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CASE REPORT

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A rare variation of the inferior alveolar artery with potential clinical consequences

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Variations of the inferior alveolar artery are seemingly quite rare, especially with regard to its origin from the maxillary artery. We present an unusual case of an inferior alveolar artery that originated from the external carotid artery. To the best of our knowledge, our case is one of only two reports of the inferior alveolar artery arising from the external carotid artery. The clinician who deals with the mandibular region should be aware of such a variation in the arterial architecture.

Key words: maxillary, external carotid, mandible

INTRODUCTION

The maxillary artery arises posterior to the neck of the mandible as the larger terminal branch of the external carotid artery. Along its course the artery gives off branches to various structures such as the external acoustic meatus, the middle ear, the muscles of mastication, the skull, the dura mater, and the structures within the infratemporal and pterygopalatine fossae. One of the more important branches of this artery is the inferior alveolar artery descending with its corresponding vein and nerve and forming a neurovascular bundle that supplies the teeth of the mandible, gingivae, and the skin over the chin and lower lip [2]. Just prior to entering the mandibular foramen the inferior alveolar artery supplies a horizontal branch to the cheek [8]. The inferior alveolar neurovascular bundle is of importance in view of the many invasive procedures performed in this region. We present an unusual case of an inferior alveolar artery that originated from the external carotid artery. Variation in the inferior alveolar artery is, apparently, rare. To the best of our knowledge, our case is one of only two reported cases of the inferior alveolar artery arising from the external carotid artery.

CASE REPORT

After detaching the coronoid process and removing the ramus of the left mandible in a 63-year-old male cadaver we discovered that the inferior alveolar artery originated from the external carotid artery 3.5 cm inferior to its terminal bifurcation into the maxillary and superficial temporal arteries (Figs. 1, 2). This vessel was found to course anteriorly deep to the ramus of the mandible and superficially to the lateral pterygoid muscle. This vessel then travelled inferiorly for approximately 4.5 cm and entered the mandibular foramen. The inferior alveolar nerve entered the mandibular foramen in a normal fashion (Figs. 1, 2).

DISCUSSION

Knowledge of the maxillary artery and its branches in the infratemporal fossa is of great importance in dental, oral, and maxillofacial surgery. The main branches of the maxillary artery within the infratemporal fossa are the middle meningeal, deep temporal, masseteric and inferior alveolar arteries. Although the maxillary artery is variable in regard to its course, the origin of its branches is

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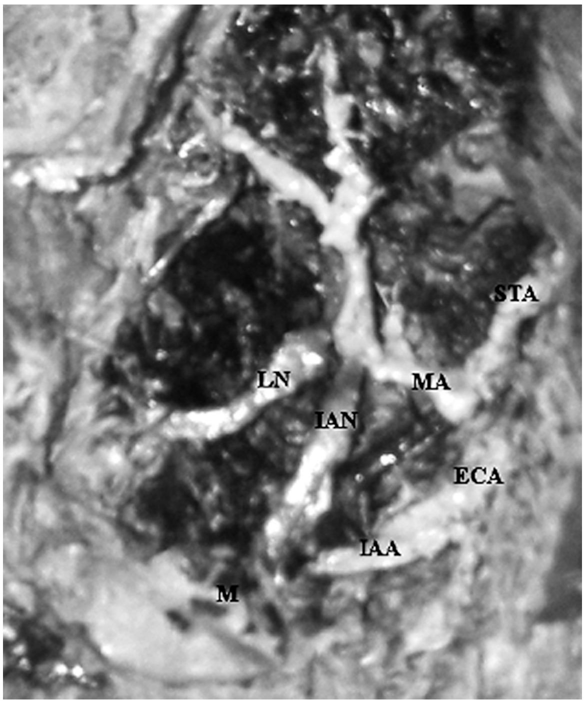

Figure 1. Photograph of the infratemporal fossa demonstrating the inferior alveolar artery (IAA) originating from the external carotid artery (ECA). LN — lingual nerve; IAN — inferior alveolar nerve; MA — maxillary artery; STA — superficial temporal artery; M — mandible.

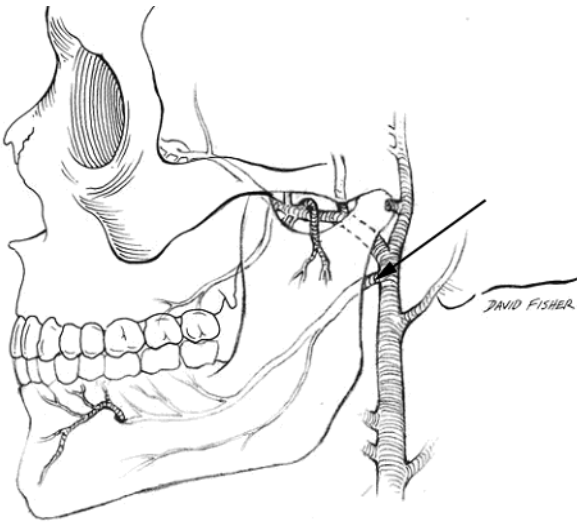

Figure 2. Schematic drawing (below) of the variation found in our specimen. Note the origin of the inferior alveolar artery (arrow) from the external carotid artery.

usually constant [1]. The masseteric artery has been reported to originate from the external carotid artery [10]. Jergenson et al. [7] in an abstract have reported a case in which the inferior alveolar artery originated from the external carotid artery, as seen in our case.

The inferior alveolar nerve is the largest branch of the mandibular nerve and descends with the inferior alveolar artery. Blocks of the inferior alveolar nerve are one of the most common injections performed during dental procedures to achieve mandibular anaesthesia [4]. A potential hazard of this procedure is vascular trauma [6]. Arterial penetration during mandibular blocks is reported in up to 20% of cases [3]. Any variation of the inferior alveolar artery may predispose a patient to increased morbidity during inferior alveolar nerve block. Moreover, variation in the origin of the inferior alveolar artery may alter the course and plan of surgical procedures that remove the mandible or parotid gland. Invasive procedures of the infratemporal fossa may also be complicated by such an anomaly. This vessel appears to be more variable in the mandibular canal than prior to this point [9].

Interestingly, Hamparian [5], in a study of the blood supply to the human foetal mandible, found a plexus of arteries supplying the coronoid process and lateral wall of the ramus of the mandible derived from the facial, masseteric, transverse facial and external carotid arteries.

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