Incidental Traumatic Pseudoaneurysm of the Middle Meningeal Artery: Case Report and Literature Review

ABSTRACT

Traumatic pseudoaneurysms of the middle meningeal artery is rare and is associated with high mortality. Skull fracture is usually an associated feature of this entity. An elderly male was brought to our hospital in a stage of coma. The details of ictus were not known. The Glasgow coma scale score was 9/15. Examination revealed a pseudo-aneurysm arising from the posterior branch of the left middle meningeal artery which was excised. The case is presented for its rarity and its characteristic radiology. Traumatic pseudoaneurysm of middle meningeal artery is rare. It is important to recognize this treatable entity.

KEYWORDS: Skull fracture, Extradural hematoma, Pseudoaneurysm, Middle meningeal artery

INTRODUCTION

Traumatic pseudoaneurysms of the middle meningeal artery are rare lesions accounting for less than 1% of all intracranial aneurysms (2). The aneurysms are usually associated with skull fracture (3). The overall mortality is 20% (3) and the usual presentation is extradural hematoma but subdural, subarachnoid and intra cerebral hematomas are also known (1).

CASE REPORT

Presentation

A 50-year-old male was brought to he Accident and Emergency department of our hospital in a state of stupor. The details of ictus were not known. Physical examination revealed abrasions on forehead. The Glasgow coma scale score was 9/15. There was no lateralizing sign.

Imaging

CT scan of the head revealed multiple brain contusions especially of the temporal lobes with diffuse brain edema.

There was a lot of cisternal blood in the right side of the chiasmatic cistern (Figure 1). A suspicion of aneurysmal rupture with loss of consciousness, subsequent fall and injury to the head was made. MR angiography of the intracranial vessels was performed and revealed a 2x2 cm aneurysm arising from the posterior branch of the left middle meningeal artery (Figure 2). Skull radiograph lateral view showed a linear non-depressed fracture running across the groove from the posterior branch of the middle meningeal artery (Figure 3).

Operation

A temporal craniotomy was performed. There was no extradural hematoma. The termination of the posterior branch of middle meningeal artery was dilated to form a 2x2cm false aneurysm. The aneurysm was excised in toto and the feeding vessel was cauterized. There was no extension of the aneurysmal sac intradurally.

Post-operative period

The patient was managed conservatively for contusion and...
diffuse brain edema. The patient made a good post operative recovery and is on follow up.

**Histopathology**

Histopathology of the lesion was consistent with pseudoaneurysm (Figure 4).

**DISCUSSION**

True saccular aneurysms of the middle meningeal artery are rare and are seen in Paget’s disease, dural AVMs, Moyamoya disease and meningiomas (10). The first case of traumatic pseudoaneurysm of the middle meningeal artery was reported by Schulze in 1957 (15). About 85% of traumatic pseudoaneurysms are found in the temporal region (4). A fracture line is found in 92% of these cases (6,7). The aneurysm may be located in the weakest part of vessel wall and not necessarily beneath the fracture line. Traumatic pseudo aneurysms usually show an absent true neck, irregular wall, peripheral location and delayed filling and emptying(6). Freckman et al. found middle meningeal artery aneurysms in
4% and AV fistula of middle meningeal artery in 1.8% after reviewing 892 middle meningeal arteries in 446 cerebral angiograms in head injury patients (5). The interval between trauma and pseudoaneurysm rupture ranges from 1 day to 1 year (3,14,17). Various treatment options are available, ranging from craniotomy and excision (9,17), embolization (8,13) to conservative management (12,16,18,19).

The natural history of these lesions is not well known as external carotid angiography is not performed routinely for head injuries. The possible pathogenesis is that the initial tear in the intima is sealed off by a clot, and in time progresses to form a false aneurysm. The pseudoaneurysm can rupture and give rise to extradural, subdural, and subarachnoid or intra parenchymal bleeds (1). In our patient, the CT angiogram was done 48 hours after the trauma. A small tear in the intima at the time of injury could have been there which subsequently was sealed off by the clot. Intraoperatively, we could see the terminal pseudoaneurysmal dilatation of the middle meningeal artery which was covered by a clot.

To date, most of the cases of traumatic pseudoaneurysm of middle meningeal artery that have been reported were asymptomatic because of the secondary effects of this lesion; however our case is unusual as we found the traumatic pseudoaneurysm of middle meningeal artery incidentally while we were looking for either an aneurysm from the internal carotid artery or middle cerebral artery. Our patient was totally asymptomatic for this lesion. There are only two reported cases (14, 16) of incidental asymptomatic traumatic pseudoaneurysm of the middle meningeal artery; our case being the third. In view of the high risk of rupture and high associated mortality, we decided to operate and excise the aneurysm, although there are four case reports of pseudoaneurysms in English literature that have been conservatively managed and where repeat angiograms have revealed complete thrombosis and obliteration of the lesions (12,16,18,19).

CONCLUSION

Traumatic pseudoaneurysm of the middle meningeal artery is rare and an incidental asymptomatic lesion is even more rare. Treatment is mandatory in view of the high mortality associated with the secondary effects of this entity.

REFERENCES