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Case Report

Stafne bone cyst: A case report with review of literature

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1. Introduction

Cystic lesions are one of the most common pathology of jaw bones. Cysts which have no definite epithelial lining are termed as pseudocysts. The inherited capacity of the cyst to enlarge makes the complete removal of the cyst along with its lining necessary. However, there are some cystic lesions which are said to be asymptomatic and requires no treatment as such unless they cause any problem to the patient.

Edward C Stafne was the first to describe Stafne Bone Cyst (SBC) in 1942. He described them as bony cavities in the posterior mandible of 35 patients.[1] These cavities are asymptomatic and are found only during routine radiography below the inferior alveolar canal, located distal to 3rd mandibular molar and inferiorly limited by the mandibular border. They are radiolucent and unilateral, and rarely bilateral. The absence of a cystic epithelial lining makes it a pseudo cyst. It has various other names like, latent/static/idiopathic bone cyst, cavity or defect, developmental submandibular gland defect, lingual mandibular bone defect or latent bone cyst.[2]

Studies have found the incidence of Stafne's bone defect to range from 0.10% to 0.48% with a male-to-female ratio of 4 to 1. Most of these painless lesions occur in the fifth and sixth decade of life.[3] Although the radiological features of SBC have been widely reported, the use of cone beam CT (CBCT) for its diagnosis has rarely been reported. The aim of this article is to explore into the clinical and radiographic features of SBC using OPG & CBCT and to investigate CBCT as a tool for exploring SBCs.

2. Case report

A 60 year old, male patient reported to the Department of Oral & Medicine & Radiology, JSS Dental College & Hospital, Jgadguru Sri Shivarathreeshwara University, Mysuru, India, with a chief complaint of missing multiple upper and lower teeth. The patient's medical history did not reveal any significant systemic abnormality. Extra oral examination showed no facial asymmetry. Intraoral examination revealed missing upper and lower posterior teeth, lower anterior teeth, generalized attrition as well as a chronic generalized periodontitis (Fig. 1). Patient was advised to undergo routine panoramic radiography in order to assess the edentulous ridges as well as the periodontal condition of the patient.

OPG revealed a unilocular radiolucency, roughly ovoid in shape, in the left posterior region of the mandible below the mandibular 3rd molar. It was located inferior to the mandibular canal, with well – defined margins measuring approximately 2.5×1.2 cm in dimension (Fig. 2). Palpation of the defect was not painful and the cavity could not be palpated by bi-digital palpation. CBCT was found appropriate for further evaluation.

Results showed an oval-shaped, radiolucent area of cystic aspect and regular, well-defined cortical outline with lingual cortical resorpton. Its longest axis was placed horizontally in the left hemimandible. This area, located under the lower left third molar, was anterior to the mandibular angle. The lower wall of the mandibular canal which was visible within the radiolucent area showed that there could be a neighboring relationship, but not an involvement, of the inferior alveolar nerve. Patient displayed no pain or paresthesia. Lesion with size approximately measuring

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Fig. 1. Intra-oral view.

Fig. 2. OPG showing radiolucency in left posterior mandibular body-angle region.

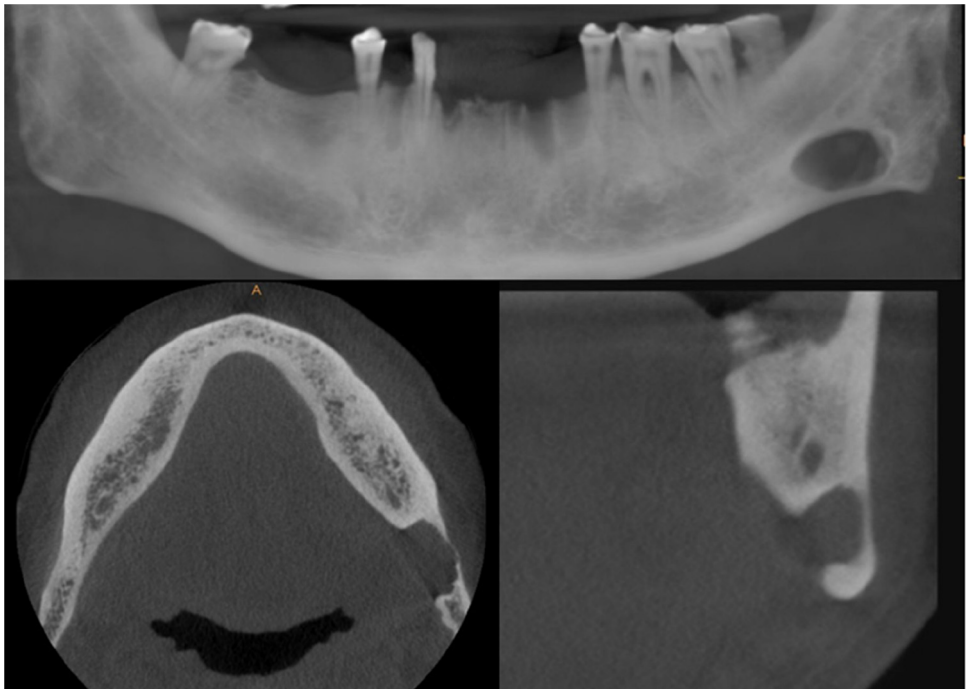

Fig. 3. a. OPT-like reconstruction from CBCT data showing the well define radiolucency in the mandibular left posterior region, b. Axial view showing the defect with lingual cortical bone destruction & diminished buccal cortical bone, c. Coronal view showing the characteristic location of the defect inferior to the mandibular canal.

$2.2 \times 1.2 \times 1.5$ mm (mesio-distal length, inferosuperior height, bucco-lingual depth) was seen involving the lingual wall of the basal bone (Fig. 3). A diagnosis of Stafne bone cyst was made and it was decided that the patient would undergo a 3-month follow-up period.

3. Discussion

Though SBC is considered a pseudocyst, it does produce a cystic appearance on radiographs, and as it is occasionally confused with the solitary bone cyst. Of importance in the differential diagnosis is that the solitary bone cyst almost invariably lies above the inferior alveolar canal while SBC lies below the canal[1]. The bone cavity is anatomically related to the submandibular gland fossae and it may contain a portion of salivary gland, adipose tissue, connective tissue, lymphoid tissue, striated muscle or blood vessels. In some cases, the cavity is just empty.

The Stafne bone defect was first described by Stafne in 1942. The exact pathogenesis is still obscure. According to Stafne, failure of normal bone deposition in the region formerly occupied by cartilage can result in this cyst formation. However, the most widely accepted view is that the cavities develop as a result of a localized pressure atrophy of the lingual surface of the mandible from the adjacent salivary gland. In our case, we were unable to recover any bony expansion along with cortical thinning or breach in the continuity of cortex.

Lello and Makek (1985), who reported an extensive review of the literature, suggested that the bone defect was the result of an ischaemic process in an area adjacent to the passage of the facial artery.[1,4] Tensile muscle forces together with haemodynamic forces, they proposed, pulled the artery from the lingual cortex, thus compromising its nutrition. This theory does not, however, take account of the relative rarity of lingual bone defects.[1]

The posterior lingual variant has an incidence of between 0.10% and 0.48% when diagnosed radiologically. This rather large difference in prevalence between studies has been attributed to the difficulty in identifying these entities radiographically. A frequency rate of SBC of 0.08% was determined in various studies.

SBC is most commonly reported in the age group of 50–60 years. Oikarinen and Julku (1974) found in their study that, all patients were males and with the exception of one 19 year old, all were over the age of 40. In a similar survey, Correll and co-investigators (1980) discovered 13 cases in 2693 panoramic radiographs (0.48%) where 96% of patients were men.[1] In our case, SBC was diagnosed in a male patient in his 6th decade of life.

Stafne bone defect has anterior and posterior variants. The posterior variant is the most known variant and is located between the mandibular angle and first mandibular molar tooth below the inferior dental canal.[5] The defect in our case was located in the third molar region, anterior to mandibular angle and below the inferior alveolar canal.

The diagnosis of this defect is incidental, since patients do not usually present clinical symptoms. In the orthopantomograph, the technique which usually first identifies this entity, a radiolucent image with a well-defined sclerotic border is generally observed, situated at a posterior location of the mandible, below the inferior dental canal. In doubtful posterior cases (including odontogenic cysts and tumour-like lesions) or when the rare anterior type is suspected, additional examinations have to be completed to confirm diagnosis. CT, CBCT, MRI and sialography techniques have been used to achieve a final diagnosis of SBC.[6]

CBCT & CT has been reported as a complementary diagnostic procedure for SBCs since other jaw pathologies could be distinguished with this method. MRI is suggested for definitive diagnosis of SBC and reported to have less radiation exposure than CT. CT scan helps in assessing the content of cavities in terms of Hounsfield Unit (HU). For CT images, larger cavities of SBC may be perceived smaller than they were. Disadvantages of MRI include cost, discomfort to patient and possible image distortion. Sialography is also a diagnostic technique to determine whether glandular tissue exists in the cavity. However this procedure is invasive and uncomfortable for patient. CBCT procedure is reported as a non invasive easy method allowing definitive diagnosis and it can be useful in follow-up period. Since CBCT provides examination the suspicious radiolucent lesions in all sections with lower radiation exposure and higher speed, it might be used for diagnosis of SBC cases instead of CT imaging. Thus, radiographic follow-up is recommended management for SBC instead of surgery.[7] In this paper, OPG and CBCT are used for diagnosing the defect.

SBC differential diagnosis include benign and malignant jaw lesions such as odontogenic cystic lesion, non-ossifying fibroma, fibrous displasia, vascular malformation, focal osteoporotic bone marrow defect, brown tumour of hyperparathyroidism, ameloblastoma, basal cell nevus syndrome, giant cell tumor, or a metastasis from a primary malignant tumour.

Generally, no surgical treatment is necessary for SBCs, which are anatomic rather than pathologic. Clinical and radiographical examinations are adequate to confirm the static nature of cavities. Kao and co-investigators presented a mandibular fracture related to Stafne bone defect. Surgical management and biopsy can be performed when the diagnosis is unclear or to reduce the risk of the fractures when the defect has a critical size or has an alteration in size during the follow-up periods.[8]

4. Conclusion

Although the diagnostic procedure of a Stafne bone cavity is easier with only plain radiographs, confirmatory testing is sometimes required. In these situations, a limited examination with CBCT imaging can be definitive, by exposing the patient to lesser ionizing radiation when compared to CT and without the use of contrast material, or the discomfort of sialography. CBCT allows for the better visualization of the bone defect from all dimensions and it serves as an important adjunct tool along with routine panoramic radiographs in the detection of Stafne bone cysts of the jaw.

Conflict of Interest

None.

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