**Original Research**

# Bilocular Stafne Bone Defect above And Below the Inferior Alveolar Canal Assessed by Cone Beam Computed Tomography: A Case Report

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**Abstract**

Stafne bone defect is a bone depression containing salivary gland or fatty soft tissue on the lingual surface of the mandible. The most common location is within the submandibular gland fossa and often close to the inferior border of the mandible. This defect is asymptomatic and generally discovered only incidentally during radiographic examination of the area. Stafne bone defect appears as a well-defined, corticated, unilocular radiolucency below the mandibular canal. Although it is not uncommon for this defect to appear as a round or ovoid radiolucency, it is rarely seen as a multilocular radiolucency. This report presents a case of a developmental salivary gland defect with multilocular radiolucency above the inferior alveolar canal in a male patient.

**Key words:** Stafne bone defect, Bilocular, inferior alveolar canal, CBCT.

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## Introduction

Stafne bone cyst is in fact a mandibular bone defect on the lingual side that was first described by Edward Stafne in 1942 (1). However, since then scientists have given it different names according to descriptions they had of its etiology, including: Stafne bone cavity, static bone cavity, lingual mandibular bone defect, idiopathic bone cavity and Stafne cyst (2-6).

Based on the location of lingual defect, it is classified into two major subgroups of posterior lingual variation that is located between the first permanent molar and mandibular angle below the inferior alveolar canal and the anterior lingual variation located in the anterior mandible (7).

Radiological studies have reported a prevalence of 0.1% to 0.48% for posterior lingual subgroup, while studies on the skull shows a prevalence of 6.06% (2). The patients have a broad age range from 11 to 78 years old with the peak incidence in the fifth and sixth decades of life (8).

There are a number of different theories to explain the cause of this condition. Recently, most authors believe that this cavity originates from the pressure of salivary gland tissue on lingual mandibular cortex and therefore, associate submandibular gland with posterior subgroup and sublingual gland with anterior subgroup (2).

Diagnosis of this defect is accidental because most patients do not present any clinical signs (5). Diagnosis

is quite possible as long as the Stafne cyst shows normal features and location in panoramic radiographs. However, when the position of the cavity is unusual, complementary diagnostic techniques such as CT scan, CT scan with sialography, and ultimately exploratory surgery and biopsy should be employed. MRI can also be useful when exploration of inner cavity tissue is needed (9).

## Case report

A 48-year-old man was admitted to the Radiology Department of Mashhad School of Dentistry for taking radiographs for a routine dental examination. The patient had no particular history of any diseases. Extra oral examination showed no facial asymmetry. Intraoral examination showed no particular problem and mucosa was completely normal. The patient's condition was satisfactory in terms of dental caries and periodontal status. Panoramic x-ray revealed a bi-locular radiolucency with clear sclerotic boundary, above and below the inferior alveolar canal in the right mandibular body at the root of the second molar (Fig. 1). Interestingly, the second molar had undergone root canal therapy and had extensive caries.

Because of the unusual shape of the lesion, CBCT was performed for a more precise examination of the lesion. In CBCT images, there was an obvious defect on the lingual side of the mandibular body above the canal (Fig. 2).

A bilocular Stefne bone cyst above the canal was diagnosed based on panoramic and CBCT images and lack of any particular clinical signs. The patient was advised to return in 6 months in order to measure the size of the radiographic defect (Fig 3).The size and shape of defect had remained unchanged after ten months.

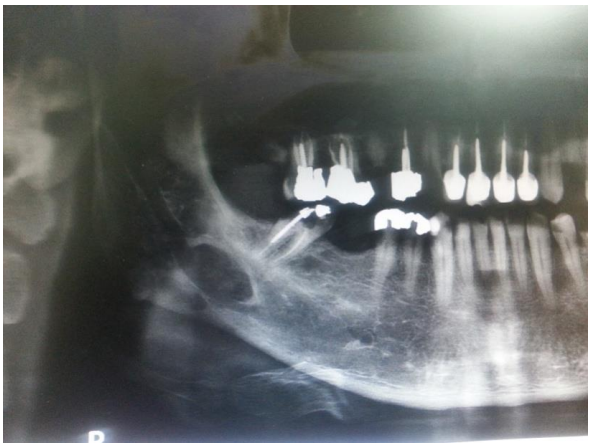

**Figure 1.** Panoramic x-ray reveals a bilocular radiolucency with clear sclerotic boundary, above and below the inferior alveolar canal at the root of the second molar in the right mandibular body.

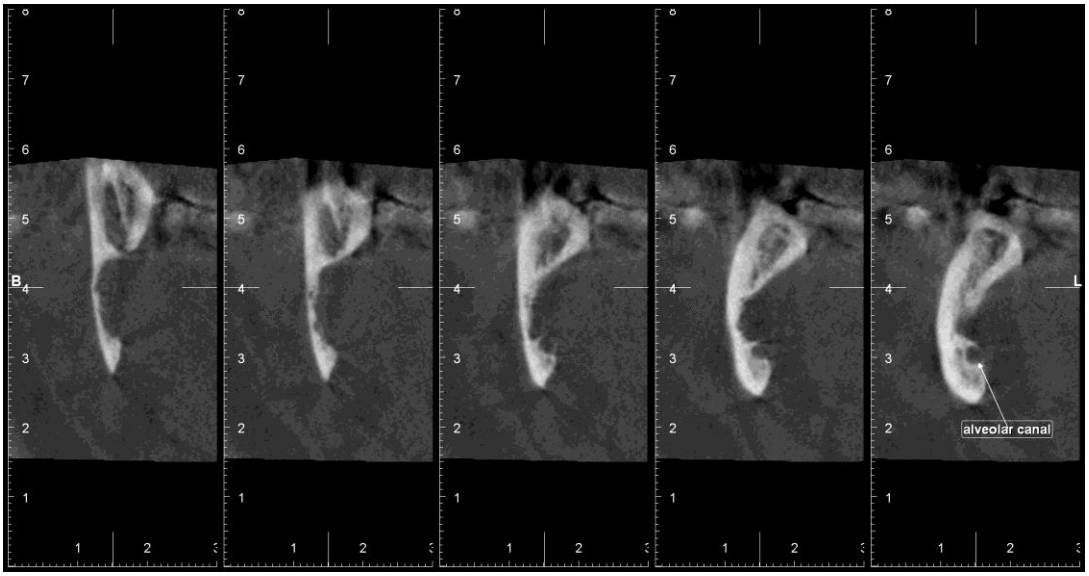


**Figure 2.** Stafne bone cyst above the inferior alveolar canal


**Figure 3.** Panoramic radiograph ten months later.

## Discussion

Stafne bone cyst is normally asymptomatic and non-palpable, and is usually detected in routine radiographic examinations (3). The age range is quite broad, and it occurs in men 6 times more than in women (8). The presented case was a 48-year-old man. Many case reports have revealed the presence of glandular tissue in Stafne bone defects. However, other tissues are also found in these defects, including pleomorphic adenoma, muscle, lymphoid tissue, adipose tissue, blood vessels, and fibrous connective tissues (8,10-12).

On panoramic radiograph the defect appears as a circular or ovoid well-defined radiolucency with sclerotic boundaries that ranges in diameter from 1 to 3 cm located between lower first molar and mandibular angle below the inferior alveolar canal (2,13). Although the multilocular variation is rare, (8,14,15) a bilocular radiolucency with a clear sclerotic boundary is evident in panoramic image of the present cyst; a rarely seen view of Stafne bone cyst.

Characteristically, this defect is situated just above or at the inferior border of the mandible, and always below the inferior alveolar canal (14). In the panoramic image of the present case, the defect appears as a double-lobule lesion with defined sclerotic boundary above the inferior mandible border and it seems the lesion is located within the canal.

Although panoramic radiographs are usually adequate for detecting the presence and size of Stafne bone cysts in the posterior region (3), for a more precise examination of unusual double-sided lesions of the anterior and for multilocular Stafne defects like the present cyst, more advanced imaging techniques are required (16,17).

Furthermore, in some cases, exposure or positioning errors leads to changes in shape and density of lesions in panoramic images, which affects proper interpretation. This can be another reason for prescribing complementary radiography (18,19).

CT and MRI are now the preferred techniques since axial radiographic sections are crucial for a definitive diagnosis and demonstration of the size and extension of the lesion. (20). Although MRI is superior to CT as patients are not exposed to ionizing radiation, its use is not as common due to increased cost and the presence of metallic artifacts (21) .

Compared to conventional CT, CBCT is a high resolution, low radiation technique that provides accurate data on the shape and size of Stafne bone defect. (22,23) However, it cannot provide any information about soft tissue or contents of the cavity (24). For a more accurate examination of lesion, we used CBCT images in which the lesion appeared as a bilocular defect with irregular walls above the canal.

In the present study, depth, width and length of concavity were 4.16, 14.95 and 15.37 mm, respectively, which are similar to the values from previous studies (7.9-16.3mm) (9).

Given the dimensions of the cavity and relationship with buccal cortex, this bone concavity is divided into three groups: 1. concave base does not reach the buccal plate, 2. concave base reaches the buccal plate, and 3. concave base is identified by distension of the buccal cortical plate (25). In our patient, CBCT findings indicate a type 1 relationship to the buccal cortex.

Sialography has also been recommended for detection of salivary gland tissue in this bone defect, but this technique is difficult to perform and may cause discomfort for the patient (26).

Since Stafne bone defect is in fact an anatomic variation, no surgery is required (8). This defect should be managed conservatively and with radiological follow-up, any changes in size or shape of the lesion need to be detected (20).

Considering the shape and size of the present defect in panoramic and CBCT images, no biopsy or surgery was indicated. The size and shape of the defect had remained unchanged in ten-month follow-up.

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