Case report

DIAGNOSTIC POSSIBILITIES OF 3D-COMPUTED TOMOGRAPHY WITH INTRALESIONAL APPLICATION OF CONTRAST MATERIAL IN A CASE OF VERY LARGE RADICULAR MAXILLARY CYST - A CASE REPORT

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ABSTRACT:

Introduction: Diagnosis of odontogenic cysts despite their benign nature is a critical and challenging problem.

Aim: The aim of this article is to demonstrate a different diagnostic approach in case of a very large odontogenic cyst.

Materials and Methods: This study reports a case of a male patient aged of 38 using 3D computed tomography and contrast material inside the lesion. Differential diagnosis made by the residents was compared to the histopathological examination as the gold standard for identifying the nature of the cysts.

Results: This diagnostic approach using 3D computed tomography combined with contrast material injected inside the lesion shows the real borders of the cyst of the maxilla and helps the oral surgeon in planning the volume of the surgical intervention.

Conclusion: Precise diagnosis ensures the possibility of doing the optimal surgical intervention - a precondition for best wound healing.

Keywords: 3D computed tomography, radicular cyst, contrast material

INTRODUCTION:

Radicular cysts are the most common cystic lesions of the jaws. Radicular cysts comprise about 52% to 68% of all the cysts which affect the human jaw. [1, 2] Radicular cysts commonly occur in the anterior region of upper jaw between 30th and 50th year of age frequently in men.[3] They are most commonly found at the apices of the involved teeth which are non-vital. [4] These lesions also may be observed at the lateral aspect of the roots in relation to lateral accessory root canals. [5] Generally, radicular cysts are asymptomatic and frequently are diagnosed during radiographs performed for other reason.[4] Orthopantomography (OPG) is the most useful radiographic method for planning the surgical intervention in

oral surgery. In cases of large cysts of jaws, CT can be used. The treatment for radicular cysts could be performed in one step (enucleation, marsupialization) or in two steps (decompression and after decreasing the size - enucleation) when lesion is large [6]

CASE REPORT:

A 38- year-old male patient was referred to the Oral surgery department with complaints of painful swelling to the upper lip on the left side, the last of serial similar swellings. In previous exacerbations, the patient was treated with antibiotics. The extraoral examination found facial asymmetry with changed elasticity and skin colour in the region. Intraoral clinical examination revealed oval swelling located over labial mucosa of the anterior region of upper jaw. It was soft, inflamed and fluctuant, painful on palpation. Because of signs of acute inflammation, we performed an intraoral incision and evacuated 8-10 ml pus. We put a rubber drain and prescribed antibiotic (Augmentin 0,625 every 8h) and analgesic (Dialgin 1,0 every 12 h) for 5 days. During the control appointment, the acute inflammation was reduced. We removed the drainage. To make a correct diagnosis we needed radiographic image – OPG, that the patient performed 20 days later. The OPG revealed the presence of a large, osteolytic lesion in the upper jaw involving the central and lateral incisors, as well as the canines, both sides, with irregular borders. (fig 1). To determine the real size and borders of the lesion we decided to perform 3D computed tomography (Sirona Galileus, Siemens) with contrast material injected into the formation. As contrast material, we used Omnipaque (GE Healthcare AS, Norway), 12 ml, after probing for hypersensitivity. Prior to contrast application the same quantity cystic liquid was evacuated by aspiration. (fig 2) The diagnosis that we established after this study was a radicular cyst of the maxilla. The patient was referred for endodontic treatment of the teeth in the cystic formation. The surgical treatment included creation and elevation of the mucoperiosteal flap, enucleation of the cyst, application of iodoform powder, filling the cystic cavity with a

gauze drain, repositioning of the flap and suturing under local anaesthesia. Gauze drainage was removed into two consecutive visits in the third and fifth days; sutures were removed 10 days postoperatively. The surgical wound healed by primary intention. No complications were noted during the postoperative observation period of 6 months. Five years after surgical intervention was performed, an OPG was taken – bone in the region was completely regenerated (fig. 3).

Fig. 1. Preoperative roentgenography.

Fig. 3. 5 years postoperative.

Fig. 2. 3D computed tomography with local injected contrast material.

DISCUSSION:

Radicular cysts are one of the most common odontogenic cysts of the jaws. [7] These lesions arise from the proliferation of epithelial rests of Malassez stimulated by inflammation due to root canal infection and pulp necrosis. [8] In some cases radicular cysts can originate after trauma. [4] Other authors consider that the occurrence rate of these cysts is approximately 20 % of all the pathologic lesions of jaws and 90% of all oral and maxillofacial cysts. [9] They affect the maxilla three times more often than the mandible. [10]

Despite their benign nature and slow growing behaviour radicular cysts could expand in the jaws and reach a considerable size that invades the adjacent anatomical structures [9]. There is a chance that malignancy tumours like Squamous Cell Carcinoma may originate from the epithelium of these benign lesions. [11]

Radicular cysts are usually asymptomatic and appear incidentally on routine radiographies. Cortical expansion and root resorption of the affected teeth and displacement of the adjacent teeth are common features of these cysts [4, 12]. Teeth in the radicular cyst are non-vital. With the enlargement of the cyst, there is risk for adjacent teeth to become non-vital too. Endodontic treatment of the involved teeth prior the surgical intervention is mandatory.

In most cases of radicular cysts, an OPG is performed to confirm the diagnosis. Radiographically these lesions appear well-circumscribed, unilocular, round-to-oval, radiolucent periapical lesions in teeth with pulpal necrosis [13]. They are associated with destruction of the lamina dura of the affected teeth [13]. The occurrence of radicular cysts as

a mixed radiographic image is extremely rare [14]. In case of very large cystic lesions of the jaws conventional X-ray studies are not representative [15], and in these cases, it is better to perform computed tomography. In this case, 3D computed tomography with contrast material injected into the lesion helped us to establish correct diagnose and to choose the appropriate treatment plan, which is very important for successful treatment of the patient. There is not many if any reports on this technique. Makandar AM et al. [16] reported a case that contrast radiography was performed to differentiate between unilocular and multilocular lesions of the jaws. For this procedure they used Urografin 76% as a contrast agent.

Differential diagnosis should be made between radicular cysts and other odontogenic and nonodontogenic lesions of the jaws. There are two treatment methods of radicular cysts. The first is conventional nonsurgical root canal therapy when the cyst is localised. [6] The second surgical treatment is enucleation, marsupialization or decompression when the formation is large [6] The diagnosis should be confirmed histopathologically.

CONCLUSION:

Radicular cysts are the most common lesions of jaws. Differential diagnosis with other lesions is an important assignment. The diagnosis should be established after using the most appropriate diagnostic approach which helps the surgeon to choose the optimal treatment plan – a precondition for perfect treatment results. The diagnostic technique described in this article, is cost effective and can narrow down the range of differential diagnosis.

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