



# Mylohyoid foramen of mandible: a rare exit point of intra-mandibular origin of nerve to mylohyoid

Satheesha B. Nayak<sup>1</sup>, K.V. Soumya<sup>2</sup>

<sup>1</sup>Melaka Manipal Medical College (Manipal Campus), Manipal University, Manipal, <sup>2</sup>Department of Mathematics, Manipal Institute of Technology, Manipal Academy of Higher Education, Manipal, India

**Abstract:** Nerve to mylohyoid is a branch of inferior alveolar nerve. It arises in the infratemporal fossa and runs in the mylohyoid groove of mandible to reach the submandibular region, where it supplies the anterior belly of digastric and mylohyoid muscles. Though sensory distribution of this nerve have been described, it is predominantly a motor nerve. Here, a rare intra-mandibular origin of nerve to mylohyoid has been presented. This nerve arose from the inferior alveolar nerve inside the mandible and came out to the submandibular region by passing through a small foramen present on the medial surface of the body of the mandible. It ended by supplying the anterior belly of digastric and mylohyoid muscles. The knowledge of this variation could be of importance to maxillofacial surgeons and radiologists.

**Key words:** Nerve to mylohyoid, Inferior alveolar nerve, Mandibular nerve, Foramen, Variation

Received August 22, 2019; Revised September 3, 2019; Accepted September 6, 2019

## Introduction


Nerve to mylohyoid is a small branch from the inferior alveolar nerve, which in turn is a branch from the posterior division of the mandibular nerve. All the motor fibers of the posterior division pass through the nerve to mylohyoid and are distributed to anterior belly of digastric and mylohyoid muscles. Nerve to mylohyoid takes origin from the inferior alveolar nerve just before the latter enters the mandible through the mandibular foramen. It pierces the sphenomandibular ligament and runs on medial side of the mandible, in relation to the mylohyoid groove. Nerve to mylohyoid seldom shows variations. Very few variations have been reported such as its

origin from mandibular nerve, from ligular nerve, some abnormal communications with other nerves, etc. There are no published reports on intra-mandibular origin of this nerve. This report describes intra-mandibular origin of nerve to mylohyoid and its exit from a unique mylohyoid foramen.

## Case Report

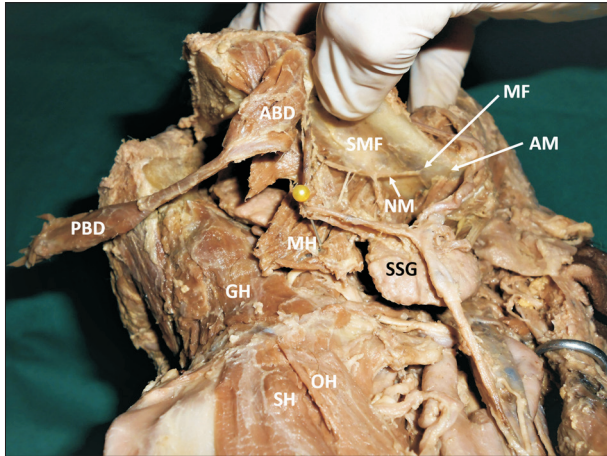
During routine dissection classes for undergraduate medical students, a rare variation in the course of the nerve to mylohyoid was noted in a male cadaver aged about eighty years. This variation was found in the left side of the body and was unilateral. During the dissection of the infratemporal fossa, it was noted that the inferior alveolar nerve did not give the nerve to mylohyoid before entering the mandibular foramen. Later, during the dissection of submandibular region, nerve to mylohyoid was observed to emerge out from a small foramen situated in the posterior end of the submandibular fossa, just medial to the angle of the mandible (Figs. 1, 2). The nerve to mylohyoid took arose from the inferior alveolar nerve, within

### Corresponding author:

K. V. Soumya   
Department of Mathematics, Manipal Institute of Technology, Manipal Academy of Higher Education, Madhav Nagar, Manipal. Karnataka State 576104, India  
Tel: +91-9844265023, E-mail: soumya.kv@manipal.edu

Copyright © 2020. Anatomy & Cell Biology

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

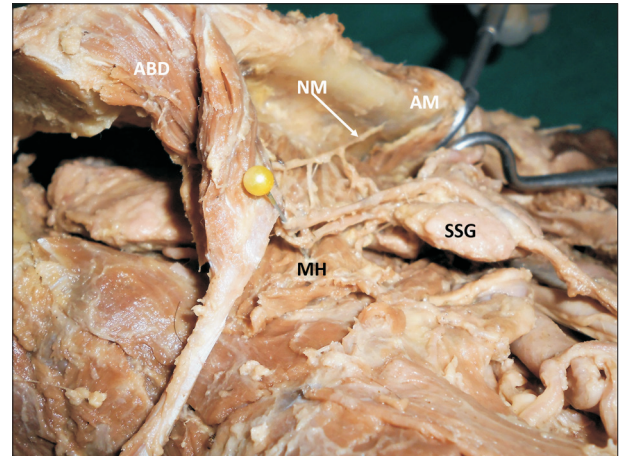


**Fig. 1.** A dissection of the left submandibular region showing the exit of nerve to mylohyoid from the mylohyoid foramen of mandible. The mandible has been cut at the symphysis menti and the left half of the mandible has been lifted up. ABD, anterior belly of digastric muscle; AM, angle of mandible; GH, geniohyoid muscle; MF, mylohyoid foramen; MH, mylohyoid muscle; NM, nerve to mylohyoid; OH, omohyoid muscle; PBD, posterior belly of digastric muscle; SH, sternohyoid muscle; SMF, submandibular fossa; SSG, submandibular salivary gland.

the mandibular canal and emerged out through this unique foramen. Further course and distribution of the nerve was normal. It supplied the mylohyoid muscle and the anterior belly of digastric as described in the textbooks of anatomy.

## Discussion

Mylohyoid nerve is known to show variations in its origin. It might directly arise from the mandibular nerve [1] or from the lingual nerve [2]. Previous studies have reported that it could contain sensory fibers that supply mandibular teeth [3]. In rare cases, nerve to mylohyoid presents abnormal communications with other nerves. Gandhi et al. (2018) [4], have reported a case wherein, the nerve communicated with the lingual nerve in the submandibular region, close to the submandibular ganglion. Another reported variation of nerve to mylohyoid is its entrapment in the lateral pterygoid muscle [5]. Mandible presents only mandibular and mental foramina. A study shows some accessory foramina on the ramus near the mental foramen [6]. There are no reports on a mylohyoid foramen as seen in the current case. In the literature so far, there is only one case about the passage of the nerve to mylohyoid through the mandible [7]. But in that case, the nerve arose from two roots; one from the trunk of mandibular nerve and the other from the inferior alveolar nerve. This was seen in



**Fig. 2.** A closer view of the dissection of the left submandibular region showing the exit of nerve to mylohyoid from the mylohyoid foramen of mandible. ABD, anterior belly of digastric muscle; AM, angle of mandible; MH, mylohyoid muscle; NM, nerve to mylohyoid; SSG, submandibular salivary gland.

the infratemporal fossa. Later both inferior alveolar nerve and nerve to mylohyoid entered the mandibular canal together. In the current case, the nerve to mylohyoid arose inside the mandible. In the previous reported case, the nerve to mylohyoid came out of the mandible at a distance of 24.3 mm from mandibular foramen. But in the current case it came out from the mandible at a distance of 30 mm from the mandibular foramen. The possible cause for the intra-mandibular course of nerve to mylohyoid could be related to its embryological development. During development of the mandibular nerve and the mandibular arch, the fibers of nerve to mylohyoid could have got trapped in the mesenchyme of the first arch, thus getting an unusual intra-mandibular course. One of the leading causes of inferior alveolar nerve block is found to be the variation of the nerve to mylohyoid. This usually happens when the nerve to mylohyoid contains sensory fibers and arises from inferior alveolar nerve much higher than usual case. Bennett and Townsend (2001) [8] have found small foramina on the mandible through which branches of nerve to mylohyoid entered the mandible to supply mandibular tooth. A study by Clark et al. (1999) [9] revealed sensory supply to lower lip by fibers of nerve to mylohyoid in 100% of the cases studied. They also reported that chances of sensory supply by nerve to mylohyoid to anterior teeth are more compared to the posterior teeth. Wilson et al. (1984) [10] also found foramina in the mandible beyond mylohyoid muscle through which the nerve to mylohyoid supplied incisor teeth. Keeping in view the variations of the nerve to mylohyoid, they recom-

mend a Gow-Gates type of injection technique rather than a conventional mandibular block [10].

In a recent review, Choi et al. [11] opine that it is crucial to note the variation of nerve to mylohyoid during implant placement, removal, and screw placement and to harvest a graft.

There is only one case report about the intra-mandibular course of nerve to mylohyoid. The variation being reported in the current case is unique compared to the previous case with respect to the origin of the nerve. Intra-mandibular course of this nerve might likely contain sensory fibers from mandible or its teeth. Intra-mandibular course of the nerve to mylohyoid predisposes it to damage in fractures of mandible. This case could be of interest to craniofacial surgeons and radiologists.

## ORCID

Satheesha B. Nayak: <http://orcid.org/0000-0003-1421-8222>  
K.V. Soumya: <http://orcid.org/0000-0001-5907-5443>

## Author Contributions

Conceptualization: SBN. Data acquisition: SBN. Data analysis or interpretation: SBN. Drafting of the manuscript: SBN, KVS. Critical revision of the manuscript: KVS. Approval of the final version of the manuscript: all authors.

## Conflicts of Interest

No potential conflict of interest relevant to this article was reported.

## References

1. Kumar S, Kumar CJ, Bhat S, Kumar A. Anatomical study of the unusual origin of a nerve to the mylohyoid muscle and its clinical relevance. *Br J Oral Maxillofac Surg* 2011;49:e14-5.
2. Jablonski NG, Cheng CM, Cheng LC, Cheung HM. Unusual origins of the buccal and mylohyoid nerves. *Oral Surg Oral Med Oral Pathol* 1985;60:487-8.
3. Sillanpää M, Vuori V, Lehtinen R. The mylohyoid nerve and mandibular anesthesia. *Int J Oral Maxillofac Surg* 1988;17:206-7.
4. Gandhi S, Mehta V, Suri RK. Unusual array of neural communications in the infratemporal fossa: useful for skull base surgery. *Morphologie* 2018;102:302-5.
5. Loughner BA, Larkin LH, Mahan PE. Nerve entrapment in the lateral pterygoid muscle. *Oral Surg Oral Med Oral Pathol* 1990; 69:299-306.
6. Iwanaga J, Nakamura Y, Abe Y, Kikuta S, Iwamoto O, Kusukawa J. Multiple accessory foramina of the mandibular ramus: risk factor for oral surgery. *Surg Radiol Anat* 2016;38:877-80.
7. Kılıç C, Kamburoğlu K, Özen T. A mylohyoid nerve traveling within the mandibular canal: a case report. *Balkan Med J* 2010; 27:297-9.
8. Bennett S, Townsend G. Distribution of the mylohyoid nerve: anatomical variability and clinical implications. *Aust Endod J* 2001;27:109-11.
9. Clark S, Reader A, Beck M, Meyers WJ. Anesthetic efficacy of the mylohyoid nerve block and combination inferior alveolar nerve block/mylohyoid nerve block. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1999;87:557-63.
10. Wilson S, Johns P, Fuller PM. The inferior alveolar and mylohyoid nerves: an anatomic study and relationship to local anesthesia of the anterior mandibular teeth. *J Am Dent Assoc* 1984;108: 350-2.
11. Choi P, Iwanaga J, Dupont G, Oskouian RJ, Tubbs RS. Clinical anatomy of the nerve to the mylohyoid. *Anat Cell Biol* 2019;52: 12-6.