

Clinical and Radiological Features of an Unusual Radicular Cyst Involving Maxillary Sinus

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Abstract

Objectives: Epithelium at the apex of a nonvital tooth can be presumably stimulated by inflammation to form a true epithelium-lined cyst, or radicular cyst. Radicular cyst is the most frequent cyst found in the jaw (between 38% to 68% all jaw cysts). Most of the radicular cysts are found in the maxilla, especially around incisors and canines. Some of the periapical lesions can extend to the surrounding tissues and it is not uncommon to find them way around the apex of involved teeth.

Case Report: A 47-year old man with no past medical history was referred to the department of oral and maxillofacial radiology of Tehran University of Medical Sciences, with a complaint of a painless swelling on the buccal cortex of the left maxilla. The swelling was smooth-surfaced. Patient's panoramic radiography revealed well-defined unicystic radiolucency extended from alveolar crest to the floor of the orbit. The area was examined with conventional computed tomography to evaluate bone involvement. On axial view of CT images of the patient, an expansile lesion with 34*28 mm dimension was seen and the buccal cortex, medial and lateral walls of maxillary sinus and the lateral wall of nasal cavity were also eroded and in some parts were perforated. Under general anesthesia and with releasing incision, access to the left maxillary sinus with the Caldwell luc method was available. After complete excision the lesion, curettage of the remaining walls and peripheral osteotomy was performed.

Conclusion: This presentation describes an unusual case of large radicular cyst involving maxillary sinus and its treatment. Radiological examinations provided valuable information.

Keywords: Computed Tomography; Maxillary Sinus; Radicular Cyst

Introduction

Radicular cyst is the most frequent cyst found in the jaw (between 38% to 68% all jaw cysts). The prevalence of periapical cysts varies between 8.7% and 37.7% of chronic inflammatory periapical lesion [1]. This cyst represents a chronic inflammatory process and develops only over a prolonged period of time. Some of the periapical lesions can extend to the surrounding tissues and it is not uncommon to find them way around the apex of involved teeth. In the literature, most cases of unusually large periapical lesions of odontogenic origin are found in the maxilla where the bone is spongy [1]. Because of the bone consistency it is easier for the lesion to occupy bony space and expand. Lesions have been found to involve the entire sinus and even the floor of the nasal cavity [2]. This case report presents an extraordinary large case of radicular cyst in the maxillary sinus with an unusual radiographic feature.

Case Report

A 47-year-old man with no past medical history was referred to the department of oral and maxillofacial radiology of Tehran University of Medical Sciences by a general dental practitioner for diagnosis of an unusual radiographic lesion in left maxillary sinus in routine dental examination. Clinically, there was a well-defined slight swelling with a smooth surface and small fistula on the buccal cortex of the left maxilla. The swelling was a little compressible on palpation, which indicates a loss of integrity of buccal bone (Figure 1).



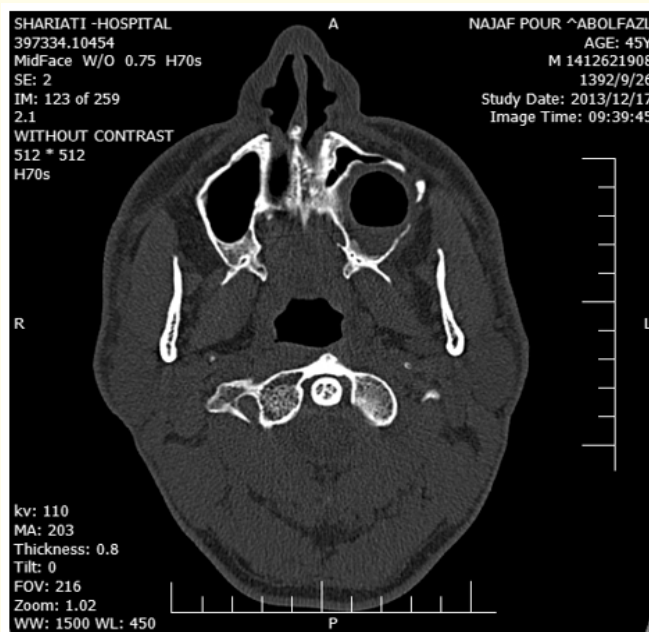
Figure 1: Intraoral view.

On intraoral examination, the first maxillary molar tooth was missing (extracted) and patient declared that he had pus discharge over a period of time in last 4 months. Patient's panoramic radiography revealed well-defined unicystic radiolucency extended from alveolar crest to the floor of the orbit. The lesion was occupied nearly the whole left maxillary sinus the roots of second and third molar teeth were resorbed completely by the lesion (Figure 2).

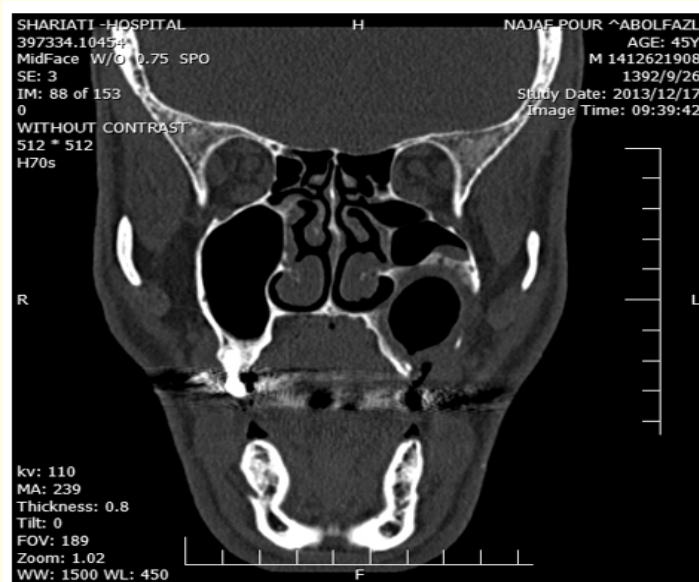


Figure 2: Panoramic view.

On axial view of CT images of the patient, an expansile lesion with 34*28 mm dimension was seen and the buccal cortex, medial and lateral walls of maxillary sinus and the lateral wall of nasal cavity were also eroded and in some parts were perforated. But other sinuses were intact. Also, significant mucosal thickening in the sinus had happened (Figure 3).



a



b

Figure 3: Preoperative CT images of the patient (a. Axial view, b. Coronal view).

Following history, clinical and radiographic examinations, a differential diagnosis of radicular cyst was made. It was then decided to perform an incisional biopsy under local anesthesia from the posterior site of the lesion from where the bone was perforated. Histopathology reports indicated a cystic cavity with nonkeratinized-stratified squamous epithelium showing hyperplasia, cellular edema in some parts of the cyst's wall. Patient management (surgical plan): Under general anesthesia and with releasing incision, access to the left maxillary sinus with the Caldwell luc method was available. After complete excision the lesion, curettage of the remaining walls and peripheral osteotomy was performed. Just after antrostomy, a mesh unit soaked with tetracycline was placed in the left maxillary sinus and brought out from the nasal cavity. Finally, after all these attempt, the excision was sutured.

Patient follows up

Panoramic and cone beam computed tomography were prepared from patient to investigate the healing process and also the possibility of recurrence of the lesion (Figure 4 and 5).



Figure 4: Panoramic view.

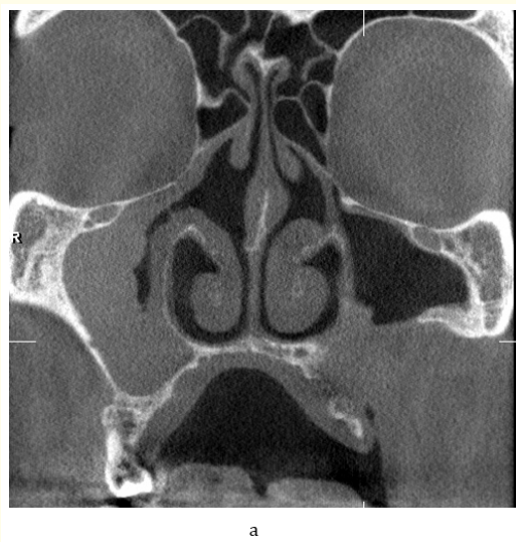




Figure 5: Postoperative CBCT images of the patient (a. Coronal view, b. axial view).

Discussion

Larger odontogenic cysts within the jaws are uncommon, and when they do occur, they tend to be odontogenic keratocysts or dentigerous cysts. Residual dental cysts harbor an innocuous pathosis and are often discovered as incidental findings on routine radiographs unless infected, it is rare to find symptomatic residual dental cysts which will result in clinical signs or symptoms that will concern the patient to seek treatment. The pathogenesis of radicular cysts has been described as comprising of three distinct phases: the phase of initiation, the phase of cyst formation, and the phase of enlargement [3]. 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 sub-periosteal bone depression. Finally, with progressive bone resorption swellings exhibit “springiness” or “egg shell crackling” [4]. The associated teeth are always non-vital and may show discoloration. As in our case the second and third molar teeth were non vital. Although the associated teeth usually show no root resorption, there may be smooth resorption of root apices. This was controversial to the features of our case, which shows extensive root resorption approximately to the whole roots. When cysts are intact, cyst cavities may be filled with brown or straw-colored fluid, while the cyst fluid may have a shimmering gold appearance when light passes through it [4].

The nature of epithelium lining depends on the stage of development of the cyst and also the severity of inflammation. Radiographically, the residual cyst is a unilocular radiolucent lesion with well circumscribed sclerotic borders that are often opaque. The lesion is associated with the apex of the tooth and diameter of atleast 1 cm is postulated to be necessary to differentiate it from the of a normal follicular space [5]. Other odontogenic cysts like dentigerous cysts-odontogenic keratocysts ,and odontogenic tumors such as ameloblastoma, pindborg tumor odontogenic fibroma and cementomas may share the same radiologic features as radicular cysts. As in our case the radiographic appearance the lesion was not typical for a radicular cyst and it could be misdiagnosed with and odontogenic keratocyst tumor or with a unicystic ameloblastoma. Because of that, the whole pathologic mass was observed completely to rule out any serious pathological lesions. Microscopic evaluation is necessary most of the time to define the type of lesions [6].

Our specimen was diagnosed histologically as radicular cyst with a layer of non-keratinized stratified squamous epithelium in fact all radicular cysts are lined partially or completely by non-keratinized stratified squamous epithelium. Keratinization is seen in approximately 2% of cases, and when it is present, ortho-keratinization is more common than para-keratinization [7]. When cysts are especially large,

with maxillary sinus involvement as in our patient, the panoramic radiograph is often not of great aid. Cross section alimaging provide superior bony detail allowing for the visulization of the size and extension of the lesion with determination of orbital or nasal invasion or involvement. Again, with larger lesions, it also aids in planning of a surgical approaches. mucocelles, retention cysts, and pseudocysts are also included in the differential diagnosis when a maxillary sinus cyst is visualized involving sinus; this is in addition to the array of radiolucent lesions mentioned above that can also be visualized in CT [8]. A large maxillary cyst may involve the whole sinus and can transmit to the walls of sinus; consequently, ophthalmologic and nasal symptoms may develop. As in our patient who declare nose congestion.

Conclusion

With extensive lesions, it is important to carefully plan the surgical approaches. The choice of treatment may be determined by some factors such as extension of the lesion, relation with noble structures, evolution, origin, clinical characteristic of the lesion, cooperation and systematic condition of the patient [9]. Some authors suggested a nasal approach; however, in keeping with the law of gravity it is reasonable to surmise that the content from maxillary cysts can be drained much more easily into the oral cavity. An oral vestibular approach is therefore than a nasal approach [10,11].

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