Case Report

Abnormal Communications of the Inferior Alveolar Nerve with Anterior Division of the Mandibular Nerve and the Lingual Nerve – A Case Report

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Abstract

Anomalous communications between the branches of posterior division of mandibular nerve are extensively reported due to their implication in various treatment procedures undertaken in the infratemporal region. We report an abnormal communication (CM1) between the anterior division of the mandibular nerve and the inferior alveolar nerve (IAN). The communicating branch was sufficiently thick and arose from the anterior division of mandibular nerve, traversed through the inferior head of lateral pterygoid muscle (LHLP) and united with the IAN on its lateral aspect, just at the mandibular foramen. Further there was a communication (CM2) between the IAN and the lingual nerve (LN). The communicating branch traversed downwards and forwards obliquely from the IAN before joining the LN. This communication was found deep to the LHLP. Knowledge of the current variation is important in two ways. Firstly, the CM1 might get compressed or pulled during the action of the LHLP as it passed through it; Secondly, Spix technique of IAN block might fail to give the desired effect as the CM1 joined IAN very close to the mandibular foramen.

Keywords: Inferior alveolar nerve, lingual nerve, communication, mandibular nerve

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Introduction

Inferior alveolar nerve (IAN) is one among the three branches of the posterior division of the mandibular nerve. It supplies the lower jaw and teeth. Its mylohyoid branch supplies the mylohyoid muscle and anterior belly of digastric muscle (1). Studies in the past have reported the incidence of communication of IAN with other nerves. Two different studies have reported the communication between lingual and IAN in 7% and 25% of cases (2,3).Unusual branches of IAN (4) and its unusual relationship with the maxillary artery (5) have also been reported. We report here, a unique variation of the IAN and we believe that such a variation has not been reported earlier.

Case Report

During our dissection classes for undergraduate medical students, we observed two abnormal communications of the inferior alveolar nerve (IAN). The first communication (CM1) was between the anterior division of the mandibular nerve and the IAN. This communicating branch was sufficiently thick (half the size of IAN) and it arose from the anterior division of mandibular nerve, just below the foramen ovale. It passed through the lower head of lateral pterygoid muscle (LHLP) and joined the IAN on its lateral aspect, just at the mandibular foramen (Fig. 1 and 2). The second communication (CM2) was between the IAN and the lingual nerve (LN) (Fig. 1

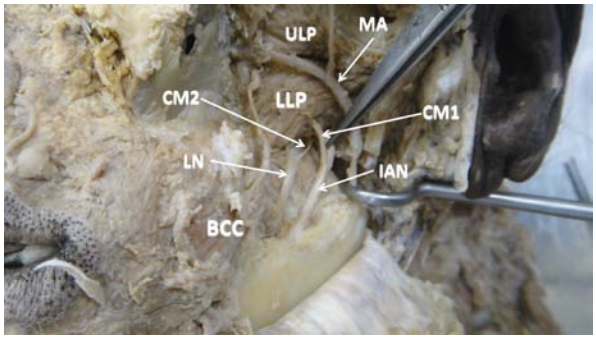

Figure 1: Dissection of the left infratemporal fossa showing the communications of the inferior alveolar nerve. (BCC – buccinator; CM1, communication between inferior alveolar and anterior division of the mandibular nerves through the lower head of the lateral pterygoid; CM2, communication between the lingual and inferior alveolar nerves; IAN, inferior alveolar nerve; LLP, lower head of lateral pterygoid; LN, lingual nerve; MA, maxillary artery; ULP, upper head of lateral pterygoid)

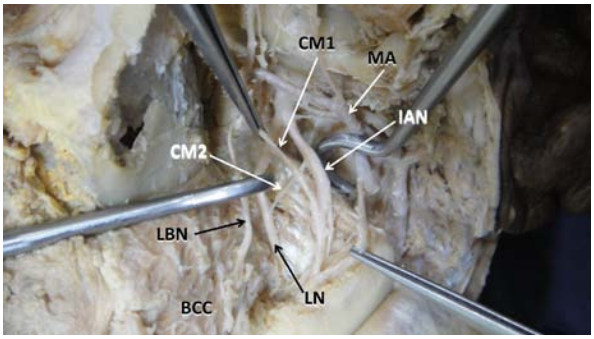

Figure 2: Closer view of the communications of the inferior alveolar nerve after removal of the lateral pterygoid muscle.(BCC – buccinator; CM1, communication between inferior alveolar and anterior division of the mandibular nerves through the lower head of the lateral pterygoid; CM2, communication between the lingual and inferior alveolar nerves; IAN, inferior alveolar nerve; LBN, long buccal nerve; LN, lingual nerve; MA, maxillary artery)

and 2). The communicating branch ran downwards and forwards obliquely from the IAN before joining the LN. This communication was found deep to the LHLP.

Discussion

Knowledge of position, course and communications of IAN and its possible branches is important for effective local anaesthesia. It is also important for dental, oncological and reconstructive surgeries (6). Communication between the IAN and LN is a frequently reported variation and it might be responsible for inadequate mandibular anaesthesia (3). Origin of the inferior alveolar nerve through three roots; one from mandibular, one from auriculotemporal and one from LN has been reported (7). Embryologically, the mandibular nerve and its branches are derived from the neural crest cells in the cephalic region (8). The cells of the neural crest migrate ventrally through the mesoderm of the mandibular arch with the help of multiple cell matrix interactions. Any inhibition of neural crest cells from normal migration is believed to be the reason for having abnormal branches of the mandibular nerve. Compression of the IAN or its abnormal branches or communications by any other structures such as vessels and muscles may lead to mandibular or trigeminal neuralgia (9) resulting in altered sensitivity of the mandibular gingival mucosa (10).

A case similar to the present one, has not been reported yet. The communication between anterior division of mandibular nerve and IAN through a thick communicating branch is of immense clinical importance. Since this branch communicated with the IAN very close to the mandibular foramen, the lower teeth and gingiva might not get properly anesthetised if the communicating branch is not infused with sufficient amount of anaesthetics. Since, this branch passed through the lateral pterygoid muscle, it might lead to numbness or altered sensation at the areas supplied by the inferior alveolar nerve. The maxillofacial surgeons should be aware of this abnormal communication through the lateral pterygoid to avoid injury to the nerve during any surgical procedures in the infratemporal region.

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