CASE REPORT

Surgical Enucleation of Large Radicular cyst - Case Report

Narotam Ghezta

Abstract

The maxillofacial region is affected by a greater number of cysts than any other part of the body. Radicular cysts are the most common odontogenic cystic lesions of inflammatory origin and are managed either by surgical enucleation or by marsupialization. Here a case report is presented of a large radicular cyst that involved over half of palatal region of maxilla. Presentation, diagnosis and management of the radicular cyst is discussed.

Key words: Odontogenic cyst, Jaw lesion, Radicular cyst, Periapical pathology.

Introduction

Odontogenic cysts are the most common form of cystic lesion that affects the maxillofacial region. They are classified traditionally into a developmental group, including keratocyst and dentigerous cyst, and an inflammatory group including radicular cyst. Developmental cyst are usually asymptomatic, but have the potential to become extremely large and cause cortical expansion and erosion. Radicular cyst are the most common cystic lesions affecting the jaw. It is most common of all the jaw cysts and comprises about 52% to 68% of all the cyst affecting the human jaw. Actual prevalence of cyst is only about 15% of all apical periodontitis lesions. Their prevalence is highest among patients in their third decade of life, among men than women. Radicular cysts are rare in the primary dentition, representing only 0.5% to 3.3% of the total number of radicular cysts in the primary dentitions. A radicular cyst arises from epithelial remanants stimulated to proliferate by an inflammatory process originating from pulpal necrosis of a non-vital tooth. The natural history begins with a non-vital tooth which remains in situ long enough to develop chronic periapical pathosis. Unfortunately, very less is known about the natural history of radicular cysts, that is, what proportion of radicular cysts regress and what proportion grows, and why. A case reported is presented of an individual with a large radicular cyst that happens to involve palatal side of maxillofacial region.

Case report

A 34-year old female patient reported to the department of Oral and Maxillofacial Surgery with the chief complaint of pain and swelling for the last six months. Intraoral clinical examination revealed a round to oval swelling located over left palatal region in association with left maxillary incisor to second premolar region. On palpation the lesion was approximately 3.5 x 5 cm, soft to firm in consistency and tender. The mucosa overlying the swelling exhibited a bluish tinge (Fig 3). The occlusal and intraoral periapical radiograph showed large periapical radiolucency about 4cm in the horizontal plane and 3 cm in the vertical plane associated with teeth 21 and 25 (Fig 1,2). Aspiration was performed with a sterile needle of 0.5 mm and 1 ml of dirty white turbid fluid was obtained. On the basis of history and clinical finding, a provisional diagnosis was considered and the cyst enucleation was planned under local anesthesia. Medical history and investigations did not reveal anything that could oppose or influence
the proposed treatment plan. Assessment of the surgical site showed adequate mouth opening. Local anesthesia of 2% lignocaine with 1:200000 adrenaline was infiltrated in the greater palatine foramina and nasopalatine nerve were also anesthetized by infiltration in the incisive foramina. The palatal full thickness mucoperiosteal flap was elevated to expose the area of periapical lesion (Fig 4). Upon entry into the cystic cavity there was turbid white dirty fluid associated with cystic lesion. Lavage with sterile saline was performed. Already existing pathological cortical bone window was expanded until underlying pathology was adequately exposed and sufficient space was available for thorough curettage. However, cautioned was exercised in separating the lesion from the nasopalatine palatine nerve and artery. The lesion was curetted in totto. (fig5,7) The enucleated periapical lesion was stored in 10% neutral formalin solution and sent for histopathological examination. In the root canal treated teeth gutta-purca at the exposed root apex was burnished. The bone cavity was irrigated with sterile saline solution and gently dried with moist gauge. Careful clinical examination of the area was done to ensure no residual lesion tissue was left behind. The flap was repositioned and the flap margins were ensured to rest on sound bone. (fig6). The flap was sutured using 4-0 silk with interrupted sutures. The patient was given post operative instruction. Antibiotics, analgesic and mouthwash were prescribed. On the 7th post operative day, healing of covering mucosa was observed and the sutures were removed. Histopathological report diagnosed the lesion as radicular cyst.
Discussion

A wide variety of cysts and neoplasms may occur in the maxillofacial region, and there identification can be difficult. The most important of these are maxillary cysts. A cyst is a pathological cavity with a defined wall of connective tissue and an epithelial carpet filled with liquid, semiliquid or gaseous contents. Growth of a cyst is typically slow, centrifugal and infiltrative. Radicular cyst are thought to arise from epithelial cells rest of Malassez in the periodontal ligament, and they are believed to proliferate as a result of periapical inflammation caused by infection of the root canal system. Bacteria from the gingival sulci or periodontal pockets have been suggested to reach the root canals of these teeth through severed periodontal blood vessels. Pulpal infection can also occur through exposed dentinal tubules at the cervical root surface, due to the gaps in the cemental coating. Microbes have also been claimed to seed in the necrotic pulp via the blood circulation. Initially, the tooth pulp becomes infected and necrotic by an autogenous oral microflora. The endodontic environment provides a selective habitat for the establishment of a mixed, predominantly, anaerobic, flora. The microbial invaders in the root canal can advance, or their products can egress, into the periapex. There are two main theories regarding the formation of the cyst cavity. The nutritional deficiency theory is based on the assumption that the central cells of the epithelial strands become removed from their source of nutrition and undergoes necrosis and liquefactive degeneration, the accumulating products in turn attracts neutrophilic granulocytes into the necrotic area. Such microcavities containing degenerating epithelial cells, infiltrating mobile cells and the tissue fluid coalesce to form the cyst cavity lined by stratified epithelium. The abscess theory postulates that proliferating epithelium lines an abscess cavity formed by tissue necrosis and lysis because of the innate nature of the epithelial cells to exposed connective tissue surfaces. During the third phase the cyst grows, but whose exact mechanism is still unknown. It is generally believed to be by osmosis. The presence of necrotic tissue in the cyst lumen attracts neutrophilic granulocytes, which extravasate and transmigrate through the epithelial lining into the cyst cavity where they perish. The lytic products of the dying cells in the cyst lumen release a greater number of molecules. As a result, the osmotic pressure of the cyst fluid rises to a higher level than that of the tissue fluid. The latter diffuses into the cyst cavity so as to raise the intraluminal hydrostatic pressure well above the capillary pressure. The increased intracyst pressure may lead to bone resorption and expansion of the cyst. However, the fact that an apical pocket cyst with lumen open to the necrotic root canal can become larger suggests against osmotic pressure as a potential factor in the development of radicular cyst. Further, there is increasing evidence in support of molecular mechanism for cyst expansion. The T-lymphocytes and macrophages in the cyst wall may provide a continuous source of bone resorptive metabolites and cytokines. The presence of effective effector molecules such as matrix metalloproteinase-1 and -2 have also been reported in the cyst walls. Radicular cyst can occur in the periapical area of any teeth, at any stage but are seldom seen associated with the primary dentition. Anatomically, the apical cysts occur in all tooth bearing sites of the jaw but are more frequent in maxillary than mandibular teeth. In the maxilla, the anterior region appear to be more prone to cyst development whereas in the mandible the radicular cysts occur more frequently in the premolar region. The management of large cystic lesion has been subject of prolonged debate. The treatment options for large periapical lesions range from conventional non surgical root canal
treatment with long-term calcium hydroxide therapy to various surgical interventions. For several reasons, surgical treatment may be the preferred approach to treating a large periapical cyst. For example, if the apical radiolucency is very large (diameter >20 mm), surgical removal may be the best option. Longstanding infection and necrosis of the pulp causing a large apical radiolucency may be deemed refractory to conventional treatment because of the high probability that the lesion is a cyst. Surgical treatment may also be recommended when the canal appears calcified or obstructed and cannot be negotiated with instruments. This is often assumed to be the case when the canal cannot visualized radiographically, particularly if root-end surgery has already been performed. Failure of treatment with a metal obturating material is another reason for surgery. The surgical approach to cystic lesion of the jaws is either marsupialization or enucleation. The treatment of choice is dependent on the size and localization of the lesion, the bone integrity of the cystic wall and its proximity to vital structures. Cysts are usually enucleated, where the cystic lining is separated from its inner bony surface and removed and the cavity allowed filling with blood clot. In this case on proceeding with the investigation, the radiograph revealed a well circumscribed radiolucency in the periapical region of the central incisor to second premolar. Considering the size of the lesion and age of the patient we decided to directly excise the lesion.

References

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