer, N. V. et al., 2015). Inflammatory odontogenic cysts include the radicular cysts and the lateral periodontal cysts (Deshmukh, J. et al., 2014). Radicular cysts (apical periodontal cyst, dental root end cyst) are the most common inflammatory odontogenic cysts of tooth bearing areas of the jaws (Deshmukh, J. et al., 2014). They originate from an epithelial rest of Malassez in periodontal ligaments secondary to inflammation (Deshmukh, J. et al., 2014). They are most frequently found at the apices of the involved teeth with infected or necrotic pulps; however, they may also be found on the lateral aspects of the roots in relation to accessory root canals (Deshmukh, J. et al., 2014). Prevalence of the radicular cysts in the maxilla is 60% as compared with mandible, and are most commonly found in the incisor and cuspid region (Stuart, C., & White, M.J.). Here, we report a rare case of inflamed radicular cyst associated with a partially erupted maxillary third molar.

CASE REPORT

A 59 year old male patient reported to our department with a chief complaint of pain in the upper left back tooth region since 15 days. Patient revealed that the pain had reduced. On examination, there was no presence of 2 linear ulcers in the retromolar region in 38 and buccal vestibule of 28 respectively, measuring about 1 x 1 cm in size, with sloping margins, and yellowish floor (Fig 2) and were non-tender and had non-indurated base. The marginal and attached gingiva was soft and edematous in relation to 28. Detailed hard tissue examination showed normal compliment of teeth in the maxillary and mandibular arches. 28 was partially erupted and had grade I mobility, and the disto-buccal cusp in relation to 27 was sharp.

Fig 1: Extra-Oral photograph

Fig 2: Erythematous mucosa in the region of 28
Based on the above clinical findings, a provisional diagnosis of traumatic ulcer on the left buccal mucosa in relation to 28 and 38 and localised periodontitis in relation to 28 was considered.

Pulp Vitality testing was done in relation to 27, which revealed the tooth showed no response, i.e it was non vital.

An intra-oral periapical radiograph was taken in relation to 27 and 28 which revealed, presence of a solitary diffuse radiolucency, distal to 27 and mesial to the crown and root of 28. There was complete loss of lamina dura in relation to all the roots of 27 and 28. (Fig 3).

![Fig 3: Intra-Oral Periapical Radiograph showing a solitary, diffuse radiolucency present distal to root of 27 and mesial to root of 28.](image)

A cone beam computed tomography (CBCT) was taken in relation to left maxilla, the PAN view revealed a solitary periapical radiolucency, oval in shape, measuring 2cm in its greatest diameter and extending from disto-buccal root of 27 to posterior border of the left maxilla and superiorly from the maxillary sinus to the alveolar bone with well demarcated and corticated borders (Fig 4).

![Fig 4: Orthopantomograph and cropped PAN image showing the radiolucency with corticated borders and extending distal to 28.](image)

![Fig 5: Sagittal Section showing the radiolucency is causing compression of the floor of left maxillary sinus.](image)
Fig 6: Coronal and Axial Section shows loss of buccal cortical plate in 28, and elevation of the floor of maxillary sinus.

The sagittal view showed, superior portion of the lesion extending into the maxillary sinus with areas of intermittent border (Fig 5). In the coronal section, there is loss of buccal cortical plate in 28. With elevation of the floor of maxillary sinus (Fig 6). The sinus also shows soft tissue thickening of about 2cm. There is complete loss of lamina dura and periodontal ligament space around the roots of 28. There was no evidence of root resorption. Based on the radiographic findings, the diagnosis of inflammatory periodontal cyst was considered.

Enucleation of the cystic lesion was planned along with extraction of the maxillary third molar and removal of sinus lining of left maxillary sinus, which was done under local anaesthesia. Excisional biopsy was also done for the traumatic ulcers on left buccal mucosa. The tooth 27 was also extracted.

Macroscopically, there was presence of greyish white soft tissue mass measuring about 2.5 x 1 x 0.5 cm.

Microscopically, cystic contents showed presence of ulcerated cystic lining of squamous epithelium with granulation tissue and dense, chronic inflammatory cell infiltrate in the connective tissue. The lining of maxillary sinus showed ciliated columnar mucin secreting epithelium lining fibro vascular connective tissue and tissue from ulcers on left buccal mucosa showed no dysplasia.

Based on the above histopathological findings, we considered a final diagnosis of inflammatory radicular cyst in relation to 27 and partially erupted 28.

**DISCUSSION**

Radicular cysts are so far the most common of the cystic lesions that occur in the jaw (Kumar, S. et al., 2019). They are also known as periapical cyst, root end cyst or dental cyst, originates from epithelial cell rests of Malassez in periodontal ligament because of inflammation due to trauma or pulp necrosis (Lim, A. A. T., & Peck, R. H. L., 2002).

The cystic cavity with epithelial linings that are open to the root canal is considered as a bay cyst (Nair, P.N. 1998), whereas a cystic cavity with complete epithelialization but no opening into the apical foramen and root canal is regarded as an apical cyst. Sometimes, the cyst may appear on the lateral aspect of the root when the lesion is associated with lateral accessory root canals (as in our case).

Chronic trauma or injuries to teeth irritate the pulp of involved teeth which lead to necrosis and furthermore chronic apical periodontitis which causes cells to proliferate and initiate cystic degeneration within the cyst cavity lined by a epithelial lining (Singhal, I. et al., 2016). Based on the opening or connection of the root canal to the epithelial-lined cavity, periapical cyst are categorized into bay cyst or apical cyst (Nair, P.N. 1998). The cystic cavity with epithelial linings that are open to the root canal is considered as a bay cyst (Nair, P.N. 1998), whereas a cystic cavity with complete epithelialization but no opening into the apical foramen and root canal is regarded as an apical cyst. Sometimes, the cyst may appear on the lateral aspect of the root when the lesion is associated with lateral accessory root canals (as in our case). Among all the jaw cysts, radicular cysts make up about 52%–68% (Ramachandran Nair, P. N. 2003; & Nilesh, K. et al., 2015).

These cystic lesions are higher in third decade of the life (Kumar, S. et al., 2019). They are more common in males compared to females with a ratio of 1.6:1 (Nair, P.N. 1998). It involves both the primary and permanent dentition with a range of 0.5%–3.3%. Prevalence of the radicular cysts in the maxilla is 60% as compared with mandible (Deshmukh, J. et al., 2014). In the Maxilla, anterior teeth are most prone to the cyst. In the mandible, premolars are commonly affected (Kumar, S. et al., 2019). Incidence of cysts occurring in the impacted third molars varies from 0.001% to 3.1%, and dentigenous cysts are the most prevalent types of diagnosed cysts (Kumar, S. et al., 2019).

Clinically, most of the cases of periapical cysts are asymptomatic. Most of them are usually discovered in the periapical radiographs of symptomatic tooth. They show slow enlargement. In the maxilla there may be buccal or palatal enlargement. Pain and infection may also be seen in some cases (Kumar, S. et al., 2019).

Fine needle aspiration cytology can be done as a chair side investigation for cystic lesions. The cystic content may vary from a clear, yellow-coloured fluid to a solid cheese-shaped lump. Total protein content is usually between 5 and 11 g/100 ml (Koju, S. et al., 2019).
The classic radiological description of radicular cyst is, round or ovoid radiolucent mass covered by a thin, radio-opaque lining which extends from the lamina dura of the involved tooth. The size of the lesion is above 1.6 cm in greatest diameter (Shear, M. 2007). Most teeth with periapical cysts are associated with some degree of external root resorption near to the apex of the root. In the maxilla, the cyst may invaginate the sinus, but there typically is evidence of a cortical boundary between the contents of the cyst and the sinus cavity. The outer cortical plates of the maxilla or mandible may expand in a curved or circular shape (Stuart, C., & White, M.J. Pharoah). In our case, the cyst pushes the floor of the left maxillary sinus.

Microscopically, the lining is formed by 6 to 20 layers of stratified squamous epithelium. The inflammatory cell infiltrate shows plenty of polymorphonuclear leukocytes whereas the adjacent fibrous capsule is infiltrated by chronic inflammatory cells (Shear, M. 2007).

Rushton bodies (hyaline) are observed occasionally, and these are described as cuticular or keratin-like products of odontogenic epithelium. These form as a result of entrapment of blood vessels within the epithelium, resulting in vascular thrombosis (Shear, M. 2007).

The treatment of the radicular cyst depends on the size and localization of the lesion, the bone integrity of the cystic wall and its proximity to vital structures (Kadam, N.S. et al., 2014). It includes conventional nonsurgical root canal therapy when lesion is localized or surgical treatment like enucleation, marsupialization or decompression when lesion is large (Kadam, N.S. et al., 2014). Enucleation can be planned for large cysts, which includes a Conservative approach involving the removal of the infected tissues as compared to procedures like En bloc resection, which involves removal of the normal structure along with diseased tissue (Kadam, N.S. et al., 2014). For smaller lesions, root canal treatment can be planned to facilitate healing (Kadam, N.S. et al., 2014). The use of root canal dressings between sessions in root canal treatment of such teeth, is important, for reducing bacteria which are unreachable by instruments or irrigation solutions, such as dentinal tubules and ramifications (Koji, S. et al., 2019). In our case, the treatment of choice was surgical enucleation and curettage followed by extraction of the maxillary second and third molar, as the lesion was also involving the maxillary second molar.

One of the complications associated with a poor prognosis of radicular cyst is the occurrence of malignant transformation of the lining epithelial cells. One report in the literature describes the formation of squamous odontogenic tumor-like proliferations within the lining of radicular cysts. These occurrences have been observed in around 3.4% of the cases studied. Radicular cyst of the maxillary region was the most common site, showing such transformation. Therefore, the treatment of radicular cysts should be prompt to avoid any potential complications (Koji, S. et al., 2019).

REFERENCES