

# Stafne Bone Defect in Anterior Mandible

## SUMMARY

**Background/Aim:** Stafne bone cavity which is also known as lingual mandibular bone defect is generally seen in the posterior region of the mandible. Stafne bone defects of the anterior mandible are very rare, with around 50 cases reported in the English literature. They are generally asymptomatic and incidental lesion findings may be diagnosed during a radiographic examination. **Case Report:** A 59 year-old female patient was examined for dental complaints. Panoramic radiography revealed a unilocular lesion at the left incisor-premolar area. Dental volumetric tomography scans showed a concavity at the lingual side of the related area. Magnetic resonance imaging was suggested for possible soft tissue pathology and, depending on MRI finding, the cavity was initially diagnosed as Stafne bone defect. **Conclusion:** The aim of this case report is to describe an unusually located Stafne bone cavity with special emphasis to the need of using special imaging modalities.

**Key words:** Stafne Bone Cavity, Anterior Mandible, Cone Beam Computed Tomography, Magnetic Resonance

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## CASE REPORT (CR)

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## Introduction

Stafne bone defect (SBD) which is also called Stafne bone cyst or cavity, mandibular salivary gland inclusion, lingual mandibular bone cavity or aberrant salivary gland; was first described by Edward Stafne at 1942<sup>1</sup>. These defects are generally asymptomatic unilocular radiolucent areas with cortical borders, located at the angle of the mandible below the mandibular canal<sup>1,2</sup>. It appears as a well-corticated radiolucency that retains a normal trabecular pattern internally<sup>3</sup>. SBD is mostly observed in males between 50-70 years old; the anterior variant, which is located in the premolar and canine region, is a rare occurrence<sup>1,2,4</sup>. Incidence of the anterior bone defects are reported to be between 0.009-0.48% in the literature<sup>1</sup>. Although aetiology of SBD is unknown, it is also suggested that the main cause of SBDs might be alterations in the trabecular bone pattern due to ischemia<sup>5</sup>.

Such bone cavities in the anterior mandible are rare therefore, it may be difficult to diagnose and to rule out other radiolucent lesions, such as traumatic and cystic lesions or tumours of the jaw<sup>6,7</sup>. Surgical intervention is

not advocated for the treatment of anterior or posterior SBD. Surgical intervention or biopsy should be performed in atypical cases or in the presence of other suspected lesions<sup>6</sup>.

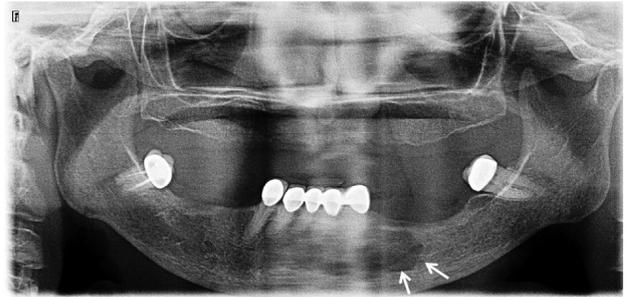
The aim of this report is to present a case with unusually located SBD with special emphasis to the radiographic features, differential diagnosis and the use of imaging modalities.

## Case Report

A 59-years-old female patient was referred to the Department Oral and Maxillofacial Radiology, Faculty of Dentistry, Istanbul University, for an assessment of dental complaints and the pain on the left side of the mandible. The patient's medical history revealed mild hypertension, gastric ulcer, seronegative arthritis and postmenopausal osteoporosis. She also stated that she was using 70 mg once a week alendronic acid per oral (Fosavance, Merck Sharp&Dohme, Haarlem, Holland) for the last ten years.

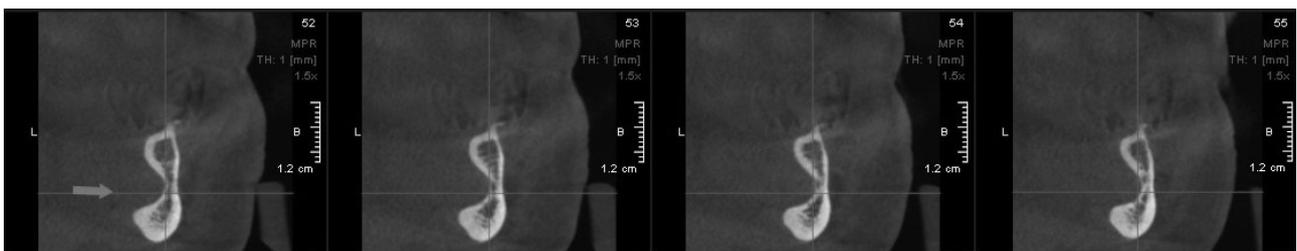
Extra-oral head and neck examination was normal. A thorough physical examination revealed no facial asymmetry, swelling or lymphadenopathy. Therefore, infection was not considered. Intraoral examination revealed gingivitis, bacterial plaque accumulation, multiple metal fused porcelain bridge and partial denture at the lower jaw and complete denture at the upper jaw. During palpation at the lingual plate no concavity/convexity was detected.

The panoramic radiograph (Kodak 8000 Digital Panoramic System, France) was taken (parameters of the device were Kv: 68, mA: 5 and s: 13.2); it showed unilocular periapical radiolucency between the apices between left incisor and premolar teeth and in front of the left mental foramen. Also the radiolucency was observed as it was related with the apices of left incisor-premolar teeth. During palpation at the lingual plate, patient had pain in the related area (Figure 1).



*Figure 1. Patient's panoramic radiography, revealing a radiolucent area between left incisor and premolar region*

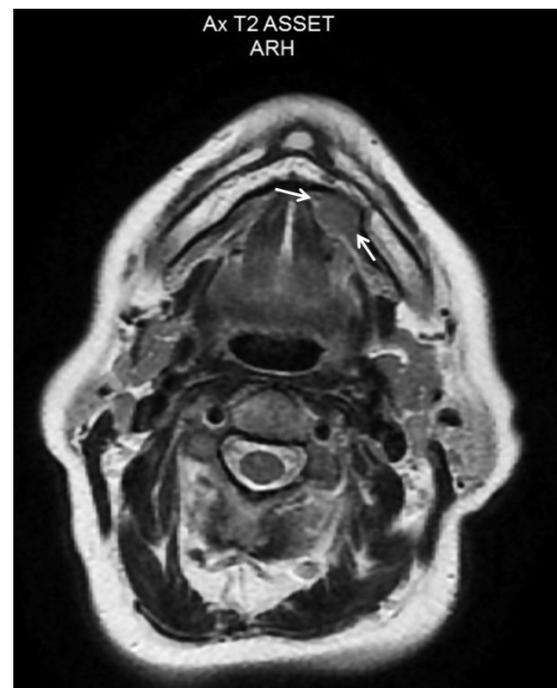
In an attempt to rule out possible Stage 0 BRONJ and to examine the lesion, it was decided to perform a CBCT dental volumetric tomography (Vatech Pax - Flex 3D, 2013, Korea) Parameters of the device were Kv:89 mA: 5 s:12 FOV: 5\*10. Cross-sectional and axial images showed a concavity at lingual side of the mandible and no radiolucent area at a cancellous region (Figure 2 & 3).



*Figure 2. Cross-sectional images showing the lingual concavity at the related area*



*Figure 3. Axial tomographic slice showing the lingual concavity of the mandible*



*Figure 4. Axial T2-weighted magnetic resonance imaging (MRI) revealing the isointense structure with salivary gland*

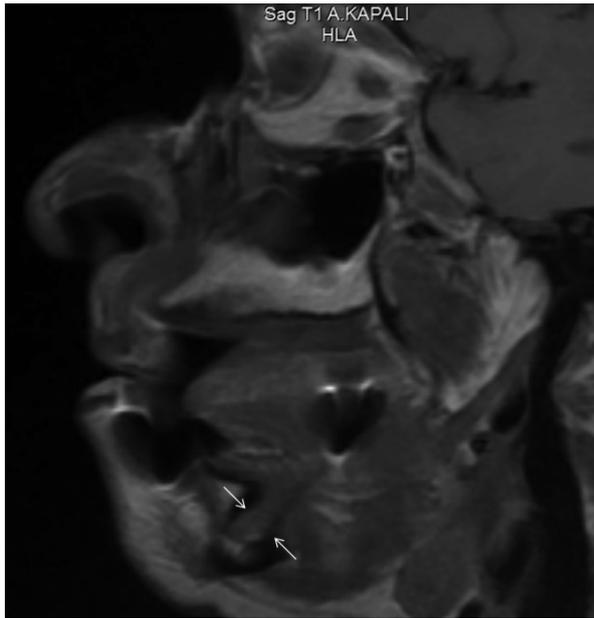


Figure 5. Sagittal T1-weighted magnetic resonance imaging revealing isointense structure with salivary gland

MRI (GE Signa HDe 1.5T, 2007 US.) was recommended for possible soft tissue pathology. Depending on T1 and T2-weighted magnetic resonance imaging, soft tissue signal intensity was equivalent to that of salivary glands (Figures 4 & 5). Analysis of this reference, revealed normal glandular tissue, thus confirming the diagnosis of SBD.

Patient was informed about the lesion which didn't need surgical intervention and was called for routine follow-up for 6 months.

## Discussion

SBDs are generally asymptomatic, unilateral, oval shaped lesions that are diagnosed accidentally on panoramic radiographs. They are often located at the posterior mandible below the mandibular canal<sup>1,2,7</sup>. Just a few cases with pain at relevant area were reported before<sup>1</sup>. SBDs located in the anterior area of the mandible are rare and they were observed in premolar-canine region<sup>1,2,4</sup>. SBDs may be either empty or may contain blood vessels, connective tissue fat, lymphoid tissue, muscle and salivary gland<sup>1,8</sup>. The aetiology of the SBDs is still unknown but some theories are present in literature. Pressure of the salivary gland tissue, remains of solitary bone cysts, localized relative ischemia are some of the theories to explain SBD's aetiology<sup>1</sup>.

Differential diagnosis includes odontogenic cysts, lateral periodontal cysts, traumatic bone cyst, eosinophilic granuloma, ameloblastoma, central giant cell granuloma, benign tumours and bone metastasis<sup>7,8</sup>. If the bone cavity

is related to root apices on the panoramic radiography, it can mimic an odontogenic cyst. The presence of caries and changes or absence in the lamina dura of the teeth adjacent to the lesion may give the clinician clues for the accurate diagnosis. To avoid an unnecessary endodontic treatment, a pulp vitality test should be performed<sup>8,9</sup>. Lateral periodontal cysts are considered to originate from epithelial rests in periodontium lateral to the tooth, in a unilocular appearance. Lateral periodontal cysts are generally asymptomatic and present a round or oval uniform lucency with well-defined borders radiographically<sup>7,10</sup>.

The traumatic bone cyst, belongs to the category of 'pseudo-cyst' due to its lack of a lining epithelial membrane<sup>11</sup>. Traumatic or simple bone cysts mostly appear to be scalloped between the roots of the teeth. Scalloped appearance can be distinguished from other lesions<sup>7</sup>. Ameloblastomas are benign odontogenic neoplasms of epithelial origin and represent about 10% of odontogenic tumours<sup>12</sup>. The unilocular type of ameloblastoma can mimic SBDs in the anterior region of the jaws. In addition, root displacement, resorption and expansion of the jaws can be observed<sup>7,12,13</sup>. Displacement of teeth, painless swelling and expansion of bone can potentially be caused by giant cell granulomas. Some of the panoramic radiography signs can be bone destructions, divergence of roots and resorption of the lamina dura<sup>7,12</sup>. Other lesions that can mimic SBDs are neurofibroma, arteriovenous fistulas, brown tumours, eosinophilic granulomas, central haemangiomas, multiple myeloma and bone metastasis<sup>7,13</sup>.

Panoramic radiography is a 2-dimensional method and may be insufficient to distinguish concavities from intraosseous lesions. Multi-planar imaging techniques like CBCT, CT and MRI can be used to identify SBDs but due to high dose and cost of CT examination, CBCT seems to be valuable option for detecting bony defects<sup>8</sup>. Especially in atypical cases with anterior location, CBCT and MRI imaging are recommended<sup>8</sup>. In the present case, both pain at the relevant area and anterior location of the lesion, CBCT and MRI were performed to rule out possible other pathologies. MRI proton density and T1-weighted images may be used for examining the soft tissue lining the cavity whether isointense of the lesion equivalent to that of the salivary gland<sup>7,14,15</sup>. MRI has the advantages such as not using any ionizing radiation, and the ability of imaging the soft tissue detail that may line the cavity<sup>8</sup>. It's main disadvantages are the cost and field distortion artefacts from dental material<sup>7,16</sup>. Accurate visualization of these tissues is obtained with a 1.0-mm slice thickness, provided an sufficient quantity of saliva is present<sup>7,14,17</sup>. MRI revealed the isointense structure with salivary gland in the present case. Due to salivary gland presence in the cavity, salivary glands pressure may be a reason for the SBD in this case.

Unlike other lesions, SBDs have been observed anatomically. Radiologic diagnosis by use of different techniques such as CBCT and MRI with routine clinical follow-up, would be more conservative than surgical intervention or biopsy<sup>7,18</sup>. In our case, both MRI and CBCT images revealed no pathology at the related area; therefore, surgery was not considered.

## Conclusions

Stafne bone defects in the anterior mandible are very rare; therefore, a radiolucency at the anterior mandible could be difficult to diagnosed and rule out other pathologies. For that reason, a diagnosis of SBD should also be taken into consideration when a radiolucency at the anterior mandible was observed.

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