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Research Article

BRANCHING PATTERN OF ANTERIOR BRANCH OF MIDDLE MENINGEAL ARTERY

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ABSTRACT

Middle meningeal artery (MMA) is a branch of maxillary artery. It enters the cranial cavity through foramen spinosum. It runs vertically upwards about 2cm and divides into anterior (Frontal) & posterior (parietal) branches. The frontal branch runs towards the Pterion and then proceeds midway between nasion &inion. 70 vault of the skull were studied. In present study we observed the anterior branch followed the normal course in 52 (37%) sides. It is divided into two branches in 42 sides (30%) of the vault. Divided into three branches in 7 sides (5%) & multiple branches in 25 sides (17.8%). There were two anterior branches on 14 sides (10%) of the vault. The anterior branch is approachable to the Pterion and it is an emergency procedure to save a life of an individual by stopping the extra dural bleed which can take place only in 37% of the cases where as it is not possible in rest of the cases.

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INTRODUCTION

Middle meningeal artery (MMA) which is a branch of maxillary artery ascends between sphenomandibular ligament and lateral pterygoid, passes in between two roots of the auriculotemporal nerve and leaves the infratemporal fossa through the foramen spinosum to enter the cranial cavity medial to the midpoint of the zygomatic bone. It runs in an anterolateral groove on the squamous part of the temporal bone, dividing into frontal and parietal branches. The larger frontal (anterior) branch runs towards the Pterion and then proceeds midway between nasion &inion.

The Pterion is also an important landmark for the anterior branch of the middle meningeal artery, Broca's area (44-45), the insula, and the stem of the lateral sulcus. It is also a primary site during surgery to gain access to the sphenoid ridge and optic canal (Saxena et al, 2003).

Aim of the Study

To study the branching pattern of anterior branch of middle meningeal artery.

MATERIALS AND METHODS

70 vault of the skull collected from Shri Sathya Sai Medical College & Research Institute, Kilpauk Medical College, Chennai, Sree Balaji Medical College, Chrompet, Chennai & SV Medical College, Tirupati were studied.

Observations

The vascular margin caused by the anterior branch of middle meningeal artery is observed on both the sides. The pattern was not identical on both the sides and presented lot of variations.

1. The normal pattern was observed in 52 sides (37%) - (Fig 1,1a)
2. Divided in to two branches in 42 sides (30%) - (Fig 2,2a).
3. Divided into three branches in 7 sides (5%) - (Fig 3,3a)
4. Divided into multiple branches in 25 sides (17.8%) - (Fig 4,4a)
5. There were two anterior branches on 14 sides (10%) - (Fig 5,5a)



Fig 1

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Fig 1a

Fig 1, 1a Showing Normal pattern of anterior branch of middle meningeal artery



Fig 3a

Fig 3, 3a Anterior branch of middle meningeal artery divided in to three branches



Fig 2



Fig 4



Fig 2a

Fig 2, 2a Anterior branch of middle meningeal artery divided in to two branches



Fig 4a

Fig 4, 4a Anterior branch of middle meningeal artery divided in to multiple branches



Fig 3



Fig 5



Fig 5a

Fig 5, 5a Middle meningeal artery gave two anterior branches

DISCUSSION

The middle meningeal artery (MMA) may be torn in temporal fracture or trauma, resulting in separation of duramater from the bone leading to extra dural hemorrhage (Lama *et al*, 2000; Moore, 1985; Williams *et al*, 1998). Consequently the Pterion is important in operations reducing an extradural haematoma as well as inferior tumors of frontal lobe and operations on Broca's motor speech area on the left side. In addition the Pterion is an important landmark in operations on the optic nerve using the "pterional approach" (Bage *et al*, 2002; Heros *et al*, 1993; Potapov *et al*, 1996; Yu C *et al*, 1999). A one centimeter circle centered on the midpoint of the pterion overlapped the anterior branch of the MMA in 68% of skulls (Siyan Ma *et al*, 2011). This region overlaps the anterior branch of the MMA in two-thirds of cases. In the present observation Pterion overlapped anterior branch of MMA in 37% only

Inference

In accidents the common artery which is the cause for extradural hemorrhage is anterior branch of middle meningeal artery (MMA). The patient becomes unconscious, and then recovers once again to go into unconsciousness. This is known as Lucid Interval which is very characteristic of middle meningeal artery (MMA) being injured causing extradural hemorrhage.

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To save the life of the individual where nearby hospital services are not available with whatever instrument available the bone at the Pterion can be nibbled and middle meningeal artery bleed can be stopped by putting nearby tissue on the vessel. If the branching pattern is not normal and is presenting variations one may not be able to arrest the bleeding. So knowledge about the possible variations of the middle meningeal artery (MMA) becomes essential.

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