Stafne bone defect in the ramus of the mandible: a case report

Case Report

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Abstract

Introdouction:
Parotid Stafne bone defect is a very rare and infrequent variant, which is located on the buccal or lingual surface of the mandibular ascending ramus. In this paper, a case of parotid Stafne defect, which was incidentally discovered during dental radiographic examination, is reported. This bone defect was observed as a lucent oval-shaped defect on the lingual aspect of the right mandibular ramus. Parotid Stafne bone defect is a rare entity that should not be misinterpreted by radiologists.

Key words:
•Cone-Beam Computed Tomography • Parotid Gland• Mandible

Case Report

A 55-year-old man was referred by his physician to the Oral and Maxillofacial Radiology Department of Mashhad Dental College for parotid Stafne defect. His past history revealed that he was referred to an oral and maxillofacial radiology center for dental implant planning 2 years ago. The radiologist had informed him about the presence of a lesion in his right mandibular ramus with a presumptive diagnosis of parotid Stafne defect.

On extraoral and intraoral examinations, no swelling or discoloration was observed in the mucosa and the patient did not complain of pain or any other symptoms. His medical and familial histories were unremarkable.

In order to rule out benign tumors and achieve definitive diagnosis, the patient underwent panoramic and Cone-Beam Computed Tomography (CBCT) examinations.

In the panoramic radiograph, a well-defined unilocular radiolucent area in the posterior and upper one-third of the mandibular ascending ramus under the condylar neck was observed. The lesion did not have any effect on the inferior alveolar canal. No expansion was noticed on the dimensions of the mandibular ascending ramus (Figure 1).In comparison with the appearance of the lesion 2 years ago, the shape and size of the lesion now did not show any perceptible change. CBCT assessment revealed a well-defined unilocular, oval-shaped radiolucent area on the lingual aspect of the ascending ramus with an approximate size of 8.64 × 3.20 mm. The depression had involved almost the full thickness of the ramus in some sections (Figures 2, 3).

According to the radiologic and clinical examinations, the diagnosis of parotid Stafne defect was confirmed. No additional treatments except scheduled follow-up appointments were performed.

Figure 1. A panoramic radiograph shows a well-defined unilocular radiolucent lesion in the posterior and upper one-third of the mandibular ramus under the condylar neck.

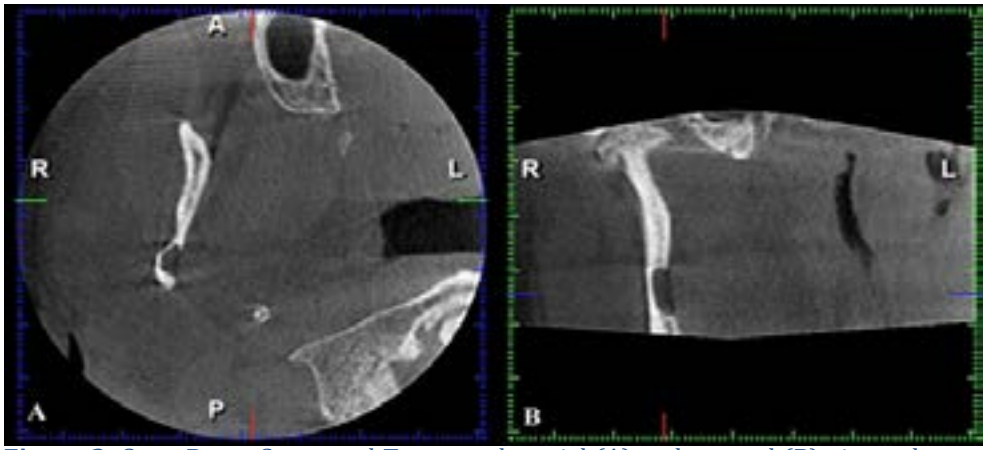

Figure 2. Cone-Beam Computed Tomography axial (A) and coronal (B) views show a well-defined bone defect on the lingual side of right mandible ramus.

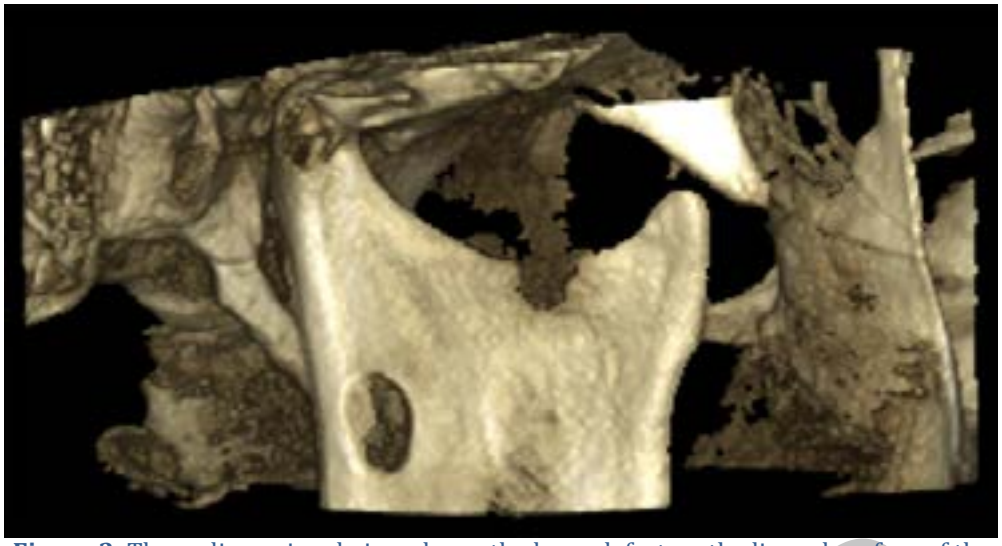

Figure 3. Three-dimensional view shows the bone defect on the lingual surface of the mandibular ramus.

In 1942, Edward C Stafne described Stafne bone defect (SBD) for the first time.[1] He reported 35 radiolucent, asymptomatic cavities, located unilaterally in the posterior region of mandible, below the inferior alveolar canal and slightly above the mandibular inferior cortex. Since then, this entity has been given numerous names, such as Static bone cyst, lingual mandibular bone defect, Stafne bone cavity, idiopathic bone cavity, lingual mandibular bone depression, aberrant or ectopic salivary gland defect, latent bone cyst, developmental bone defect, and embryonic mandible defect.[2, 3]

Salivary gland bone defects are rare and generally asymptomatic, which are found in routine radiographic examinations. If pain is present, other oral pathologies, such as chronic sialadenitis or pleomorphic adenoma, are considered.[2, 4] Other lesions that can be considered for differential diagnosis are ameloblastoma, keratocystic odontogenic tumor, solitary bone cyst, aneurysmal bone cyst, eosinophilic granuloma, central giant cell granuloma, and metastatic tumors.[5]

Although four variants of this defect have been described, when the term "Stafne bone cavity" is used in literature, it usually refers to the posterior lingual variant (LP) that is located between the angle of mandible and the first permanent molar, below the inferior alveolar canal.[3] The anterior lingual variant (LA), seven times less frequent than the posterior, is usually located between the incisor and the mandibular premolar areas, superior to the insertion of mylohyoid muscle. Variants located on the lingual or buccal surface of mandibular ascending ramus (LR and BR, respectively) are very rare. The rarest type of defect was located on the buccal aspect of the mandibular ascending ramus, which was described by Shields during a study of 7,686 dry mandibles.[6, 7]

Although posterior variants of SBDs with well-defined unilocular presentation are usually diagnosed with panoramic radiographs, SBDs with unusual presentations are often misdiagnosed with benign odontogenic inflammatory or cystic lesions and need to be identified with advanced imaging techniques; such as Computed Tomography (CT) or MRI.[8] Radiological artifacts and superimposition of anatomic structures (such as soft palate) can also mimic the SBDs appearance or mask structures in the area. Among three-dimensional advanced imaging modalities, cone-beam CT (CBCT) is preferred to the multi-slice CT (MSCT) because it has a higher spatial resolution and a lower cost and radiation dose.[9] Although the diagnosis of lingual plate defect with CBCT is valid and safe, MRI has the advantage of showing the soft tissue prolapsed into the bony defect without exposing the patient to radiation.[10, 11] Smith et al reported that MRI is the most useful diagnostic tool to discover the content and extent of SBD.[12] Sialography can also be used to determine the presence of glandular tissue within the cavity. However, this procedure is invasive and can be distressful for patients.

Parotid Stafne defect is an infrequent finding, which has two LR and BR variants. The LR type

is located posterior to the mandibular foramen and below the neck of the condyle. Its radiographic appearance is often more circular than the LA and LP variants. The LR variant is usually smaller than the other types.[6]

The incidence of LP varies between 0.10 and 0.48%, and the incidence of LA variant is about 0.009%.[9] Philipsen et al stated that until the year 2002 only 13 cases of LR Stafne defect were reported.[6] The present case was reported due to the scarce abundance of LR Stafne variant, which can mislead a clinician in making a correct diagnosis.

The age range is quite wide, with the highest incidence in the fifth and sixth decades.[3] The higher prevalence in men is documented in different studies.[6]

Since the pathological processes are not involved in the pathogenesis of SBD, it may take several years until the defect is visible radiographically. This is consistent with the fact that SBDs are rarely diagnosed before the age of 40 years.[6]

Etiology and pathogenesis of SBD is not clearly known. It is anatomically related to the salivary glands and may contain adipose tissue, pleomorphic adenoma, connective tissue, lymphoid tissue, skeletal muscle or blood vessels. In some cases, the cavity is completely empty.[2, 4] It is assumed that SBDs may have a common source (Glandular Theory): the pressure by hyperplastic/hypertrophic salivary glands tissues on the bone surface.[13, 14] With age, the major salivary glands, especially the submandibular gland, are the places of non-specific (lymphocytic) inflammatory infiltrations leading to fibrosis, hypertrophy and hyperplasia of varying degrees.[13] These processes will gradually change the soft consistency of the gland to a fibrous tissue mass. In early and middle age, pressure by fibrosis lobe of gland on the mandibular cortex may have sufficient force to cause local bone resorption. It is necessary to consider that the connective tissue that connects the parotid gland to the posterior border of the ascending ramus allows glandular tissue to slide on the bone surface during mandibular movements. This would prevent any certain pressure on the posterior border of the mandibular ramus that could form cavities.[6]

Some tumors like calcified parotid gland adenoma can also create a notch or depression on the posterior border of the mandibular ascending ramus.[6]

Since the size of the SBDs rarely change, they are considered static lesions and a non-invasive method based on periodic control examinations is the proposed process. However, in unusual cases or when there is doubt in the diagnosis, surgical intervention and histopathological evaluation may be necessary.[2]

Conclusion

The purpose of presenting this case is to introduce a rare parotid Stafne defect that was incidentally discovered in a 55-year-old man. The radiologist must be aware of these bone defects in order not to misinterpret them.

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