INDONESIAN JOURNAL OF DENTISTRY
Faculty of Dentistry Universitas Muhammadiyah Semarang

Indonesian Journal of Dentistry
Volume 6 No. 1 (2026): February
DOI: https://doi.org/10.26714/ijd.v6i1.20295

CASE REPORT

Panoramic Features of a Stafne Bone Defect Mimicking a Residual Cyst in an Edentulous Mandible

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ARTICLE INFO

Keywords:
CBCT; Panoramic Radiography; Residual Cyst; Stafne Bone Defect

Article History:

Received : 30/12/2025
Revision : 09/01/2026
Accepted : 02/02/2026
Published : 11/02/2026

ISSN: 2775-0159

ABSTRACT

Background: Stafne bone defect is an uncommon, well-defined lingual cortical depression of the mandible, most often discovered incidentally as a unilocular radiolucency in the posterior region, and is regarded as a benign developmental anomaly related to soft-tissue inclusion, particularly salivary glands. Classic lesions typically occur below the inferior alveolar canal in middle-aged male patients, are asymptomatic, and do not require surgical treatment; however, anterior variants located in the premolar region are rare and frequently mimic odontogenic cysts on panoramic radiographs.
Objective: The purpose of this case report is to highlight the diagnostic challenge of an anterior variant of Stafne bone defect and demonstrate the importance of advanced imaging in differentiating it from odontogenic lesions to avoid unnecessary surgery.
Case: A 60-year-old edentulous male patient underwent panoramic radiography as part of a pre-prosthetic evaluation. The image revealed a well-defined radiolucent area in the edentulous mandible, leading to a provisional diagnosis of a residual cyst.
Outcome: Further evaluation with Cone Beam Computed Tomography (CBCT) was performed. The three-dimensional images revealed a well-circumscribed lingual cortical depression in continuity with the mandibular cortex. There was no evidence of buccolingual expansion, root resorption, or features of an intraosseous cystic cavity. These imaging characteristics confirmed that the radiolucency represented a static bone concavity rather than a space-occupying lesion..
Conclusion: The lesion's location and specific imaging characteristics were consistent with a Stafne bone defect. The use of CBCT was definitive in excluding a residual cyst, thereby preventing an unnecessary surgical intervention and confirming the benign, static nature of the defect.

Citation (Vancouver style):

Sukmadewi PM, Kristanto R, Putri KAAP. Panoramic features of a stafne bone defect mimicking a residual cyst in an edentulous mandible. Indones J Dent. 2026;6(1), 32-39.

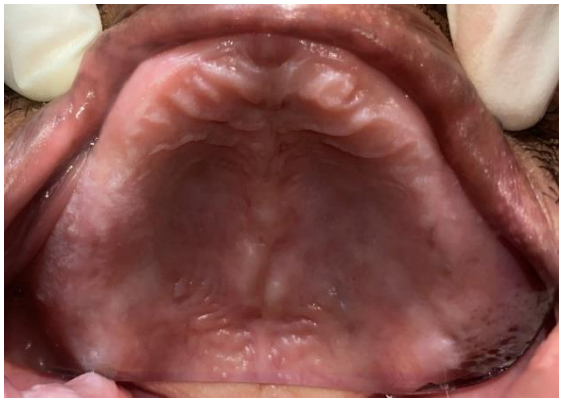
INTRODUCTION

Stafne bone defect is a developmental, asymptomatic lingual mandibular bone depression that appears on panoramic radiographs as a well-defined, usually unilocular, and partially radiolucent defect, most often located below the mandibular canal in the posterior mandible, and can closely mimic a cystic lesion.[1–5] A residual cyst, in contrast, is an inflammatory odontogenic cyst that persists in an edentulous area after extraction of the causative tooth and typically presents radiographically as a well-defined, unilocular, round or oval radiolucency with a thin sclerotic margin in the posterior mandible of elderly edentulous patients; this overlapping radiographic appearance explains why an anterior or posterior stafne bone defect in an edentulous mandible may initially be misinterpreted as a residual cyst on panoramic imaging.[1–10]

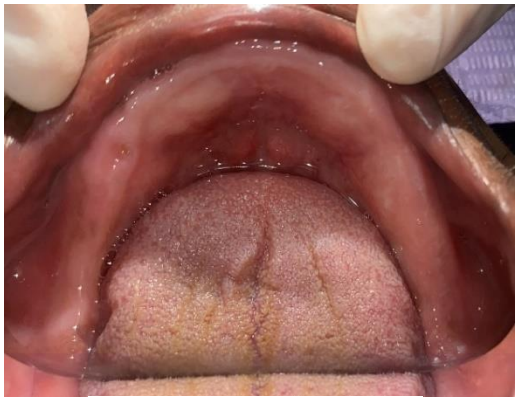
Stafne bone defect is a rare, benign, static mandibular concavity with low prevalence, a marked mandibular–male–posterior predilection, and a pathogenesis most likely related to pressure from adjacent salivary glands on the lingual cortex.[11] Prevalence of stafne bone defect is about 0.08–0.17% of examined individuals, indicating that it is an uncommon finding compared with odontogenic cysts. For the classic posterior lingual variant, reported radiographic incidence ranges roughly from 0.10% to 0.48%, while cadaver studies show higher rates up to about 6%, suggesting that many small defects are not visible on routine radiographs. Studies consistently show higher frequencies in men than women, with male proportions around 70–86% of cases and most patients diagnosed in the fifth to seventh decades of life (mean ages around 49–57 years).[12]

CASE REPORT

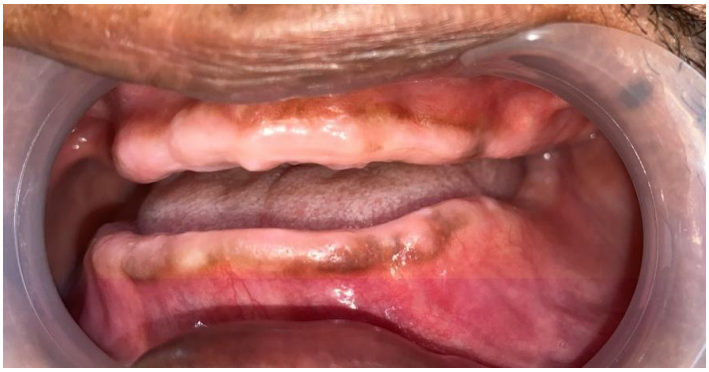
A 60-year-old male patient was referred to the Department of Radiology, Udayana University Dental Hospital, by the Prosthodontics Department for a panoramic examination prior to fabrication of complete maxillary and mandibular dentures. Intraoral examination revealed a fully edentulous mandible with no clinical evidence of swelling or soft-tissue abnormality (Figure 1). The patient reported that his last extractions involved teeth 34, 35, 37, and 38, which had been removed 3 years earlier, with a history of periapical infection associated with tooth 37 before extraction but no pain or discomfort in the mandibular region since then.



A. Maxilla



B. Mandibula



C. Left Mandibular Lateral Side

Figure 1. Intraoral examination revealed no visible swelling in the maxillary or mandibular regions (personal archive)

Panoramic radiography demonstrated a well-defined radiolucent area with relatively corticated margins in the left posterior mandible, corresponding to the edentulous region of teeth 36–37 and located in close proximity to the left mandibular canal (Figure 2) , leading to an initial radiographic impression of a possible residual cyst in the area of the previously infected tooth 37. In view of these findings, the Prosthodontics Department requested a cone-beam computed tomography (CBCT) scan to further evaluate the lesion detected in the edentulous mandibular region before definitive prosthetic rehabilitation.

CBCT examination revealed a unilateral, well-defined, ovoid radiolucency located in the posterior mandible within the edentulous area, measuring approximately 7.3 × 13.7 mm. The lesion did not show cortical expansion, but there was thinning of the lingual cortical plate with a slight cortical defect on the lingual aspect. On 7 × 7 pixel ROI analysis, the lesion revealed lower density than the adjacent cortical bone, and the attenuation pattern suggested that the defect was unlikely to be filled by simple cystic fluid, supporting the impression of a stafne bone defect rather than a true intraosseous cystic lesion (Figure 3).

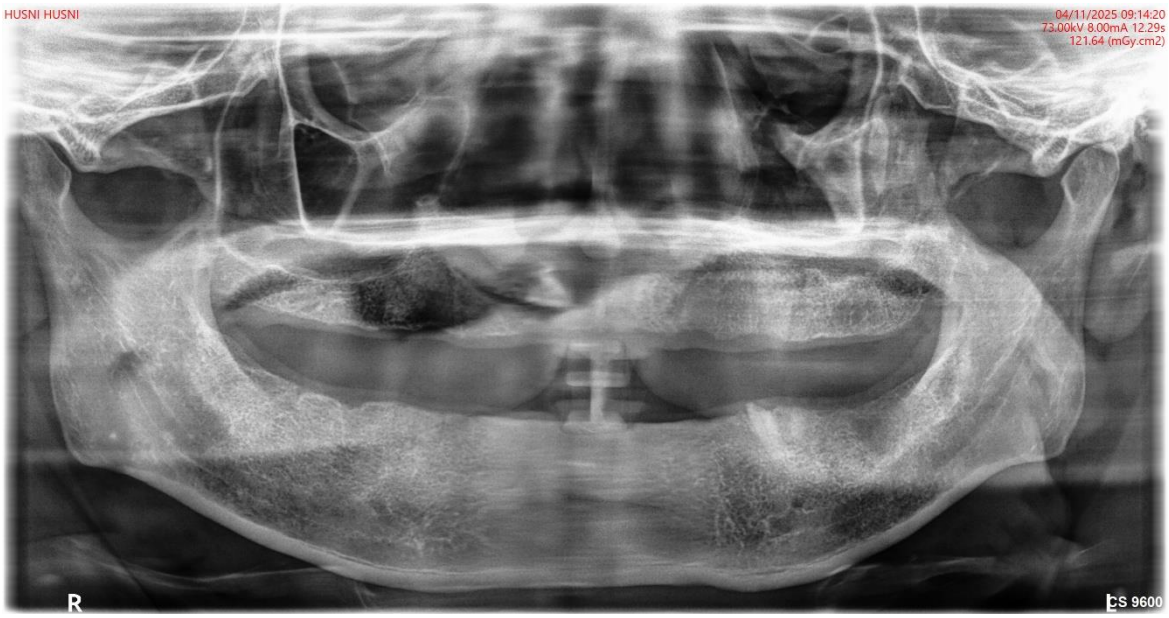


Figure 2. Panoramic radiographic examination shows a radiolucent area in the left posterior mandible with well-defined, slightly corticated borders (black arrow), with the lesion extending toward and approaching the left mandibular canal (red arrow) (personal archive).

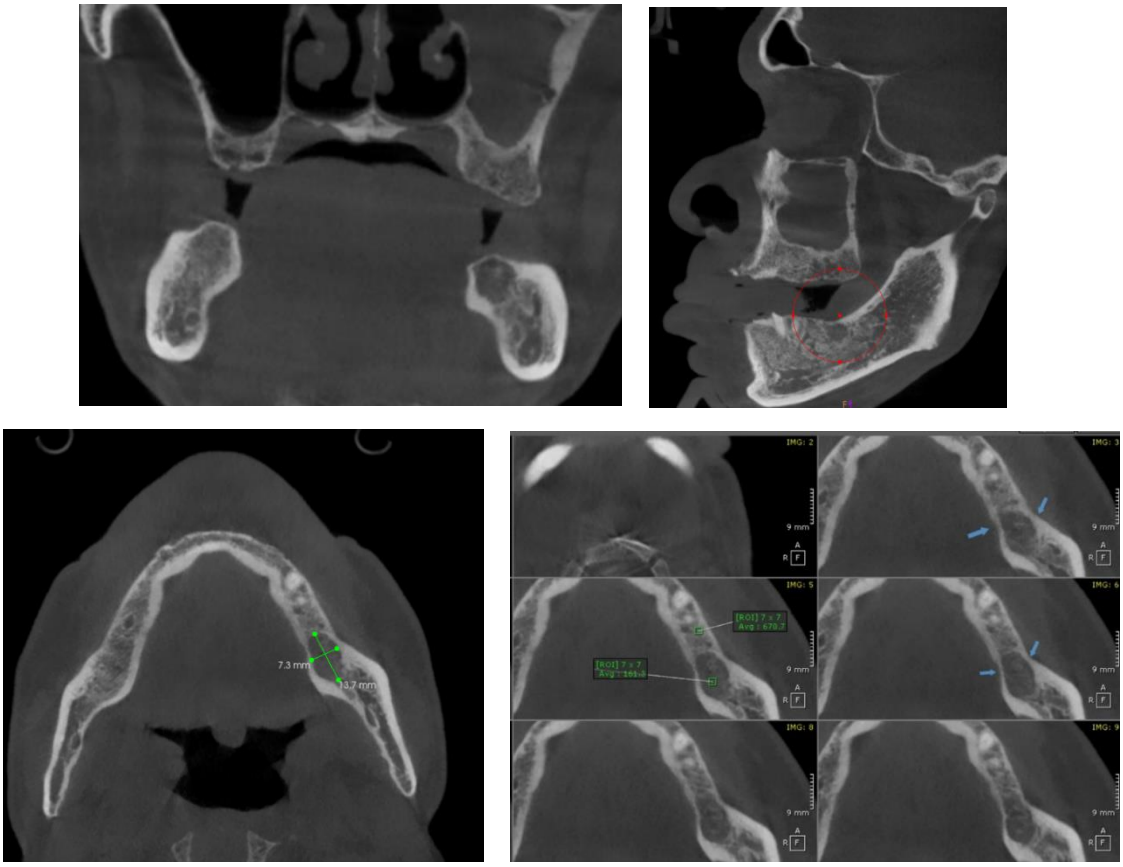


Figure 3. CBCT examination (Coronal, Sagital and Axial view) shows a radiolucent area in the left posterior mandible with well-defined, with corticated borders, cortical thinning is observed of the lingual cortical plate with a slight cortical defect, unilocular defect with no associated cortical expansion (personal archive).

DISCUSSION

Stafne bone defect (often termed Stafne mandibular bone cavity or benign mandibular concavity) was first described in 1942 as a static, well-circumscribed radiolucent area near the mandibular angle, located below the mandibular canal. These cavities represent lingual cortical depressions that may contain salivary gland tissue, fat, vessels, lymphoid tissue, or a mixture of soft tissues, and they lack an epithelial lining, so they are pseudocysts rather than true cysts.[11,12] Epidemiologic series report a strong male predominance (roughly 4–7:1), with diagnosis most often in the fifth to seventh decades and very few cases under 30 years, supporting an acquired rather than congenital development. Radiographic prevalence in large panoramic cohorts ranges around 0.08–0.13% overall, with posterior SBD 0.10–0.48% and anterior variants extremely rare (≈0.003–0.03%).[13,14]

Most stafne bone defects are discovered incidentally in asymptomatic adults during routine panoramic examinations, without swelling, mucosal change, or sensory disturbance. Extraoral and intraoral examinations are usually within normal limits; teeth in the involved region are vital, and there is no cortical expansion in typical posterior lesions, although rare buccal expansion and atypical anterior cases have been reported.[11,12,15]

On panoramic radiographs, stafne bone defects typically appear as a unilocular, round or ovoid radiolucency with a well-defined, often sclerotic border below the mandibular canal in the molar–angle region, frequently continuous with or just above the inferior border of the mandible. Atypical anterior variants present as well-circumscribed radiolucencies in the canine–premolar region, sometimes superimposed on tooth apices and mimicking periapical or residual cysts, but the periodontal ligament space and lamina dura remain intact and teeth test vital.[4,12–21]

CBCT and CT demonstrate a lingual cortical depression with preservation or thinning of buccal cortex; in posterior SBD, lesions are usually unilateral, oval/round, with completely hypodense internal content and thick sclerotic margins, often in continuity or contiguity with the inferior mandibular border. Depth relative to the buccal cortex can be classified (Ariji): type I (does not reach buccal cortex), type II (reaches without expansion), type III (expands buccal cortex), and CBCT studies show most cases as type I–II with residual buccal cortical thickness ≥0–1.3 mm.[12–16,19]

Topographically, four main variants are described: lingual posterior (submandibular fossa), lingual anterior (canine–premolar region above mylohyoid), lingual ramus (near

mandibular neck), and buccal ramus concavities. Posterior lingual stafne bone defect is by far the most frequent; anterior, ramus, multiple, bilateral, and buccal variants are rare but well documented.[12,13,17,19] Stafne bone defect and odontogenic or residual cysts may all appear as well-defined unilocular radiolucencies with sclerotic borders, particularly when stafne bone defect occurs anteriorly or near edentulous areas. Key differentiating features include.[1,2,6,11]

The present case illustrates an incidental radiolucent lesion in the left posterior mandible of an edentulous 60-year-old male that closely mimicked a residual cyst associated with a previously infected tooth 37, both in location and panoramic appearance. Although the age, sex, and posterior mandibular site are compatible with the classic epidemiological profile of Stafne bone defect (SBD), the radiographic presentation was atypical because the lesion arose in an edentulous area formerly occupied by an infected tooth and simulated a post-extraction cystic cavity on panoramic imaging.

In contrast to typical posterior SBDs, which are usually identified below the mandibular canal in dentate patients and recognized relatively easily by their characteristic topography, SBDs that project into edentulous regions or overlap previous extraction sites can resemble odontogenic or residual cysts, much like the anterior and other atypical variants reported in the literature. In the present case, the well-defined ovoid radiolucency with corticated margins in the 36–37 region, together with a history of periapical infection, supported an initial impression of residual cyst rather than a developmental bone concavity.

CBCT examination of the edentulous posterior mandible reveals a unilateral, well-circumscribed radiolucent defect measuring approximately 7.3 × 13.7 mm. The finding corresponds to an Ariji type I–II morphology, with thinning but no expansion or perforation of the buccal cortex. The internal density was lower than adjacent cortical bone and the attenuation pattern did not suggest a simple fluid-filled intraosseous cyst, aligning with reports that SBDs often contain soft tissues such as salivary gland, fat, or vascular structures rather than cystic content. These findings, together with the lack of symptoms, absence of cortical expansion, and the patient's demographic profile, support the diagnosis of a posterior lingual Stafne bone defect with atypical radiographic presentation in an edentulous region, rather than a true residual cyst.

CONCLUSION

Based on the clinical and radiographic examinations, the diagnosis favored a Stafne bone defect. Panoramic radiography initially revealed a well-defined radiolucent area with relatively corticated borders in the left posterior mandible, corresponding to the edentulous region of teeth

36–37. This appearance, in a site with a history of periapical infection of tooth 37, led to a preliminary impression of a possible residual cyst in the healed extraction area. To clarify the nature of this finding before definitive prosthetic rehabilitation, a cone-beam computed tomography examination was requested by the Prosthodontics Department. The CBCT scan showed a unilateral, well-defined, ovoid radiolucency in the posterior mandible within the edentulous ridge, measuring approximately 7.3 × 13.7 mm, without evidence of cortical expansion but with thinning and a slight cortical defect on the lingual aspect, even though it was not clearly delineated. Region-of-interest (ROI) analysis (7 × 7 pixels) revealed attenuation values lower than those of the adjacent cortical bone, yet not compatible with a simple fluid-filled cavity, reinforcing the interpretation of a lingual cortical depression (Stafne bone defect) rather than a residual cyst or other intraosseous cystic lesion. In this case, no surgical procedure was performed because the CBCT findings did not indicate a residual cyst, so the lesion was managed by periodic evaluation, and fabrication of a full denture was carried out.

ACKNOWLEDGMENTS

We would like to express our deepest gratitude to all individuals and institutions who contributed to the completion of this case report, “Panoramic Appearance of a Stafne Bone Defect Resembling a Residual Cyst in an Edentulous Mandible.” First, we extend our sincere thanks to the patients whose cases are presented in this report. Their willingness to share their experiences has been invaluable in enhancing our understanding of Stafne bone defects and their clinical implications. We also gratefully acknowledge the support of our colleagues at the Radiology Department of the Dental Hospital, Udayana University, for their assistance in obtaining the radiographic images and clinical data.

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