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ABSTRACT

The maxillofacial region is affected by more cysts than any other part of the body. They are the most common odontogenic cyst of inflammatory origin. Radicular cysts are usually asymptomatic, hence they are often discovered incidentally on routine radiographs as round, well corticated radiolucency at the apex of root. However, the clinical and radiographic picture may vary. This is a report of two cases of radicular cyst, with different clinical and radiographic features necessitating different lines of treatment.

KEYWORDS: Odontogenic cyst, radicular cyst, periapical cyst, jaw cysts

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INTRODUCTION:

A cyst is a space-occupying lesion with an outer wall of fibrous connective tissue that surrounds a central cavity called the cyst lumen. On the inner aspect of the wall is a lining of epithelium, most commonly stratified squamous epithelium.¹ Odontogenic cysts are the most common form of cystic lesions that affect the maxillofacial region. They are classified into an inflammatory group including radicular cysts and a developmental group, which includes keratocysts and dentigerous cysts.² A radicular cyst is generally defined as a cyst arising from epithelial residual cells (cell rests of Malassez) in the periapical periodontal ligament as a consequence of inflammation, usually following the death of dental pulp.^{1,3,4}

Radicular cysts are believed to be formed from epithelial cell rests of Malassez (ERM), which are remnants of Hertwig's epithelial root sheath, present within the periodontal ligament. Proliferation of these epithelial cell rests is frequently associated with stimuli from periapical periodontal inflammation secondary to pulpitis.^{1,5} During periapical inflammation, host cells in the periapical tissues release many inflammatory mediators, pro-inflammatory cytokines, and growth factors which induce proliferation of the ERM in all directions to form a three dimensional ball mass. As the epithelial mass grows, the central cells move further away from their source of nutrition and undergo necrosis and liquefaction degeneration, forming a central cystic cavity lined by epithelial wall.⁵ Following its formation, radicular cysts grow by periapical bone resorption

mediated by prostaglandins and cytokines.⁵

It is the most common of all the jaw cysts and comprises about 52% to 68% of all the cyst affecting the human jaw.⁶ Almost all radicular cysts are lined partially or completely by non-keratinized stratified squamous epithelium.³

Radicular cyst's prevalence is highest among patients in their third decade of life, and higher among men than women.¹ These cysts can occur in the periapical area of any tooth, at any age but are seldom seen associated with the primary dentition. Anatomically, the apical cysts occur in all tooth-bearing sites of the jaws but are more frequent in maxillary than mandibular teeth.^{1,4}

Most of the radicular cysts are symptomless and are discovered when periapical radiographs are taken of teeth with non-vital pulps.^{1,3} Radiographically, most radicular cyst appear as round or pear shaped unilocular radiolucent lesion in the periapical region, particularly those over 2 cm in size.^{1,3} Root-end filling materials are applied after surgical root canal treatment to achieve a good apical seal that prevents egress of potential contaminants into periradicular tissue.⁷

These two cases have totally different clinical and radiographic picture with different treatment modalities.

CASE REPORT

CASE 1

A 55 year old male Hindu patient came to the OPD of Oral Medicine and Radiology department of the institute with the complaint of swelling in the palate

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since last 4 days. Patient had a history of trauma before 20 years due to an accidental fall from the bike leading to a blow to his face. There was bleeding from maxillary anterior region of mouth. Since then, he was asymptomatic until he noticed a swelling in the anterior hard palate region before a week. Before 4 days, patient noticed an increase in size of the swelling **[Figure 1]**.



Figure 1: Intraoral photograph showing swelling on hard palate

Patient had a habit of smoking 20-25 bidis per day since last 40 years. On examination, a mesiodens was present. Also, there was a single, round swelling measuring 1 cm in diameter on right side of the hard palate extending mesio-distally from mesial of 11 to distal of 14 and antero-posteriorly from the level of maxillary canine to second premolar. The overlying mucosa was red without any sinus tract or fistula. On palpation, the swelling was non-warm, tender, soft in consistency, non-compressible & non-fluctuant. Provisional diagnosis for this case was infected radicular cyst in relation to 11, 12

On pulp vitality testing, there was no response in relation to 11, 12. Maxillary occlusal radiograph showed a single, oval, well defined radiolucency with, 1 x 1.5 cm size present on the right side of hard palate not crossing the midline.

[Figure 2] It was surrounded by a thin radiopaque corticated border involving the 1/3rd of root apex of 12, apex of 11 and extending to the distal of the 16. Orthopantomogram shows a single round 2 cm diameter sized radiolucency with corticated borders centered over the apical third of roots of 12 and 13.



Figure 2: Maxillary anterior occlusal radiograph showing round radiolucency in 11,12 region

[Figure 3] FNAC macroscopic examination showed blood tinged yellow coloured fluid with approximate 1.5 ml volume. **[Figure 4]**



Figure 3: Orthopantomograph showing radiolucency with radioopaque borders related with roots of 12,13



Figure 4: Macroscopic examination showing blood tinged yellow fluid

The patient was advised root canal treatment for 11, 12 & 13 followed by apicoectomy for cyst enucleation. The specimen was sent for histopathological examination.

Histopathological examination showed that the epithelium was stratified squamous in nature with underlying connective tissue stroma showing dense collagen fibers with fibroblasts, large number of inflammatory cells & blood filled capillaries.

[Figure 5]

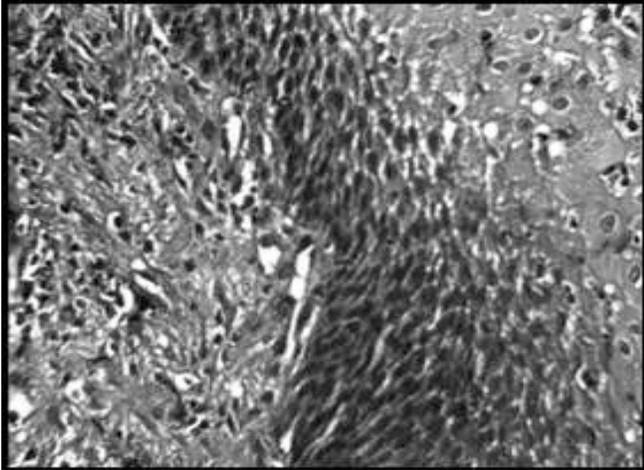


Figure 5: Microphotograph showing stratified squamous epithelium & connective tissue

CASE 2

A 48 year old Hindu female patient came to the OPD Oral Medicine and Radiology department of the institute with complaint of decay in lower left back tooth region of jaw since last 1 year. Patient had undergone silver amalgam restoration before 3 – 4 years as she noticed caries in that tooth. Then the restoration got dislodged by itself before 2 years. Patient also had a habit of chewing 3 – 4 betel nuts per day since last 15 to 20 years. On examination, 36 was grossly carious.



Figure 6: Intraoral photograph showing grossly carious 36

[Figure 6] However, none were tender on percussion. A provisional diagnosis of chronic irreversible pulpitis in relation to 36 was given.

On checking vitality there was no response in relation to 36. IOPA of 36 showed a radiolucency involving enamel and dentin reaching pulp. Also, radiopaque gutta purcha cones were present in mesio-buccal and mesio-lingual canals of 36. Periapically, a single, round, well defined radiolucency 1 cm in diameter was present on the apex of mesial and distal roots which was surrounded by well-defined radiopaque corticated border.



[Figure 7] Orthopantomogram shows a single round radiolucency with radiopaque borders from mesial aspect of root of 36 to mesial aspect of root of 37 and supero-inferiorly from 1/3rd of root to mandibular canal. **[Figure 8]**



The patient was advised extraction followed by cyst enucleation. The specimen was sent for histopathological examination. **[Figure 9]**

Histopathological examination showed stratified squamous epithelial in arcading pattern with loosely arranged underlying connective tissue stroma. Large number of inflammatory cells were also evident.

DISCUSSION

The radicular cyst has been classified as inflammatory, because in the majority of cases it is a consequence to pulpal necrosis following caries, with an associated periapical inflammatory response.³ It is also called radicular cyst, apical periodontal cyst or dental cyst.⁸ A radicular cyst is associated with carious, non-vital, discoloured or fracture tooth.⁴ Position of the maxillary anterior teeth makes them more prone to injury and subsequent pulp necrosis.⁵ In the first case, trauma to maxillary anterior teeth was the cause. Periapical inflammation and pulpitis secondary to dental caries is another cause of formation of radicular cyst.⁵ In the second case, grossly carious tooth was the cause for developing radicular cyst.

Few studies in the UK and the South African population have shown that radicular cysts occur more commonly between the third and fifth decades of life, more common in males than females, and more frequently found in the anterior maxilla than other parts of the mouth.^{2,3} In the first case age of the patient was 55 years, but the trauma occurred before 20 years while in the second case the patient was aged 48 years.

The initial swellings of these radicular cysts are usually bony hard, but as they increase in size, the covering bone may become very thin despite initial sub-periosteal bone deposition.^{2,3} Most of the radicular cyst are symptomless and are discovered when periapical radiograph is taken of teeth with non-vital pulps.¹ Patient often complains of slowly enlarging swellings.¹ In the first case swelling was

present with non-vital tooth and in second case there was symptomless carious non-vital tooth.

Radiographically, most radicular cysts appear as round or pear shaped unilocular radiolucent lesion in the periapical region.² In first case radiolucency was pear shaped at periapical region of 12 and in second case radiolucency was round in shape at periapical region of 36.

Macroscopically, fluid aspirated from the periapical cysts is of yellowish-white in color and contained cholesterol crystals.⁵ This is in accordance with the findings of the first case.

The treatment options for large periapical lesions range from conventional non-surgical root canal treatment with long treatment with long term calcium hydroxide therapy to various surgical interventions.⁶ The first case was treated by root canal treatment followed by apicoectomy which is the ideal plan of treatment for large cysts involving multiple teeth whereas the second case required extraction because much of the involved tooth had already lost its crown structure due to carious destruction over a period of time.

CONCLUSION

Radicular cyst is the most commonly occurring cyst. Different type of cases is differentiated by radiographically and histopathological examination. So, preoperative radiograph should be taken whenever needed whether the patient is asymptomatic or symptomatic. This will does help to provide an inadequate diagnosis and does proper treatment plan for the patient.

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