

Case Report

Superficial temporal artery pseudoaneurysm presenting as a growing, pulsatile, and tender mass

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Abstract

Background: Superficial temporal artery (STA) pseudoaneurysms have been reported in the literature since the mid of seventeenth century from Bartholin, however, there is an increasing number of cases, suggesting a diversity of etiological factors. Among these, traumatic events, even of an iatrogenic nature, have been identified as causative factors for nonspontaneous STA pseudoaneurysms. Regional pain and tenderness, troublesome pulsations of the mass, cosmetic concerns as well as the risk of bleeding warrant a thorough evaluation and a definite interventional approach to the condition.

Case Description: A 21-year-old Caucasian male searched medical advice for a growing, tender, and pulsatile mass on his right temple, with isolated and short episodes of lancinating sensations, after sustaining a blunt trauma following a hit with a stick half a year before the admission. Enhanced cranial computed tomography and angiography confirmed the diagnosis of an STA pseudoaneurysm. A direct percutaneous aspiration, as well as ultrasonography, was performed prior to the neurosurgical intervention, with the complete removal of the mass.

Conclusions: STA pseudoaneurysms require a careful evaluation and a conclusive approach in order to avoid the risk of a growing mass and other nonremote complications such as bone erosions and bleeding. Different treatment options are available, including endovascular obliteration and embolization, however, surgical removal after ligation of the afferent and efferent segments of the vessel seem to be highly effective.

Key Words: Blunt trauma, embolization, needle aspiration, superficial temporal artery pseudoaneurysm, surgical removal

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INTRODUCTION

Superficial temporal artery (STA) pseudoaneurysms are rare occurrences, with some several hundred cases reported in the literature. The history of the first ever described aneurysm of temporal artery dates back to the first middle of the seventeenth century, and is related to the work of Thomas Bartholin.^[1,11] Although several sources defer the first report of such a case with almost

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a century after its original publication, the documented remote year of 1644 coincides with the lifespan of the famous Danish physician, as well as with the precious publications of *Hagae Comitum*, from the Martinus Nyhoff editing house.^[4,7,9]

Albeit relatively rarely reported, the propensity of the STA to form pseudoaneurysms might well be related to the fact that the vessel, in its superficial course, lies directly over the periosteum at the superior temporal line, which renders it vulnerable to trauma.^[18,19] Authors accept the fact that the overwhelming majority of STA aneurysms are due therefore to trauma, however, spontaneous cases occur as well. Table 1 summarizes the main etiological factors leading to the formation of an STA pseudoaneurysm; the table might be not exhaustive.

CASE REPORT

A 21-year-old Caucasian male was admitted to our Department with a 6-month history of a growing and pulsatile mass on the right temple. The mass was tender but not painful, although the patient referred isolated episodes of lancinating ache in his right hemicranium that subsided spontaneously. The patient sustained a blunt trauma after being hit with a stick 6 months prior to the admission. The contusion at that time resolved uneventfully 2 weeks after the trauma, however, a small pulsatile nodule remained, whose dimensions kept increasing.

The physical examination revealed a 10 × 14 mm sized pulsatile mass on the right temple, within the course of the anterior branch of STA. A direct percutaneous puncture and aspiration was performed within the

neurosurgical facility, however, the dimensions of the mass remained unchanged after the procedure.

Transcutaneous sonography was highly suggestive for the presumptive diagnosis of STA aneurysm; after that, a computed tomography (CT) angiography with three-dimensional reconstruction visualized a pseudoaneurysm of the parietal division of the right STA. The enhanced CT image and the reconstruction of the mass in the angiography are presented in Figure 1.

The patient underwent surgery under general anesthesia. The lesion was incised with the patient in a right lateral decubitus, with the incision covering the entire length of the aneurysm (afferent and efferent portions of STA), and reaching approximately 20 mm in our intervention. The entire pseudoaneurysm formation was surgically prepared, after we initially ligated the vessel proximally 5 mm from its sac, where the arterial structure was macroscopically intact. A distal ligature followed, with the removal of the entire mass [Figure 2].

The wound was carefully sutured for an optimal cosmetic outcome, with the patient discharged the day after. In two successive follow-ups (the first 2 months after suture removal, the second after 6 months), the patient had no clinical problems on the right temporal region.

DISCUSSION

After the remote trauma 6 months before, the small remaining nodule over the right temporal region did not interested that much to our patient. That was until some weeks prior to the intervention because the mass grew in dimensions to become visible from a certain distance and to create cosmetic concerns. In addition, the patient felt uneasy to sleep over his right temple, with an uncomfortable but not really painful sensation. These were the reasons for seeking neurosurgical advice, and thereafter for undergoing to intervention we described above.

In fact, reducing the risk of hemorrhage through a potential rupture of the formation, pain and headache relief, and resolving any cosmetic defects are the main objectives of surgical treatment of STA.^[8,20] Long-term bony erosions should be considered an issue of concern, when the lesion is treated through prolonged compression, which might after all be in favor of a definite surgical solution.^[6,10]

A careful differential diagnosis prior to the intervention, and an overall evaluation of potential conservative options of treatment, need to be performed as well. Table 2 summarizes a list of differential diagnoses that should be ruled out before considering the possibility of an STA pseudoaneurysm.

Table 1: Etiological factors leading to a STA pseudoaneurysm formation^[2,3,5,12,14,15,18-20]

Spontaneous pseudoaneurysm	Non-spontaneous pseudoaneurysm		
	Iatrogenic	Non-iatrogenic	
		Sport-related	Non-sport-related
Arteriosclerotic changes	Craniotomy	Hockey	Gun-shot wound
Vasculitis	Hair grafting	Rugby	Battery and assault
Segmental mediolysis arteriopathy	Cyst removal	Basketball	Car accidents
Temporal arteritis	Temporo-mandibular joint arthroplasty	Boxing	Falls
	External ventricular drainage	Squash	
	Gardner traction devices	Paintball	
	Dental surgery		
	Internal carotid artery ligation		
	Scalp punch biopsy		
	Bloodletting*		

*Obsolete and historical usage^[14]

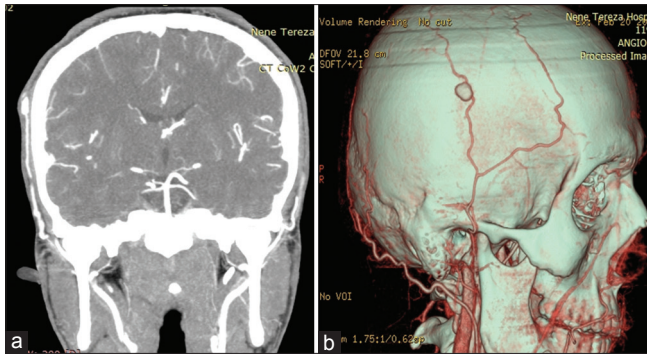


Figure 1: (a) (left inset) Enhanced computed tomography (CT) demonstrating a small mass in the right temporal region. (b) (right inset) CT angiography depicting the pseudoaneurysm in the parietal branch of the right superficial temporal artery

Table 2: Differential diagnosis of STA pseudoaneurysm formation^[13,17-20]

Abscess
Haematoma
Soft tissue tumor
Neuroma
Foreign body granuloma
Aneurysm/arteriovenous fistula of the middle meningeal artery
Inflammatory lesions/inflammatory lymph node
Epidermal inclusion cyst
Angiofibroma
Meningocele/pseudomeningocele
Encephalocele
Parotid mass
Lipoma

CONCLUSIONS

STA pseudoaneurysms are a rare occurrence following traumatic events or other conditions [Table 1], however, the increased number of reports might suggest that their incidence has been underestimated. Treatment options include the conservative management including the manual compression alone, surgical intervention, selective catheterization with endovascular obliteration through thrombin glue injection in the aneurism sac, and endovascular embolization with detachable coils; with all of the above techniques having their pros and cons.^[6,8,10,17] It seems, however, that surgery actually is the treatment of choice, with a better long-term outcome and fewer complications, provided the intervention is made by skilled surgeons. In fact, facial nerve palsy and hypoglossal nerve palsy has been reported following surgical treatment of STA pseudoaneurysms, hence the need for an intraoperative facial monitoring and intermittent stimulation, among other.^[19] Of course, thorough imaging studies need to be performed prior to intervening, with CT, magnetic resonance imaging, ultrasonography, and digital subtraction

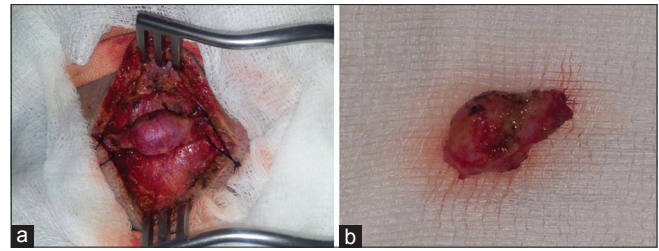


Figure 2: (a) (left inset) Intraoperative image of the pseudoaneurysm. (b) (right inset) The mass surgically removed

angiography being the golden diagnostic standard of this occurrence.^[20] Needle aspiration, although applicable as a diagnostic tool, might be hazardous in an outpatient setting, as some sources suggest, due to the risk of uncontrollable bleeding.^[16]

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Conflicts of interest

There are no conflicts of interest.

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