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Case Report

A RARE CASE OF ACCESSORY NERVE TO MYLOHYOID COMMUNUCATING WITH LINGUAL NERVE AND ITS CLINICAL IMPLICATIONS

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ABSTRACT

Nerve to mylohyoid is a branch of inferior alveolar nerve given just before it enters the mandibular foramen. It courses inferior to the origin of mylohyoid and supplies both mylohyoid and anterior belly of digastric along its superficial surface. An accessory branch from inferior alveolar nerve was discovered during routine dissection. The nerve was found only on the left side. Additionally, a communicating branch was seen between lingual nerve and accesoory nerve to mylohyoid. Knowledge of the variations of the mandibular nerve, its branches and communications are clinically important especially for attaining adequate local anaesthesia during routine oral and dental procedures.

KEY WORDS: Inferior alveolar nerve, Nerve to Mylohyoid, Lingual nerve, Communicating Branch.

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INTRODUCTION

Mylohyoid is a triangular, flat muscle that forms the floor of mouth. It is attached to the entire mylohyoid line and meets the other fellow in a midline fibrous raphe that extends from symphysis menti to hyoid bone. The inferior surface is covered by platysma, and anterior belly of digastric is closely related to it [1]. Mylohyoid serves functions like chewing, swallowing, respiration and phonation. Both mylohyoid and anterior belly of digastric muscles are supplied by the nerve to mylohyoid that emerges from inferior alveolar nerve before entering mandibular foramen [2]. It is considered to be a motor nerve but studies have shown it to have sensory fibres, through a cutaneous branch to chin and the lower incisor teeth [3].

The sensory innervation to the teeth and some soft tissues on the ipsilateral side of the mandible are supplied by inferior alveolar nerve through the dental plexus. The nerve enters the mandible by passing through the mandibular foramen, positioned on the medial surface of the angle of the mandible. While performing an inferior alveolar nerve block (also known as mandibular block), the clinicians deposit the anaesthetic solution in this region [4].

LN is one of three branches from posterior division of mandibular nerve. Other branches are auriculotemporal nerve and inferior alveolar

nerve. The nerve to the mylohyoid muscle (or nervus mylohyoideus), primarily a motor nerve is given off from the inferior alveolar nerve before it enters the mandibular foramen. The inferior alveolar nerve divides again on the anterior aspect of the mandible into two branches. The mental nerve, which egresses out of the the jaw by passing through the mental foramina supplies part of the buccal mucosa, lip and chin area of the face. Incisive nerve, which is the other branch of the inferior alveolar nerve advances within the mandible and provides sensory stimulation to the anterior teeth and their associated gingivae [4].

MHN is the cause of many cases of anaesthetic failure. Transaction of the soft tissue pedicle attached to the mental spine and inferior border of the symphysis during genioplasties leads to damage of the sensory and the motor branches of the mylohyoid nerve. Here we report a case where an additional mylohyoid nerve stemmed out of inferior alveolar nerve before it entered the mandibular foramen. It is imperative for surgeons to pay attention to such anomalous branching patterns during dissection and osteotomy of the chin in order to avoid complications to the mylohyoid nerve and its branches [5].

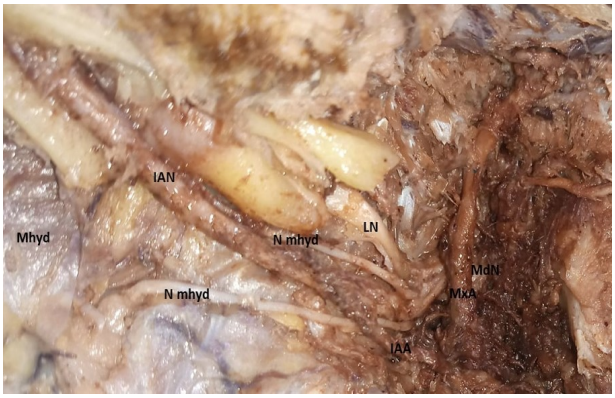
In addition, there was communication between accessory nerve to mylohyoid and lingual nerve. Few case studies have been reported revealing anomalous communications between branches of the posterior division of the mandibular nerve [6,7,8]. Such communication involving accessory nerve to mylohyoid and lingual nerve has never been reported in anatomical and surgical literature to the best of our knowledge.

These anatomical variations are important clinically in pathological conditions, such as treatment failure of trigeminal neuralgia, which commonly involves the mandibular nerve. Such communications may lead to failure of local nerve block or accidental surgical injuries. Knowledge of atypical communications involving these nerves is a key factor in the management of lesions in the infratemporal fossa [8]. There is dearth of literature regarding variations in the course of the MHN in relation to the mandible [3,9.] This information has practical value for oral and maxillofacial surgeons as one of the major complications of a number of oral and maxillofacial surgery procedures is the injury of the LN. The lingual nerve may get compromised during third molar extraction, periodontal procedures, management of mandibular fractures and removal of metastatic lesions due to its anatomic location .[3,10.] LN might also get damaged during local anaesthesia and suturing. [3,11.]

CASE REPORT

During routine dissection of the infratemporal region in the Department of Anatomy a unilateral accessory nerve to mylohyoid on the left side was discovered in a 60 year old male cadaver. The mandibular nerve and its branches were carefully dissected after removing the ramus of the mandible. Inferior alveolar nerve and artery were seen entering the mandibular canal. Just before mandibular foramen, it gave a medial and a lateral branch. On further exploration, the branch on the medial side supplied the mylohoid along its superior surface and the branch on lateral side supplied mylohyoid along its inferior aspect coursing close to the angle of mandible. In addition to it, the lingual nerve provided a thin communicating branch to the medial nerve to mylohyoid. On the right side, no such variant pattern was observed.(Fig 1)

Fig. 1: Mhyd-mylohyoid; IAN- Inferior Alveolar Nerve; N mhyd-Nerve to mylohyoid; LN-Lingual nerve; IAA-Inf. Alveolar artery; MxA-Maxillary Artery; MdN-mandibular nerve.



DISCUSSION

Microdissection studies based on diameter of neurons constituting the MHN shows dual role of the nerve [2,12].

The results of one study indicated the presence

of both motor and sensory neurons [2].

Because of this additional branch as seen in this case, a conventional inferior alveolar block may be ineffective in achieving mandibular anesthesia. Wilson and colleagues found that the MHN branched an average of 14.7 millimeters from the entry of the inferior alveolar nerve into the mandibular canal [13]. In a standard mandibular nerve block, this span could be remote from the range of dissipation of anesthetic solution. Therefore, the supplementary nervous supply can go on transmitting pain signals. In another study 16 of 37 cadavers (43%)indicated detectable extension of branches of MHN into mandibular foramina.[13]. An accompanying branch of MHN was detected in 13 of 26 cadavers in a study conducted by Madeira et al. [14].

Mandibular teeth may be supplied by an additional innervation by the MHN as demonstrated by the above mentioned literature. This could be one of the causes for dental pain during surgery post mandibular block which dentists need to evaluate [4].

Standard text books do not routinely mention a communicating branch between MHN and LN. In a study by Kim et al, a communicating branch between MHN and LN was found in 12.5% of 32 heads and they also elaborated that this communication could provide another passage for conjunctive sensory transmission. This also acts as a possible cause of incomplete anaesthesia during dental practice [3]. Although our findings resemble with the case reported by the previous authors [15]. We did not observe any unusual thickness of the MHN in this case. LN is more susceptible to injury due to its close relationship with third molar during extraction procedures [10]. The extraction of third molar teeth or an removal of the submandibular salivary gland may result in damage of MHN [15-17] It has been found that such cases where a communication is found between MHN and LN, MHN invariably gives sensory fibres to tongue. Therefore, tongue sensation might get affected by an injury involving proximal portion of MHN without involving LN [15].

Due to contributory role of MHN to nerve supply of tongue,this type of connection would also aid in revival of LN function as suggested by Reinhart; Chossegros et al., Joshi and Rood [15] Such type of unusual communication between MHN and LN may lead to unexpected presentations [18].

A connecting branch between MHN and LN is embryological in origin and it is believed to carry from mylohyoid muscle through lingual nerve [19]. This communicating branch, if present, might be involved in the coordination of tongue movements with suprahyoid muscles via proprioceptive impulses [6]. The most convincing explanation for such communication is likely the hitchhiking of fibres during the developmental process [20].

Aberrant nerve communications are not uncommon, and knowledge regarding the functional perspectives of such communicating branches is absolutely necessary in order to effectively perform surgical procedures in any part of the human body. Functional integrity of structures supplied by posterior division of mandibular nerve may be retained due to additional pathway provided by such communicating nerves [6].

CONCLUSION

During genioplasties, resection of the soft tissue pedicle annexed to the mental spine can damage sensory and the motor branches of the MHN . Hence it is imperative that surgeons are aware of variations in MHN and its branches to avoid complications during osteotomy of chin and dissection procedures.

Post oral and submandibular surgeries, this communication between MHN and LN can lead to unexpected findings. Therefore, the present case would be of considerable significance to the surgeons and to dental practitioners for averting avoidable complications during radical neck dissection and oral surgeries.

ABBREVIATIONS

LN - Lingual Nerve

MHN - Nerve to mylohyoid.

Conflicts of Interests: None

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