Letters to the Editor

Fenestration of the mandibular buccal cortex by the inferior alveolar neurovascular bundle

Dear Editor,

It has been observed that the presence of anatomical variations in the mandible is frequently overlooked in clinical management. The aim of this article is to describe two rare clinical cases of fenestration of the mandibular buccal cortex by the inferior alveolar bundle, detected by cone beam computed tomography (CBCT).

The first case was a 58-year-old female patient who was referred to the private clinic for rehabilitation with dental implants. The patient underwent an examination by CBCT (Kodak 9000, Carestream Health, Rochester, NY, USA) to assess the bone quality and quantity for placement of dental implants in the edentulous regions. In cross-sectional slices and in 3D reconstructions of the left mandible (Fig. 1), it was observed that the mandibular canal lacked cover by the buccal cortex.

The second case was a 68-year-old male patient who was referred to the department of oral surgery for placement of dental implants in the posterior regions of the mandible. Preoperative panoramic radiography revealed normal shape, size, and course of the mandibular canals, thus no significant alterations were observed (Fig. 2). The patient underwent an examination by CBCT (Kodak 9000). In this examination fenestrations of the mandibular buccal cortex were observed – bilateral in the retromolar region (Fig. 3).

The presence of anatomical variations associated with the mandibular canal has great clinical implications during surgical procedures such as dental implant placement, orthognathic surgery, lower third molar extraction, and sagittal mandibular osteotomies. Inaccuracy in locating anatomical variations in the mandible can result in injury to the inferior alveolar neurovascular bundle (IANB), such as traumatic neuroma, paresthesia, anaesthesia, and haemorrhage.1,2

In the present cases, it was not possible to determine if the IANB was exposed. Instead, we believed the IANB to be covered by the periosteum and to be safe from all procedures except those including elevation of the periosteum (e.g. extraction of impacted third molars and sagittal split ramus osteotomies) and in cases of orthognathic surgery (metal plates are fixed in the buccal cortex).

A PubMed search was conducted (articles published in the English language literature, Table 1) in order to review case reports of fenestration in the buccal cortex by the inferior neurovascular bundle. Only two cases of fenestration of the mandibular buccal cortex by the IANB have been described, both confirmed by computed tomography (CT).3,4 In those cases, the fenestrations were associated with pathological processes. However, the present cases are the first in the literature showing

Fig. 1. CBCT images of the left mandibular body showing fenestration of the mandibular buccal cortex by the inferior alveolar bundle in 3D reconstruction (A, black arrow) and cross-sectional slices (B, white arrows).
a true absence of mandibular buccal cortex by the IANB without any association with pathological processes.

CBCT is an imaging technology used in several areas of dental medicine, because it allows the 3D evaluation of maxillofacial structures, offering clear structural images with high contrast. Although the exposure dose remains a controversial concern with 3D imaging, it has been shown that a proper selection of exposure parameters and field size may produce relatively low-dose CBCT examinations, especially if compared to CT. In the second case of fenestration, the mandibular cortex was only visualized in the CBCT images, being misdiagnosed by panoramic radiography.

In conclusion, CBCT imaging was fundamental for the diagnosis of fenestrations in the mandibular buccal cortex by the IANB. Knowledge of this anatomical variation is important in the management of surgical procedures, especially in cases of sagittal split ramus osteotomies, third molar extractions, and orthognathic surgery.

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Competing interests
None declared.
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References


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Fig. 1. (A) Computerized 3D scan of the patient showing maxillomandibular fusion on the right and left side. (B) Black arrows show the close proximity of the buccal pad of fat to fusion in an axial computerized tomography scan.