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CASE STUDY

INFECTED RADICULAR CYST IN PRIMARY TOOTH

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ABSTRACT

Radicular cyst associated with primary teeth is a rare condition. This report presents a case of radicular cyst associated with primary tooth which had deep carious lesion involving the pulp and untreated for long duration. The treatment of the cystic lesion consisted of extraction of the involved tooth and enucleation of the cyst.

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INTRODUCTION

Radicular cyst also known as Periapical cyst is one of the most common cystic lesions found in the jaws especially associated with permanent teeth and rarely associated with primary dentition. The most common cause being neglected carious lesions. The cyst is always succeeded by the longstanding Periapical infection. (Verghese George *et al*.,) These lesions are mixed inflammatory reactions with the chronic granulomatous inflammatoryreaction being the predominant type observed. These lesions may contain epitheliumsuggesting the potential for cystic transformation. Radicular cysts are odontogenic cysts which are derived from the inflammatory activation of epithelial root sheath residues (cell rests of Malassez). They are inflammatory in nature and usually arise within a periapical granuloma relating to stimulation resulting from a necrotic tooth. In the past, occurrence of radicular cysts in the primary dentition has been considered as rare. Radicular cysts are rare in the primary dentition, representing only 0.5–3.3% of the total number in both primary and permanent dentitions. Lustmann and Shear in an extensive review from 1898 to 1985, found only 28 cases to which they added 23 cases and prevalence of radicular cysts in primary dentition was reported to be less than 1%. However, Mass *et al* analysed 49 primary molar teeth with radiolucent lesions ranging from 4-15 mm in diameter and 73.5% of all lesions were diagnosed as radicular cysts and 26.5% as granulomas. Various reasons cited for this relative rarity include presence of deciduous teeth for a short time, easy drainage in deciduous teeth due to the presence of numerous accessory canals and a radicular radiolucency in relation to deciduous teeth areusually neglected. Additionally, the lesions tend to resolve on their own following theextraction/exfoliation of the associated tooth and are generally not submitted for histopathological examination. (Namdev *et al*., 2015)

Case report

A 6 yrs old female patient reported to the Department of Pedodontics and Preventive Dentistry with the complaint of pain in lower right back tooth region since one year. Pain was localized intermittent dull non radiating type aggravated on having food and relieved on taking medicines. Also gave as history of swelling since one year. Medical history, past dental history and family history were non-contributive to the presenting case. Patient was moderately built and nourished and the vital signs were within normal parameters. Extra oral examination revealed a diffuse swelling on right side of lower border of the mandible. The swelling was bony hard in consistency and tender on palpation. Right submandibular lymph nodes were palpable. Intra-orally on inspection deep dental caries was present in relation to 85 and 75.Vestibular obliteration was present in relation to 85.On palpation, there

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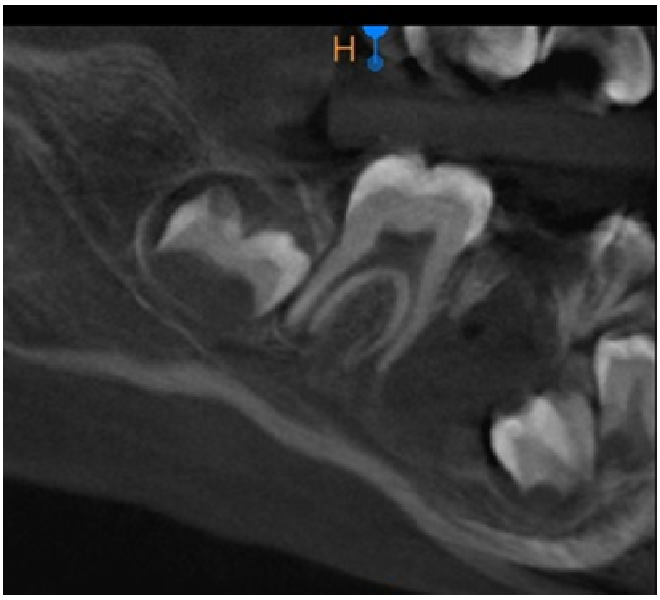
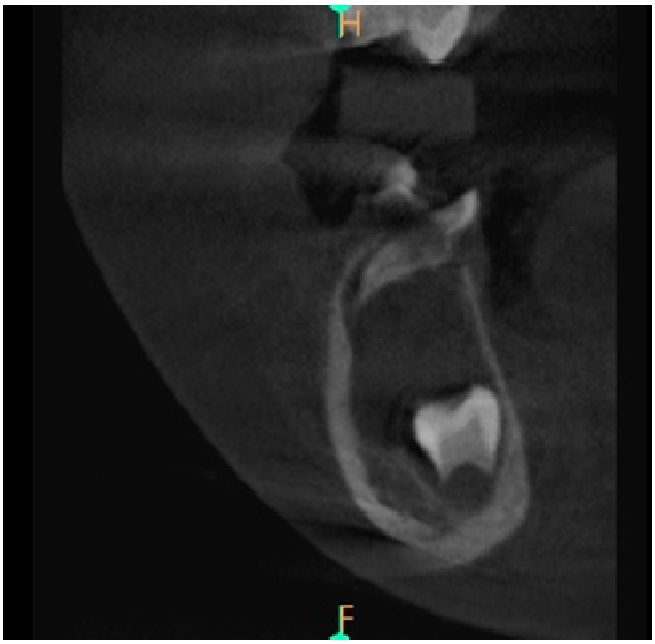
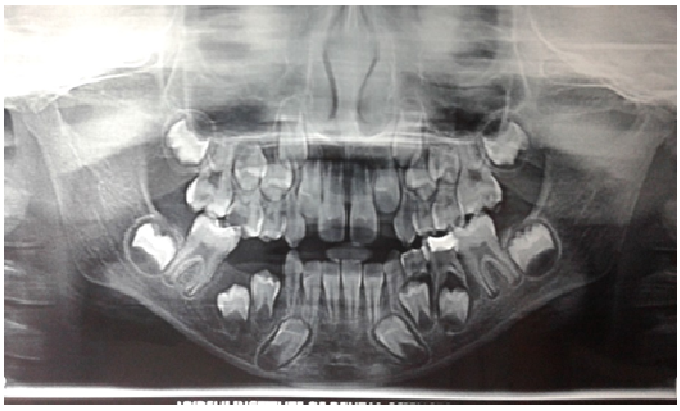
was a hard bony swelling in relation to 85 measuring about 1cm x 0.5cm which was tender. Tooth was tender on percussion and not mobile.





Legend 1. Preoperative Radiograph showing a well-defined radiolucency present in the periapical region and furcation region of 85



Legend 2. Post operative Radiograph

Investigations and Diagnosis

Digital Orthopantomogram revealed a well-defined radiolucency present in the periapical region and furcation region of 85. The succedaneous tooth i.e., 45 was displaced mesially. Based on the clinical examination and radiographic examination the provisional diagnosis was given as radicular cyst in relation to 85 and differential diagnosis was given as Dentigerous cyst in relation to erupting second premolar i.e., 45.

Management

Surgical enucleation of the cyst under local anesthesia was the treatment chosen for this case. Surgical enucleation and extraction of 84, 85 was done in the Department of Oral and Maxillofacial Surgery. The cystic lining was sent for histopathologic examination. The operated site was irrigated with saline and betadine and sutures were placed. The patient was advised regular follow up and review.

Final Diagnosis

Histopathology confirmed the diagnosis as Infected Periapical cyst.

DISCUSSION

A radicular cyst is generally defined as a cyst arising from epithelial residual (cell rests of Malassez) in the periodontal ligament as consequence of inflammation, usually following the death of dental pulp. Radicular cysts are the most common odontogeniccystic lesions of inflammatory origin affecting the jaws. They are most commonly found at the apices of the involved teeth. However they may also be found on the lateral aspect of the roots in relation to lateral accessory root canals. Most of the radicular cyst are symptomless and are discovered when periapical radiograph are taken of teeth with non-vital pulps. Patient often complains of slowly enlarging swellings. Radiographically most radicular cyst appears as round or pear shaped unilocular radiolucent lesion in the periapical region. The cyst may displace adjacent teeth or cause mild root resorption. The present case also had similar findings. Radicular cysts are the most common of all jaw cysts and comprise about 52% to 68% of all the cysts affecting the human jaws. Actual prevalence of cysts is only about 15% of all apical periodontitis lesions. Their prevalence is highest among patients in their third decade of life, and higher among men than women. (Nainani and Sidhu, 2014) Radicular cysts associated with deciduous teeth are reported to occur in age range of 3–19 years with a male preponderance. The most commonly involved deciduous teeth are mandibular molars (67%), maxillary molars (17%) followed by anterior teeth. (Namdev *et al*., 2015) Preceded by a chronic periapical granuloma and stimulation of cell rests of Malassez found in the periodontal membrane. Rests of Malassez are remnants of Hertwigs' roots heath. Although the source of the epithelium is usually a rest of Malassez, other sources, such as crevicular epithelium, sinus lining, or epithelium lining of fistulous tracts, have been suggested. These cysts usually arise from the epithelial residues in the periodontal ligament as a result of inflammation. They generally result due to pulpal infection following dental caries. Bacteria from the gingival sulci or periodontal pockets havebeen suggested to reach the root canals ofthese teeth through severed periodontal blood vessels.

Radicular cysts are inflammatorylesions leading to bone resorption and canreach great dimensions and becomesymptomatic when infected or with great size due to nerve compression. Pulpal infection can also occur through exposeddentinal tubules at the cervical root surface,due to gaps in the cemental coating. Microbes have also been claimed to 'seed' inthe necrotic pulp via the blood circulation (anachoresis). Initially, the tooth pulpbecomes infected and necrotic by anautogenous oral microflora. The endodontic environment provides a selective habitat forthe establishment of a mixed, predominantlyanaerobic flora. Collectively, this habitat adapted polymicrobial community residing in the root canal has several biological andpathogenic properties, such as antigenicity, mitogenic activity, chemotaxis, enzymatichistolysis, and activation of host cells. The microbial invaders in the root canal can advance, or their products can egress, into the periapex. In response, the host mounts anarray of defenses consisting of severalclasses of cells, intercellular messengers, antibodies, and effector molecules.

The microbial factors and host defense forces encounter, clash with, and destroy much of the periapical tissue, resulting in the formation of various categories of apical periodontitis. Periapical cysts are direct sequel to chronic apical periodontitis, but not every chronic lesion develops into a cyst. There are two distinct categories of periapical cysts, namely, those containing cavities completely enclosed in epithelial lining, and those containing epithelium-lined cavities that are open to the root canals. The latter was originally described as 'bay cysts' and has been newly designated as 'periapical pocket cysts'. More than half of the cystic lesions are true apical cysts, and the remainder are apical pocket cysts. These cysts can occur in the periapical area of any teeth, 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. In the maxilla, the anterior region appears to be more prone to cyst development whereas in the mandible the radicular cysts occur more frequently in the premolar region. Most of the radicular cysts are symptomless and are discovered when periapical radiographs are taken of teeth with non-vital pulp. Patient often complains of slowly enlarging swellings. At first the enlargement is bony hard but as the cyst increases in size, the covering bone becomes very thin despite sub-periosteal bone deposition and the swelling then exhibits 'springiness'. Only when the cyst has completely eroded the bone, there will be fluctuation. In the maxilla there may be buccal or palatal enlargement whereas in the mandible it is usually labial or buccal and only rarely lingual. Pain and infection are other clinical features of some radicular cysts. (Nainani and Sidhu, 2014) The treatment options for radicular cyst canbe conventional nonsurgical root canal therapy when lesion is localized or surgical treatment like enucleation, marsupialization or decompression when lesion is large. The choice of treatment may be determined by the factors such as the extension of the lesion, relation with noble structures, origin, and the clinical characteristics of the lesion, and cooperation and systemic condition of the patient. (Nainani and Sidhu, 2014)

Conclusion

The reported case is one of the rare case of Raicular cyst/ Periapical cyst of mandible. Such cystic lesions can be prevented by early diagnosis and treatment of carious lesions in early stages.

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