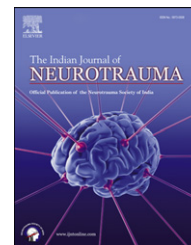


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Case report

Traumatic pseudoaneurysm of the superficial temporal artery: A case report and review of literature

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ARTICLE INFO

Article history:

Received 10 February 2012

Accepted 14 April 2012

Available online 19 April 2012

Keywords:

Superficial temporal artery

Pseudoaneurysm

Traumatic

ABSTRACT

Traumatic pseudoaneurysm of the superficial temporal artery is a very rare lesion and usually presents as a painless pulsatile mass in the temporal region a few weeks after trauma. Though first described by Bartholin in 1740, the infrequent incidence and sometimes perplexing presentation still warrants the need for awareness of its presentation and diagnosis. We report a case of traumatic pseudoaneurysm of the superficial temporal artery that presented a few weeks after blunt trauma to the head. We also review the anatomical peculiarities and pathophysiology that facilitates pseudoaneurysm formation and the optimal approach to diagnosis and management of the lesion.

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1. Case report

A 19 year old male was admitted in S.M.S hospital as a referred patient after a road traffic accident leading to blunt trauma to the head. The resultant 'L' shaped lacerated wound over left temporal region had been sutured at a local clinic. At the time of admission patient was conscious and had no neurological deficits, CT brain was normal and patient was managed conservatively and discharged.

The same patient presented to us three weeks later with a painless pulsatile mass in left temporal region anterosuperior to the tragus [Fig. 1]. On physical examination pulsatile mass of about 20 × 15 mm was seen, it was easily compressible on digital pressure. Proximal compression of left temporal artery eliminated the pulsations of the mass. There was no neurological deficit. CT brain was normal. Three dimensional CT angiography was performed and revealed a 10 × 09 mm size pseudoaneurysm arising from left superficial temporal artery [Fig. 2].

Under general anesthesia surgical exploration by left temporal skin flap elevation done which revealed pseudoaneurysm arising from left superficial temporal artery [Fig. 3]. Resection of the pseudoaneurysm and ligation of proximal and distal end of superficial temporal artery was done. Biopsy sent for histopathological examination confirmed pseudoaneurysm showing hematoma in arterial wall beneath thinned out adventitia and myxomatous changes in tunica media of vessel [Fig. 4]. The patient recovered uneventfully after surgery.

2. Discussion

Aneurysms are classified as true, false or dissecting. Most are designated as true while pseudoaneurysms account for less than 1% of total. Pseudoaneurysms of the superficial temporal artery [STA] are rare and were first described in 1740 and since then more than 400 cases have been reported in literature.¹

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doi:10.1016/j.ijnt.2012.04.008

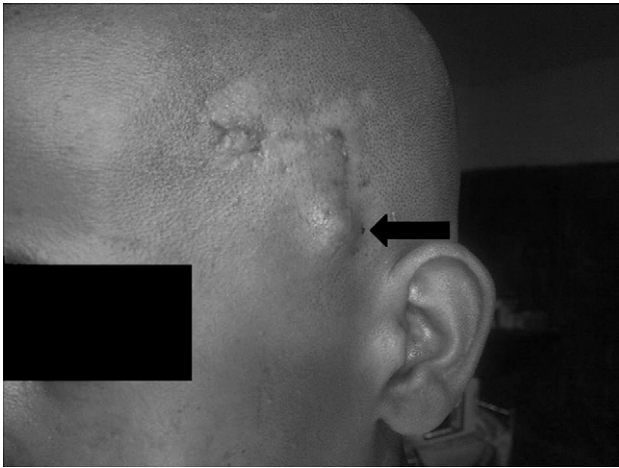


Fig. 1 – Patient at time of presentation with L shaped scar and globular swelling [arrow] anterosuperior to the left tragus.

Most cases [about 75%] are the result of blunt head injury but there also cases reported relating to penetrating scalp lesions, previous craniotomy site, external ventricular drainage,² use of Gardner traction devices³ and hair implants. Spontaneous pseudoaneurysm formation uncommonly occurs as a result of congenital defect or atherosclerotic disease.⁴

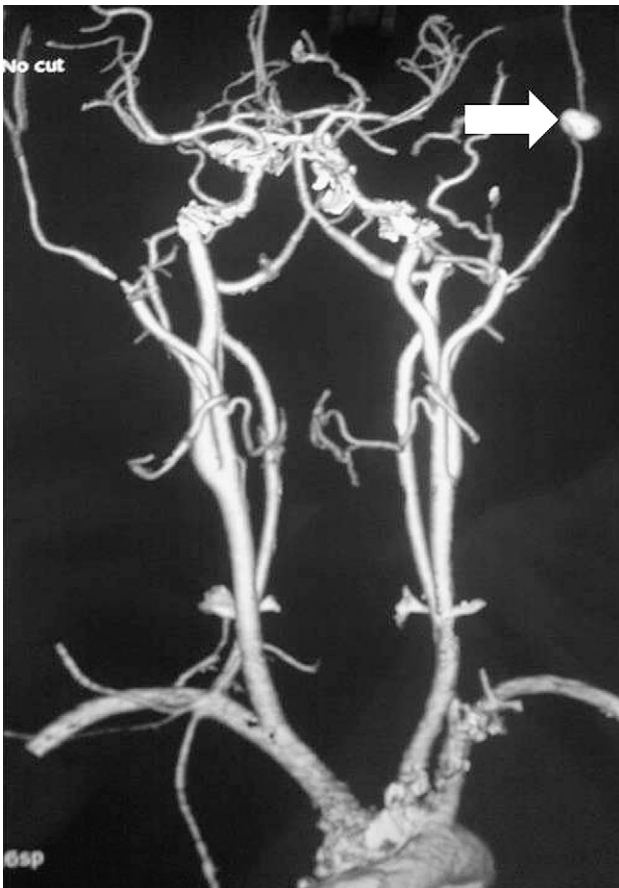


Fig. 2 – 3D CT angio showing pseudoaneurysm of left superficial temporal artery.

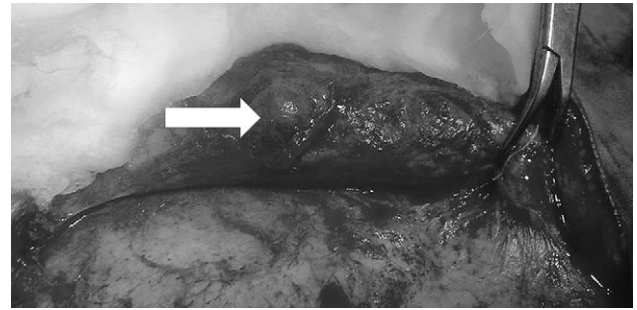


Fig. 3 – Intra operative photograph showing pseudoaneurysm raised with temporal flap.

The external carotid artery splits to form three anterior, three posterior and two terminal branches. The terminal branches [superficial temporal and maxillary] and one of the anterior branches [facial artery] are the vessels most susceptible to injury.¹ Although protected from trauma by surrounding soft tissue, the branches of superficial temporal artery [STA] lie directly on the periosteum at the superior temporal line due to a gap in the muscle and are vulnerable to trauma. The artery is also tethered by adventitia to the frontal and temporalis muscle. These anatomic peculiarities increase the likelihood of a lesion developing in case of blunt trauma.² Pseudoaneurysms develop as a result of complete or partial disruption of arterial intima, possibly due to trauma induced necrosis of a section of the arterial wall.^{1,5} Blood extravasates from the injured artery with formation of a hematoma and a pseudocapsule around it. The hematoma capsule then expands and the clot reabsorbs resulting in a cavity leading to pseudoaneurysm formation.

Patient typically presents with a compressible pulsatile non tender mass which follows trauma to temporal region by 2–6 weeks, although the time window ranges from just a few hours to as long as 10 years. It may be associated with a throbbing headache, ear pain or uncommonly facial nerve palsy.^{6,7} The pulsatile nature of the mass can be reduced with compression of the proximal STA.^{6,8} A systolic murmur and palpable thrill may also be present.

A number of differential diagnosis warrant consideration such as lipoma, hematoma, AV fistula, meningocele, encephalocele, angiofibroma, and chronic middle meningeal



Fig. 4 – Resected specimen.

artery aneurysms with overlying temporal bone erosion^{6,7,9,10} but the peculiar examination findings make pseudoaneurysms stand apart and can be diagnosed by history and through clinical examination.

Skull X-rays can be used in evaluating fracture induced pseudoaneurysm⁴ but they are poorly sensitive. Echo doppler may reveal a waveform flow and high peripheral resistance which would eliminate consideration of AV fistula.⁴ Contrast CT or MRI may reveal extracranial mass and intracranial pathology^{1,4,5,11} but both are not diagnostic.

Arteriography is the diagnostic tool of choice, CT angiography can be used to confirm the diagnosis and exclude other condition such as AV malformation and fistula.

STA pseudoaneurysms require treatment to reduce the risk of hemorrhage from trauma, to relieve headache and for the cosmetic defect.

Conservative management is not recommended,⁴ surgical ligation and resection of the lesion is considered the treatment of choice¹² especially when there is evidence of infection like penetrating trauma.

General anesthesia may be needed for safe access during surgical excision of STA pseudoaneurysm if it is located close to the facial nerve or parotid glands.¹³ Sometimes end to end anastomosis or arterial grafting becomes necessary to restore blood flow to critical dependent structures. Embolization or endovascular intervention has become increasingly popular mode of treating vascular abnormalities. Successful obliteration of STA aneurysms using thrombin has been reported^{14,15} and may prove to be a promising approach to treat vascular abnormalities.^{1,4}

3. Conclusion

Though rare, neurosurgeons should consider the possibility of traumatic pseudoaneurysm in case of a palpable pulsatile mass around periauricular region and confirm their diagnosis by 3D CT angiography because this diagnostic tool can accurately depict the morphology of the pseudoaneurysm. Surgical resection and ligation of proximal and distal ends of the STA is the preferred treatment option.

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