

Mandibular Bone Defect Imaging Features in Cone Beam Computed Tomography: A Case Report

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Abstract

Mandibular bone defect or Stafne bone defect is usually an incidental finding in imaging examinations due to its lack of symptomatology. It is often observed as a radiolucent lesion with well defined limits. In this report it is demonstrated a case of mandibular bone defect close to the mandible angle, in a 16-year old female, that performed cone beam computed tomography examination in order to verify the proximity of the third inferior molar to the mandibular canal. In this case, it was verified that the defect was continuous to the mandible border and it had a thick sclerotic margin. No treatment is necessary to mandibular bone defects, but regular follow-ups are strongly recommended.

Keywords: Cone beam computed tomography, imaging diagnosis, oral pathology, mandibular bone defect

Introduction

Mandibular bone depression (MBD) or Stafne bone defect was first described by Edward Stafne in 1942 [1]. The researcher reported cases in which a radiolucent well-defined lesion could be observed nearby mandible angle, below the mandibular canal, on the posterior and medial surfaces of the mandible [1]. Stafne postulated that the defect was established during the development and ossification of mandible due to a portion of the salivary gland, mainly the submandibular salivary gland that becomes entrapped in the mandibular bone tissue [1].

Although Stafne's theory is the most known and acceptable for the MBDs, currently many investigators advocated that the defect could also originate from a vascular compression erosion [2,3] or due to incomplete calcification of Meckel cartilage during ossification [2,4]. The content of these defects has been depicted as salivary gland tissue [3,5], muscles, fat or lymphoid tissue, blood vessels and/or connective tissue [2,5].

MBDs have four distinct variants, classified according to the their location in the mandible: the most common, lingual posterior [6,7], close to the mandible angle and usually bellow the third molar [7]; lingual anterior, which is in the region of the sublingual salivary gland, lingual ramus and buccal ramus depression, which is adjacent to the parotid salivary gland region [8,9] and the most infrequent variant of all four variants [10].

Thus, the objective of this report is to describe a case of a lingual posterior MBD, verified as an incidental finding in a cone beam computed tomography (CBCT) examination, in order to share the common imaging findings of this defect with dental practitioners and help in the differential diagnosis.

Case Report

Case history and clinical findings

In May 2018, a female Caucasian patient (16 years old) was referred to CBCT examination in order to verify the relationship between the mandibular canal and the third molar, in order to plan a surgical procedure. The patient was asymptomatic, her medical history was not significant and there were no abnormal findings in the intra and extra-oral examination of the patient.

Imaging evaluations

The CBCT revealed an oval-shaped hypodense area nearby the mandible angle, posteriorly to the third molar, below the mandible canal, with well-defined thick sclerotic borders, as demonstrated in figure 1.

When evaluating the other slices, it was observed that the defect was continuous to the anterior mandible bone, as shown in figure 2.



Figure 1. Cone beam computed tomography of the case, sagittal slice and three-dimensional reconstruction.

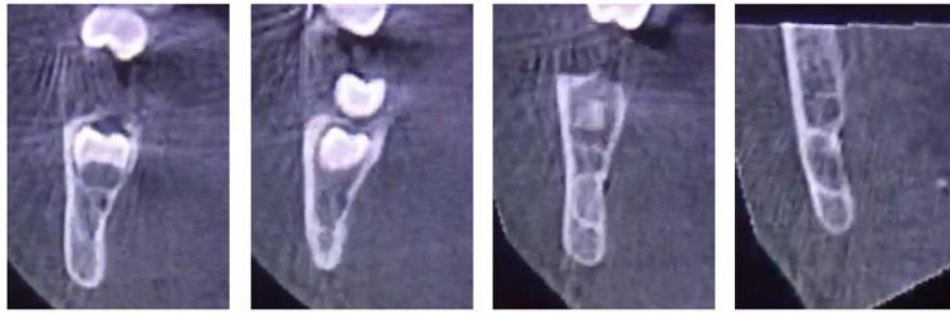


Figure 2. Coronal slices of the case. From the left to the right: note the defect below the third molar; note the defect continuous to the mandible anterior border.

Discussion

A number of distinct denominations has been applied to MBDs, such as cortical mandibular depression, developmental bone cavity, idiopathic bone cavity or developmental bone cavity. In this report it was described a case of posterior lingual MBD found incidentally in a CBCT examination.

MBDs are usually identified incidentally at routine imaging examinations as in the case reported [2,8,11]. Although MBDs imaging features resemble to cystic lesions, MBDs are defined as pseudocysts, due to the absence of epithelial lining. The defects have no symptomatology [2,8,11] and can be rarely palpated, when the vestibular mandible bone surface is absent [12]. Unusual variants, such as ramus or anterior variants, are often a challenge to dental practitioners in diagnosing when identified [10].

The defect affects more frequently male than female patients, and it is detected mostly after 5th to 6th decades [4,10,11]. MBDs can present a number of imaging features, such as thick or absent bone margins, continuity or contiguity with the mandible border, oval or circular shape, unilocular and multilocular, but the defect usually exhibits as a partial radiolucency in panoramic radiographs [7] or a hypointense area as in the case presented.

The first imaging examinations that frequently detect MBDs are panoramic radiographs. On panoramic radiographs, MBDs may present as a total radiolucent or partial radiolucid area, with usually well-defined limit and rarely ill-defined limits [7]. Unilocular aspect of the lesion is more often verified than multilocular. Thick border sclerosis is more frequent than absence of sclerotic border [7].

In computed tomography, it can be observed if the MBD interrupts the border of the mandible. In the present case, it can be verified that the defect is continuity with mandible border, without interrupting it. CBCT can be also useful to determine the depression limits and its relationship with adjacent structures, such as mandibular canal.

In order to verify the content of MBDs, magnetic resonance imaging (MRI) can be performed, as well as sialography. MRI can depict the MBD content according to the signal intensity of the tissue inside the defect [10]. Sialography can show the glandular ducts that composes the salivary gland tissue inside de MBD.

A number of imaging examinations can be performed in order to differ MBDs from other lesions. The differential diagnosis

of MBDs include non-ossifying fibroma, brown tumor of hyperparathyroidism [5,6], aneurysmal bone cyst, salivary gland hypertrophy [13], giant cell tumor, multiple myeloma, eosinophilic granuloma and metastatic disease [5,6], traumatic bone cyst, benign tumors of the salivary gland and lipoma [13].

MBDs do not require any treatment or surgical procedure, but regular follow-ups are recommended.

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