



Contents lists available at ScienceDirect

Annals of Anatomy

journal homepage: www.elsevier.com/locate/aanat



Combined anatomical variations: The mylohyoid bridge, retromolar canal and accessory palatine canals branched from the canalis sinuosus[☆]

M.C. Rusu^{a,*}, M. Săndulescu^b, C. Bichir^a, L.A.S. Muntianu^c

^a Division of Anatomy, Faculty of Dental Medicine, “Carol Davila” University of Medicine and Pharmacy, Bucharest, Romania

^b Division of Oral Implantology, Faculty of Dental Medicine, “Carol Davila” University of Medicine and Pharmacy, Bucharest, Romania

^c Division of Removable Prosthodontics, Faculty of Dental Medicine, “Carol Davila” University of Medicine and Pharmacy, Bucharest, Romania

ARTICLE INFO

Article history:

Received 5 June 2017

Received in revised form 13 July 2017

Accepted 28 July 2017

Available online xxx

Keywords:

Mandible

Spine of Spix

Mandibular lingula

Canalis sinuosus

Mandibular canal

ABSTRACT

The study of anatomical variations is important not only for collecting anthropometric data, but also for improving clinical protocols and understanding why a particular clinical procedure sometimes does not yield the expected results. We report the case of a 74 year-old patient, in which we observed combined anatomical variants of the mandible and maxillary bone. One of these was the unilateral mylohyoid bridge (MB) of the uncommon, lingular type. This MB extended posteriorly to the spine of Spix, over the sulcus colli behind the spine. It thus formed a common mandibular canal (MC) which further divided into a retromolar canal and the MC proper. This combination of variants in the mandible has not, to our knowledge, previously been reported, at least in studies using cone beam computed tomography (CBCT). Additionally we found multiple accessory canals (ACs) deriving from the canalis sinuosus, which opened opposite to each frontal tooth, presumably carrying either dental fibers of the palatine nerves, or palatine fibers of the anterior superior alveolar nerve. Although the ACs in the anterior palate are well established anatomical variants, the MB appears in publications rather as an anthropological identifier. However, when present, it can impede anaesthesia of the lower teeth and thus deserves to be included in anatomical descriptions. The evaluation of patients in CBCT should observe the anatomical features on a case-by-case basis and it also provide data for studies of MB prevalence in large numbers of patients.

© 2017 Elsevier GmbH. All rights reserved.

1. Introduction

The medial surface of the mandibular ramus has a series of surface details relevant to the anesthesia of the inferior alveolar nerve (IAN). The most relevant is the spine of Spix, located anterior superior and medial to the mandibular foramen and anterior to *sulcus colli* (mandibular sulcus) which, in turn, guides the inferior alveolar neurovascular bundle towards the mandibular foramen and canal (Khoury et al., 2011). Above the spine of Spix, the temporal crest and the inner crest of the mandibular neck converge to form a crest of thickened bone (Khoury et al., 2011) which is referred to as the torus of Weissbrem. For the IAN block in the pterygomandibular space, the needle tip must reach the proximity of the IAN to ensure an anesthetic effect (Takasugi et al., 2000). Patient-related anatom-

ical factors may contribute to anesthetic failure (Boronat Lopez and Penarrocha Diago, 2006).

The mylohyoid bridge (MB) was described by Ossenberg as an anomalous derivative of Meckel's cartilage in 1974 (Ossenberg, 1974b); in that article the author quoted a personal study on 3500 specimens (Ossenberg, 1974a) which was published in the same year and reported that the frequency of the MB differs with respect to several variables, which lead to the interpretation that the MB is an inherited anomaly of the class of epigenetic skeletal variants. The frequency of the MB was indicated between 1 and 60% (Ossenberg, 1974b) and the precursor of the MB was considered as the distal continuation of the sphenomandibular ligament (Ossenberg, 1974b). Two morphological variants of the MB were indicated, a proximal lingular type, uncommon, which extends posteriorly the mandibular lingula (spine of Spix), and a distal one (bridge type), inferior to the mandibular foramen, bridging the mylohyoid groove (Ossenberg, 1974b), completely (uncommon) or incompletely (Narayana et al., 2007). Double MBs have also been documented (Corruccini, 1974). Different studies,

[☆] This paper belongs to the special issue Dentomaxillary.

* Corresponding author at: University of Medicine and Pharmacy “Carol Davila” 8, Bd. Eroilor Sanitari, RO-76241 Bucharest, Romania.

E-mail address: anatomon@gmail.com (M.C. Rusu).

mostly anthropological, have evaluated the MB in various populations (Corruccini, 1972, 1974; Crevecoeur et al., 2009; Dodo, 1974; Hanihara and Ishida, 2001; Hanihara et al., 1998; Hosapatna et al., 2015; Jidoi et al., 2000; Kaul and Pathak, 1984; Lundy, 1980; Manjunath, 2003; Nikolova et al., 2017; Saiki et al., 2000; Sawyer et al., 1978; Sawyer et al., 1990; Sawyer and Kiely, 1987; Turan-Ozdemir and Sendemir, 2006; Walker et al., 2010).

The canalis sinuosus (CS) of Jones (1939) carries the anterior superior alveolar nerve (ASAN) which is distributed mainly in the frontal (anterior) maxillary teeth. It was found that in slightly more than 50% of patients accessory canals (ACs) branch off the CS and end in the anterior palate, on the palatine side of frontal maxillary teeth (Machado et al., 2016; Neves et al., 2012; Torres et al., 2015). Other authors have reported the anastomosis of the ASAN and the greater palatine nerve located in such an AC of CS, demonstrating a distribution of the ASAN to the palatine mucosa (Valcu et al., 2011).

Although MBs were repeatedly documented on dry mandibles, to our knowledge there has been no cone beam computed tomography (CBCT) study of this non-metrical variant in human adult patients. In the present paper we document such a case, consequently demonstrating that the MB can be evaluated by CBCT in patients and must be considered in basic and clinical anatomy teaching, beyond its anthropological value.

2. Case report

A 74 year-old male patient was explored in CBCT for dental treatment. The subject was scanned using a CBCT machine – iCat (Imaging Sciences International) at the following settings: resolution 0.250, field of view 130, image matrix size 640 × 640. The patient was positioned according to the manufacturer's instructions. CBCT data was analyzed using the iCatVision software and the application 3DVR v5.0.0.3, for the 3D renderizations, the specific protocol being previously described (Rusu et al., 2013). We used bidimensional multiplanar reconstructions (MPRs) in the axial, coronal, sagittal or oblique planes, and three-dimensional volume renderizations (3DVRs) with variable filters and bone subtraction. The patient gave written informed consent for all medical data (including radiographs, CBCT scans and intraoral images) to be used for research and teaching purposes, provided the protection of the identity is maintained.

While exploring the mandibular rami we found several anatomic variations. Each mandibular ramus presented a fossa on its inner surface, immediately beneath the anterior half of the mandibular notch, which determined a reduced thickness of the mandible ramus, 0.5–2.0 mm as measured on axial MPRs. As that fossa was located on the inner side of the coronoid process base, it was termed coronoid fossa. Although it was bilateral, the right coronoid fossa was thinner and presented minute perforations. The limits of each coronoid fossa were: anterior – the temporal crest, superior – the mandibular notch, and posterior – a second crest which was descending from the mandibular notch to converge with the temporal crest at a torus (crest of thickened bone) located above the spine of Spix (mandibular lingula). This second crest differs from and in addition to the inner crest of the mandibular neck. The torus/crest of thickened bone was bilaterally symmetrical and posterior to it, on each side, there was a vertical groove (*sulcus colli*) leading to the mandibular foramen.

On the left side (Figs. 1, 3 and 4) a short spine of Spix was accurately conformed and located anterior, superior and medial to the left mandibular foramen. The left mylohyoid groove was interrupted in its middle segment by a distal mylohyoid bridge (partial mylohyoid bridging). That bridge transformed the mylohyoid groove into a mylohyoid canal which opened inferiorly into a mylohyoid foramen. The left mandibular canal had, at its entrance,



Fig. 1. Successive (anterior-to-posterior) coronal MPRs through the mandible rami. 1. Sphenoidal sinus; 2. lateral pterygoid lamina; 3. zygomatic arch; 4. right mandibular ramus; 5. left mandibular foramen; 6. left spine of Spix (lingula mandibulae); 7. right mandibular foramen; 8. mylohyoid bridge; 9. mylohyoid canal.

a 3.45/4.37 mm opening and, at the inferior end of its mandibular ramus segment, a size of 2.61/4.19 mm.

On the right side (Figs. 1–4), a proximal (lingular) mylohyoid bridge was observed, which presented as a posterior complete extension of the spine of Spix to the inner crest of the mandibular neck; this determined a higher position of the mandibular foramen on that side and an initial segment of the resulting canal, located between the mylohyoid bridge and the *sulcus colli* on that side. Due to the presence of that mylohyoid bridge the spine of Spix was not evident on that side. Also, the proximal segment of the mylohyoid groove was absent, being transformed in mylohyoid canal by the inferior extension of that bridge. The right mandibular canal had at the entrance, modified by the mylohyoid bridge, a 4.47/7.49 mm opening and, at the inferior end of its mandibular ramus segment, a 2.46/4.12 mm inner size. These differences were due to an additional, retromolar canal of 2.12/2.15 mm, which was found within the right mandibular ramus. This determined the following morphology of the canals: the horizontally placed mandibular foramen lead into a common mandibular canal, further divided into a retromolar canal and a mandibular proper one, the former being of comparable size with the opposite one. The retromolar canal had an initial segment directed anteriorly, and further dichotomized into ascending and descending branches. The ascending branch was opened in the retromolar fossa between the temporal crest and the anterior border of the mandibular ramus, at a retromolar foramen, from which a retromolar groove continued superiorly. The descending branch of the retromolar canal was thinner and continued within the retromolar alveolar bone.

The intrinsic canals in the left anterior maxilla could not be adequately documented, as the patient had three endosseous implants modifying the anatomical features. On the right side we observed three successive ACs deriving from the CS, corresponding to each frontal tooth (Fig. 5).

Download English Version:

<https://daneshyari.com/en/article/8460405>

Download Persian Version:

<https://daneshyari.com/article/8460405>

[Daneshyari.com](https://daneshyari.com)