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The pulsatile head mass, 'uncommon things are sometimes common'. A case series

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ABSTRACT

INTRODUCTION: Superficial temporal artery aneurysms account for less than 1% of all reported aneurysms. It is often the result of mild blunt trauma to the side of the head and patients present several weeks later with a pulsatile head mass.
PRESENTATION OF CASE: We report two cases referred to surgery in a 3 month period, from the same GP, of patients which this condition. The first case is a 21 year old carpenter who sustained blunt trauma during a rugby match to the side of the head. He presented several weeks later with headache and an otherwise painless pulsatile mass. The second case refers to a 20 year old male who received blunt trauma to the side of head from an assault. He was referred to his GP due family observing a painless pulsatile mass to the scalp.
DISCUSSION: These cases highlight the relatively little force required to cause this pathological process. Management of this condition is by surgical excision. Simple examination techniques to obliterate the pulse locally can reveal the diagnosis. Subsequent literature search allowed discussion of the management of this rare but important differential diagnosis of a pulsatile head mass.
CONCLUSION: Although rare, STA represents a complication of low energy trauma that requires elective surgical management.

1. Introduction

The incidence of superficial temporal artery aneurysms is reported as less than 1%. Delayed presentation of a pulsatile mass found on examination after blunt trauma to the frontotemporal region of the scalp is highly suggestive of a superficial temporal artery aneurysm, (STA). Literature reports an average presentation time of 2–6 weeks^{-1} posttraumatic incident. Few reports have quantified the innocuous force required to injure the STA along its course, as seen in our two cases. Previous literature has focused on high velocity trauma, such as bicycle accidents [1]. We report two cases of a pulsatile head mass due to low velocity force that was believed to be superficial temporal artery aneurysm and a modified treatment protocol [2].

2. Presentation of cases

2.1. Case 1

A previously fit and healthy twenty one year old carpenter received a blow to the left side of the head during a rugby match. At the time of injury there was no loss of consciousness or superficial injury to the scalp. The patient judged the incident to be insignificant and other than a mildly tender area to the left temporal region he had no other symptoms.

Three months post injury the patient noted a small left temple swelling. Due to its rapid presentation over a short he sort medical advice. He had no visual disturbance or headaches. The mass was noted to increase in size following exercise or when the patient was feeling hot.

The patient had no medical history particularly of vascular or connective tissue disorders.

Examination found a smooth, mobile pulsatile mass of two centimetres in diameter. It was aligned in the course of the temporal artery just within the hairline of the left.

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2.2. Case 2

A twenty-year-old male presented to his general practitioner after receiving a blunt force strike to the left temple region during an assault. Over a period of six weeks he noted the development of a soft swelling to the side of the head in the region of his original injury. He complained of no pain and was unconcerned with the cosmetic appearance. Nevertheless despite his own lack of concerns he was referred by the GP due to the large size of the pulsatile mass.

Surgical exploration revealed a walled of haematoma pseudoaneurysm.

3. Discussion

Reported in 1740 by Bartholin, <1% of all aneurysms, they predominantly afflict young males who have received blunt trauma [4–7]. Travis et al. dissected fractured cadaveric human temporal bones with mean impact velocity of 18–25 mph and force, of 1875 lb required to fracture [8]. Our case findings correlate this trend with a history of much lower energy.

Traumatic aneurysms of the superficial temporal artery are classically false 'pseudo' aneurysms, Our Case series is unique as we report one classic pseudoaneurysm and one true aneurysm. Despite the differences, surgical management is the same.

The origin and lie of the superficial temporal artery, STA, makes it susceptible to shear forces and crushing against the bony origin of the temporalis fascia. This is most often associated with blunt trauma. The artery originates from the external carotid artery at the inferior pole of the parotid gland. The greatest susceptibility is where it transverses the attachment of temporalis fascia to the superior temporal line. The anterior branch of the superficial temporal artery appears to have the highest incidence of injury as it transverses the bone.

Haematoma formation from microvascular injury encourages fibrosis through inappropriate collagen realignment. An early complication of this can be complete vessel occlusion. Subsequent luminal thrombosis and lysis allows recanalization. The pulsatile appearance then erupts due to dilation of the surrounding original haematoma secondary to recanalization. The fibrous scarring surrounding the vessel can be substantial indication the level of cellular deposition of collagen fibres.

Diagnosis is largely based on patient history of a recent episode of blunt or penetrating trauma to the head. Patients present late to their medical practitioner, 2–6 weeks, due to the prolonged time for the described cellular changes to take place. Patients often report an incidental, but associated, headache. Despite this feature they may firstly deny an painful symptoms with the injury itself.

Examination of the mass in detail is particularly crucial in this pathology noting size, consistency, and adherence to underlying structures. The presentation is of a non-fluctuant, painless, solitary, expansive mass in the temporal and parietal region of the skull. We uniquely report two patients who sustained skull injury with no overlying skin injury however their may be signs of superficial abraisons. A key test in the examination is to palpate the mass with concurrent occlusion of the temporal artery proximal to its origin. This should obliterate the pulse within the mass, therefore providing a positive finding suggestive of the diagnosis.

There are a variety of suggested imaging modalities for STA aneurysm mapping [2,3,13]. In the acute setting angiography is recommended along with multi detector 3D CT [3]. However the risks associated with angiogram must be carefully considered particularly in small un complex acute STA's. In the sub-acute or chronic setting Doppler ultrasound is an adequate planning tool for intervention..

The conservative management of STA revolves around use of compression, with our without US Doppler probe to visualise the aneurysm. Conservative compression brings with it risks of thromboembolism and reoccurrence. It should be reserved for pseudoanuerysms of small sizes, with an overlying large haematomas with unclear orifices.

Interventional management can be broadly divided into surgical and non surgical options [9–12]. Percutaneous thrombin injection can circumvent the risk of surgery to hault the aneurysm by forcing intraluminal clot formation. This option should be reserved for psuedoaneurysms where cosmetic outcome is an important factor. However once again there are risks of thromboembolism and distal clot to the vascular tree. Proximal aneurysms in the superficial temporal artery should be avoided with thrombin injections. Endovascular embolization or coiling should be reserved for deep branches of the STA that are difficult to approach. Particular attention should be apid to the risks of embolizing connecting vessels resulting in ischaemic stroke or seizure.

Operative management is the definitive treatment, particularly for true aneurysms. This involves a local or general anaesthetic with Doppler ultrasound localisation of the afferent and efferent vessels. Vessels are surgically tied and ligated, along with any connecting vessels if the aneurysmal sac continues to pulsate on intraoperative examination. The sac is then dissected and excised and the wound closed. In proximal STA aneurysms exposure of the parotid and facial nerve is often required to prevent inadvertent injury. Kim et al. in South Korea reported a simple treatment protocol for

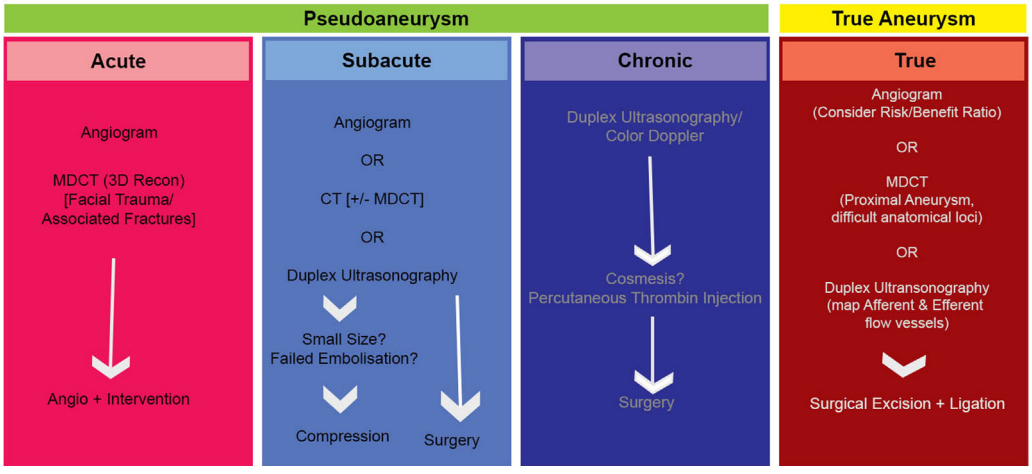

Fig. 1. Treatment algorithm for superficial temporal artery aneurysms, both pseudo and true.

pseudoaneurysms only of the STA in the acute, sub acute and chronic setting. Our protocol modifies this including evidence from more recent experience and includes true aneurysms (Fig. 1).

Hence we report two cases reported incidentally by the same general practitioner and treated successfully with surgical excision and ligation. STA remains a classic surgical pathology that requires careful history and examination over modern technology to provide the correct diagnosis

4. Conclusion

STA represents a rare condition. We report a 2 novel cases of very low energy trauma resulting in STA. It reaffirms the mantra that thorough clinical history and examination is key. In this pathology simple examination techniques as well as a clear timeline within the history shed light on the eventual diagnosis. Although surgical management is indicated patients can be brought in electively for the best results.

Conflicts of interest

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Consent

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Author contributions

RS – Edited final submission.
OS – Edited Final submission.
ME – Operating Surgeon and reviewed final submission.

Guarantor

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