

## Case Report

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# Radiologic diagnosis of an atypical multilocular Stafne bone lesion

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## Abstract

**Background:** The typical patient diagnosed with a Stafne cyst is male and 40 to 60 years old. The ovoid cavities are usually located lingual in the molar region of the lower jaw underneath the inferior alveolar nerve and appear unilateral. The bone lesion is most probably caused by the pressure of the submandibular gland against the lower jaw bone.

**Case presentation:** A 48-year old patient was referred to the department of oral surgery of the dental university clinic in Vienna by a local dentist, following a diagnosis of two apparent cavities identified by a panoramic x-ray. The findings in the panoramic x-ray and CT scan were inconclusive.

The surface of the two lingual open, ovoid cavities in the left mandibula exposed plain cortical bone. In the MRI-scan, adipose, lymphatic and gland tissues were found which are characteristic features of Stafne cyst bone cavities.

**Conclusion:** Diagnosing a Stafne cyst on a panoramic x-ray is almost impossible. Further radiologic investigation is essential in order to exclude differential diagnoses. A CT scan can verify the typical lingual opening of the cavity. The diagnosis of a Stafne cyst can only be made by assessing the soft tissue contained in the cavity, therefore a MRI scan is highly recommended.

**Keywords:** bone lesion; stafne; MRI; radiology; oral surgery; dentistry.

## Introduction

Edward C. Stafne first described 35 cases of unilateral, asymptomatic, ovoid radiolucencies in 1942 [1]. In panoramic radiographs, these lesions are typically located in the posterior region of the mandible, distal to the third molar and caudal of the inferior alveolar nerve, limited by the mandibular border and the mandibular angle. The borders of the lesion shown in a panoramic radiograph can be either sharply defined or indistinct. Due to the missing epithelial lining a Stafne cyst is also

called a “pseudocyst”. Due to the prevalence of 0,5%, the Stafne bone cavity (SBC) is a rare lesion of the mandible [2]. The highest prevalence is reported in 40 to 60 year old males years [3]. The etiology of SBC is still under debate but studies suggest that persisting localized mechanical pressure exerted by the submandibular or sublingual glands is responsible for the bone defect [2,4,5]. Due to the wide range of possible differential diagnoses—from benign to malign lesions - further radiologic investigation such as computer tomography (CT) or even a surgical biopsy is

necessary in order to set a definite diagnosis [2,6]. Histologic analysis showed that SBC lesions contain adipose, lymphatic and gland tissues [7]. In order to evaluate the soft tissue without surgical intervention or other invasive treatment modalities including endodontic therapy, bone trephination and bone exploration surgery, a magnetic resonance imaging (MRI) scan has been suggested in the diagnostic algorithm for SBC [2,8]. The case report below details a rare case of multilocular SBC and its diagnostic challenges at the dental university clinic in Vienna.

### Case presentation

A 48-year-old male patient was referred to the department of oral surgery of the dental university clinic in Vienna for further evaluation of two ovoid radiolucencies found in the left mandible by his local dentist on a panoramic radiograph. The patient showed no relevant medical history and had no complaints in the area of the questionable osteolysis. Alcohol and tobacco were only consumed occasionally.

Neither intraoral nor extraoral clinical examination showed any mentionable findings. First and second left lower molars reacted positively to pulp sensitivity testing with CO<sub>2</sub>-snow. In the region of the mental nerve no paresthesia or hypoesthesia was recorded.

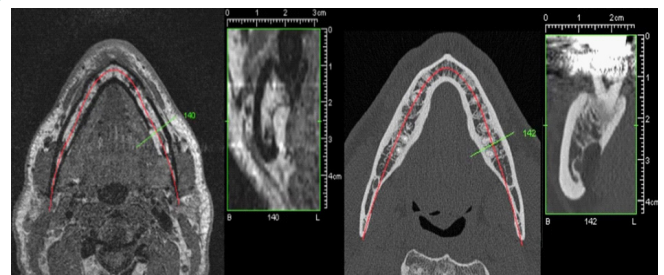
The panoramic radiograph showed two ovoid radiolucencies with well-defined peripheral borders in the lower left jaw, one apical of the second left lower molar overlaying the inferior alveolar nerve and one in area of the third left lower molar caudal of the inferior alveolar nerve.

Based on the findings in the panoramic radiograph and the positive pulp sensitivity test of the teeth in the area, the preliminary diagnosis of SBC with untypical multilocalisation was made. Differential diagnosis included traumatic or solitary bone cysts, odontogenic cyst and odontogenic tumor.

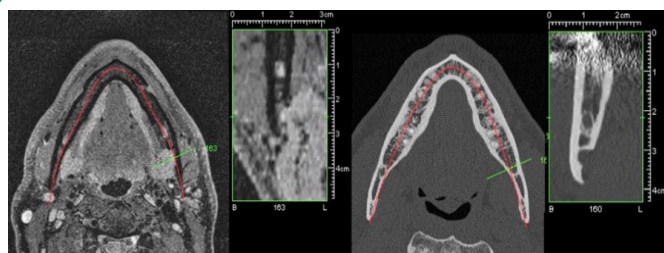
The next diagnostic step was to perform a multislice-CT scan (Definition AS, Siemens Healthineers Group, Erlangen, Germany) of the lower jaw with 0,5 mm axial slice thickness. The scan revealed two bone pits on the lingual side of the described area of the left mandible. The anterior lesion showed no cortical limitation of the inferior alveolar nerve. Due to the highly spongy bone structure around the anterior lesion, its appearance seemed "soap bubbly". The distal lesion showed a well-defined cortical outline without direct contact to the lower alveolar nerve. Both cavities contained soft tissue but further assessment could not be made by analyzing the CT scan.

To ensure the correct diagnosis of SBC and enable evaluation of the soft tissue contained in the cavities without surgical intervention, a MRI scan was carried out and the proton-weighted and T<sub>1</sub>-weighted sequences were assessed. Results indicated that the soft tissue - consisting of adipose-, lymphatic- and gland-tissue was part of the left submandibular gland.

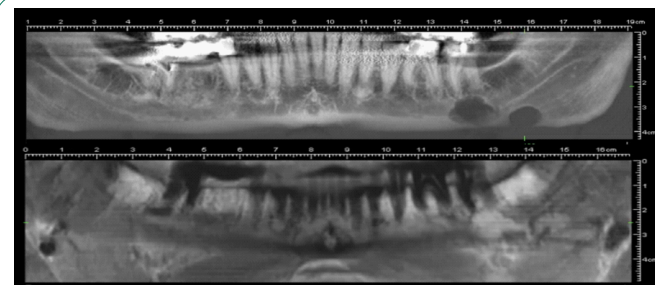
Due to the findings presented by the CT and MRI scan, differential diagnoses like cystic processes or neoplastic formations were excluded and the final diagnosis of SBC with untypical multilocular configuration without any need of surgical treatment was made.



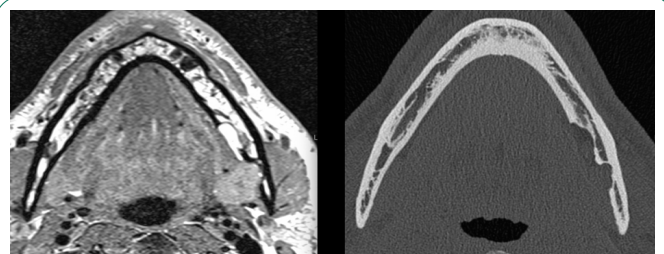
**Figure 1:** Lingually open cavity with cortical lining in the region of the second molar shown by CT scan. MRI (T<sub>1</sub> sequence) scan showed fat tissue in the bone pit.



**Figure 2:** Lingually open cavity with cortical lining in the retromolar region shown by CT scan. MRI (T<sub>2</sub> sequence) scan showed gland tissue of the submandibular gland in the bone pit.



**Figure 3:** Panoramic view of CT & MRI scan. MRI (proton weighted) shows fat tissue in the anterior lesion and gland tissue in the distal bone defect.



**Figure 4:** Horizontal view of the lower jaw in MRI (proton weighted) & CT scan. Findings in the CT scan allow no assessment of the soft tissue. MRI scan shows fat tissue in the anterior lesion and gland tissue in the distal bone defect.

## Conclusion

In order to ensure the diagnosis of SBC after a panoramic radiograph and well performed clinical intra- and extraoral examination including sensitivity testing of the bordering teeth, a MRI scan is highly recommended to avoid invasive intervention and decrease the patient's exposure to radiation. In case of a possible identification of a further progressed lesion, radiographic follow-up is recommended.

## Declaration

**Ethics approval and consent to participate:** For writing and publishing this case report no ethics approval was necessary. The patient gave consent to publish his case and radiologic examinations.

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**Availability of data and materials:** Further information and material are available from the corresponding author on reasonable request.

**Competing interests:** The authors declare that they have no competing interests.

**Author's contributions:** TL was involved in the design of the case report, investigation and writing the manuscript. AG, CU and AM were involved in the design of the case report, investigation and submission of the manuscript. All authors read and approved the final manuscript.

**Consent for publication:** Not applicable.

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