

Lingual accessory mental foramen: a report of an extremely rare anatomical variation

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Abstract: The presence of accessory foramina and canals in the mandible is frequently overlooked in clinical procedures. It is important to note that these anatomical variations may only be pre-surgically detected on imaging exams, and such detection may directly influence therapeutic success. We describe a previously unreported case of accessory mental foramen located in the lingual cortical bone of the mandible. (*J Oral Sci* 52, 501-503, 2010)

Keywords: mental foramen; accessory mental foramen; computed tomography.

Introduction

The mental nerve is a somatic afferent sensory nerve and corresponds to the terminal branch of the mandibular nerve, which is the third division of the trigeminal nerve. In the premolar region, the inferior alveolar nerve, a branch of the mandibular nerve, usually splits into two branches, the mental nerve and the incisive nerve. The incisive nerve runs intra-osseously along with veins and innervates the anterior mandibular teeth (incisors, canines, and premolars) (1). The mental nerve emerges at the mental foramen

(MF) and divides into four branches: angular (innervation of the angle of the mouth region), medial and lateral inferior labial (skin of the lower lip, oral mucosa, and gingiva as far posterior as the second premolar), and mental branch (skin of the mental region) (2).

Radiographically, the MF presents as a single circular or elliptical radiolucent area in the premolar region, bilaterally. The absence of a MF (3) and the presence of multiple MF (4) are rarely reported. The presence of more than one MF, referred to as accessory mental foramina (AMF), has been noted on dissection, surgical findings, conventional radiographs, spiral computed tomography (CT), and cone beam CT.

CT has been established as a valuable imaging modality capable of providing in-depth information about maxillofacial structures, allowing detailed evaluation of their topography and anatomical variations, such as AMF. It is also very helpful in obtaining information about trabecular patterns, alveolar processes, skeletal measurements, and in the surgical planning for jaw deformities or implant insertion. CT is the most accurate imaging modality for the identification and localization of the mandibular foramen, mandibular canal, and MF (5). The localization of such structures, as well as their eventual anatomical variations, is of fundamental importance prior to any surgical and anesthetic procedure. Because the mental nerve supplies the skin of the chin and mucous membrane of the lower lip and gingiva, in surgeries of the anterior region of the mandible, the surgeon should protect this anatomical structure, and particular care should be taken when AMF are present (6).

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The aim of this article is to report a rare case of AMF located in the lingual cortical bone of the mandible.

Case Report

A 47-year-old asymptomatic man underwent CT (Multidetector LightSpeed Pro CT, GE Medical Systems), in preparation for implant therapy. Axial slices of 0.65 mm slice thickness, and 0.65 mm increment were obtained from the mandible, with a bone filter and standard reconstruction. Sagittal and coronal slices (0.3 mm slice thickness each) were reformatted and 3D reconstruction was performed.

We observed the presence of two mandibular canals in the left mandibular ramus (Fig. 1), and both only ascended

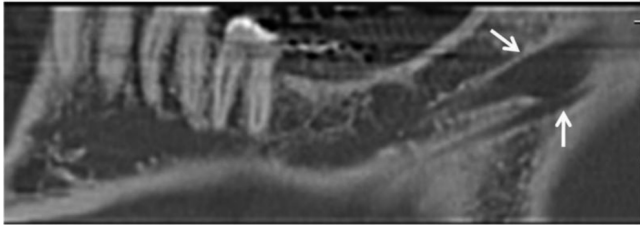


Fig. 1 Sagittal multi-slice CT image showing the presence of two mandibular canals in the left mandibular ramus (white arrows).



Fig. 2 Coronal multi-slice CT image showing the bifurcation of the mandibular canal between the premolars, giving rise to a buccal exit (white arrow) and a smaller and lower lingual exit (black arrow).



Fig. 3 3D bone reconstructions indicating the presence of two mandibular canals (white arrows) and the AMF (white circle), located in the lingual cortical bone.

as far as the lower left second molar. In the left premolar region, bifurcation of the mandibular canal between the premolars was evident, producing a buccal exit (the left mental foramen) and a smaller and lower lingual exit (Figs. 2 and 3). Planning for dental implant placement was performed considering the anatomical variation mentioned, in order to avoid neurovascular bundle damage.

Discussion

Remarkable studies of mandibular accessory foramina and canals are found in the literature. However, most of these studies are from dry mandibles (7) and dissections; clinical (6,8) and radiographic studies (9,10) are performed less frequently. An even smaller proportion of cases are of CT images, particularly from multi-slice CT machines.

The presence of one or more accessory foramina, usually called mental foramina, is among the variations described in the literature. It has been assumed that such variation results from the ramification of the mental nerve before it passes through the MF (9). This was observed in the present case in terms of an intra-osseous bifurcation producing two intra-osseous courses of the mental nerve, associated with the MF and the AMF (Fig. 2). Although the accessory foramen in this case was located in the lingual cortical bone, the term lingual accessory 'mental' foramen still seems appropriate because it refers to the nerve that bifurcates to pass through this anatomical landmark.

It is important to differentiate the AMF from a nutritive foramen. The AMF is defined as a bony foramen originating from the mandibular canal, as observed in this case. Nutritive foramina, on the other hand, do not originate from the mandibular canal and are significantly smaller (10). The size of the AMF reported in the present case suggests that this foramen carried a nerve as well as vessels.

A literature search revealed that AMFs have been reported only in the buccal cortical of the mandible; hence, the present case is first reported of an AMF in the lingual cortical bone.

The presence of accessory foramina and canals in the mandible is frequently overlooked in clinical procedures. It is important to stress that these anatomical variations may only be pre-surgically detected on imaging studies, and such detection may have a direct influence on therapeutic success.

CT produces reliable high-resolution images. Multi-slice CT machines have superior technology to their predecessors and generate images with a slice thickness of 0.65 mm, allowing a good visualization of structures. Additionally, 3D reconstructions may help the identification of AMFs and differentiate them from nutritive foramina. The use of 3D reconstruction in this case confirms and

illustrates the presence of an AMF in the lingual cortical bone of the mandible. We believe it is possible to recognize this anatomical variation through computed images with cone beam technology, especially if a smaller voxel size is used.

In conclusion, it is important to recognize anatomical variations that may influence diagnosis and treatment planning in dentistry. The increasing use of multi-slice CT should help this process. The recognition of AMFs may contribute to adequate anesthetic techniques and help to avoid misdiagnosis of bone lesions and eventual damages to the nerves and vessels during surgical procedures in this region.

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