Internal maxillary artery

The maxillary artery, also known as the internal maxillary artery is one of two terminal (end) branches of the external carotid artery in the neck. It has 17 branches, broken into three sections (portion 1,2, and 3), which supply an array of muscles, structures, and passageways in and around the face and ear. The maxillary artery supplies deep structures of the face. It branches from the external carotid artery just deep to the neck of the mandible.

The maxillary artery, the larger of the two terminal branches of the external carotid artery, arises behind the neck of the mandible, and is at first imbedded in the substance of the parotid gland; it passes forward between the ramus of the mandible and the sphenomandibular ligament, and then runs, either superficial or deep to the lateral pterygoid muscle, to the pterygopalatine fossa.

It supplies the deep structures of the face, and may be divided into mandibular, pterygoid, and pterygopalatine portions.

The first or mandibular portion passes horizontally forward, between the neck of the mandible and the sphenomandibular ligament, where it lies parallel to and a little below the auriculotemporal nerve; it crosses the inferior alveolar nerve, and runs along the lower border of the lateral pterygoid muscle.

Branches include:

Deep auricular artery

Anterior tympanic artery

Middle meningeal artery

Inferior alveolar artery which gives off its mylohyoid branch just prior to entering the mandibular foramen

Accessory meningeal artery

Internal maxillary artery (IMax) to middle cerebral artery(MCA) bypass has been recently described as an alternative to cervical EC-IC bypass. This technique utilizes a “key hole” craniectomy in the temporal fossa that requires a technically challenging end-to-side anastomosis.

is safe and efficacious. The lateral temporal fossa craniectomy technique resulted in reiable identification and wide exposure of the IMax, facilitating the proximal anastomosis [1)].

The challenge of locating and isolating the internal maxillary artery (IMA) hinders its potential use as an arterial donor for extracranial-to-intracranial bypass surgery.

Ten specimens were prepared for surgical simulation. After the pterional craniotomy, a 2-step drilling technique was performed (lateral triangle). First, a triangular craniectomy was completed anterolateral to the foramen spinosum. By following the middle meningeal artery and dividing the lateral pterygoid muscle, the proximal part of IMA was located. Second, a bone slot was drilled in a posterior-to-anterior direction from the anterior aspect of the first craniectomy. By tracing of the proximal part, the main trunk of the IMA was obtained. The size of the 2 craniectomies, the depth of IMA from the surface of the middle fossa, and the length of exposed IMA were measured.

Drilling within the lateral triangle allowed safe exposure of both the trunk and the branches of the mandibular nerve of the IMA. The total craniectomy measured 27.8 ± 4.2 mm in the anterior-posterior direction, and the posterior portion measured 13.3 ± 1.5 mm in the lateral-medial direction. The depth from the middle fossa to the IMA (16.8 ± 3.2 mm, mean ± SD) was equal to the length of IMA exposed (17.6 ± 3.3 mm, mean ± SD; $P > .05$).

This new approach provides an efficient and safe method to consistently find and isolate a segment of the IMA suitable for extracranial-to-intracranial bypass [2].

see Internal maxillary artery to middle cerebral artery bypass.

Anatomic dissections were performed on 6 cadaveric specimens to assess the location of the internal maxillary artery (IMAX) using an extradural middle fossa approach. Subsequently, the procedure was implemented in a patient with a giant fusiform internal carotid artery aneurysm.

A straight line was drawn anteriorly from the V2/V3 apex along the inferior edge of V2. The IMAX was found 8.6 mm on average anteriorly from the lateral edge of the foramen rotundum. Abdulrauf et al., drilled to a depth of 4.2 mm on average to find the medial extent of the artery and then lateral and deep drilling exposed an average of 7.8 mm of graft. The IMAX was consistently found running just anterior and parallel to a line between the foramens rotundum and ovale. In the clinical case presented, both intraoperative indocyanine green and postoperative conventional angiography revealed a patent graft. The patient did well clinically without any new deficits.

The advantages of this new technique include the avoidance of a long cervical incision and potentially higher patency rates secondary to shorter graft length than currently practiced [3].

1)
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2)
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3)
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