



# Post Traumatic Pseudoaneurysm of the Superficial Temporal Artery in Child: A Case Report and Review of the Literature

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## Abstract

Pseudoaneurysms of the superficial temporal artery (STA) are a very rare lesion, generally occurring after a recent (weeks to months) episode of blunt head injury. The majority of patients are adults between 20 and 40 years, however a few pediatric cases have been reported. The diagnosis is made by clinical history and clinical examination and the treatment is essentially surgical. We report a case of 7-year-old child, with a pseudoaneurysm of the STA secondary to trauma. In this report, we review briefly the pathogenic mechanism, the presentation, the diagnosis and the treatment of this type of aneurysms.

**Keywords:** Pseudoaneurysm; Temporal superficial artery; Post traumatic; Child

## Introduction

Pseudoaneurysms of the superficial temporal artery (STA) are a very rare lesion, generally occurring after a recent (weeks to months) episode of blunt head injury, they represents less than 1% of total aneurysms [1,2]. The majority of patients are adults; however, a few pediatric cases have been reported. We report a case of 7-year-old child, with a pseudoaneurysm of the STA secondary to trauma.

## Observation

We report the case of a 7-year-old girl, followed for iron deficiency anemia one month ago who consults for right temporal mass associated with headache. The patient consults initially at a peripheral health center where the mass was taken as temporal infected abscess and treated such as after flattening tentative. Due to the consecutive bleeding, an occlusive dressing was put-in and the child was placed under antibiotics.

The same day in evening, the girl's mother discovers her daughter on floor in coma with a puddle of blood around her head, what motivates her urgent admission to pediatric surgery department.

The physical examination has found an unconscious patient with a GCS at 13/15, bloodless, conjunctival pallor with hypotension to 80/45 mmHg. The girl was admitted to the intensive care unit for stabilization and transfusion after finding at the BCF 8 g/dl of hemoglobin. Detailed questioning has found a notion of a trivial head trauma caused by a fall since four weeks.

Given the urgent context and the persistence of bleeding, no further examination was performed (neither ultrasonography nor angiography). And the patient was admitted to the block for surgical exploration under general anesthesia (Figure 1). Surgical exploration objectified the presence of an aneurysm sac of the superficial temporal artery, treated with ligation of both proximal and distal parts of the artery and followed by aneurysmal sac resection.

Postoperative suite was uneventful and the patient was discharged from the hospital five days after, with satisfactory hemoglobin control.

## Discussion

Aneurysms are classified as true, false or dissecting. Most are designated as true while pseudoaneurysms represent less than 1% of total [1,2]. The first case of a pseudoaneurysm of the STA was

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**Figure 1:** Surgical ligation of the proximal part of the vessel under general anesthesia.

published by Bartholin in 1740, and since then more than 400 cases have been reported [1-3]. The majority of patients are adults between 20 and 40 years [4]. However a few pediatric cases have been reported.

It usually appears after a blunt trauma that occurred a few weeks or months before (2-6 weeks), in our case a trivial trauma has been reported in 4 weeks ago. Their causes are especially traumatic (80% of cases) by contact sports, fall, fistfight, mandibular condylar fracture [3,5]. Iatrogenic causes have been also reported from scalp injuries, skin tumor excision, temporo-mandibular joint arthroscopy and arthroplasty, facelift (Botox®), parotid surgery, or neurosurgical use of cranial halo fixation [3,6]. Spontaneous formations of true or false aneurysm have been reported but are extremely rare [6] and occur as a result of congenital defect or atherosclerotic disease.

The STA is the terminal branch of the external carotid and typically has an anterior or frontal branch and a posterior or parietal branch. The most affected artery is the STA, owing to its superficial course and its situation directly against the skull in the area between the frontal and temporal muscles [3,7] with less protection of trauma.

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. 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 [2].

The clinical examination is very important and reveals a slow-growth pulsatile mass in the temporal area in synchrony with the heartbeat. Other symptoms that can appear are headache, ear pain, facial palsy, or hemorrhage. The volume of the mass and the pulsation can be reduced with local compression near the auditory canal [3-6]. A systolic murmur and palpable thrill may also be present.

Differential diagnosis includes lipoma, hematoma, enlarged lymph node, neuroma, abscess, soft tissue tumor, epidermal inclusion cyst, arterio venous (AV) fistula, intracranial lesions, subdural hematoma, aneurysm of the middle meningeal artery with erosion of the temporal bone, or angiofibroma [3,8].

Diagnostic methods other than clinical history and clinical examination are not always necessary to make the diagnosis. However, they rest modalities that may be used to aid or confirm the diagnosis.

Skull X-rays can be used in evaluating fracture induced

pseudoaneurysm [2] but they are poorly sensitive. Doppler ultrasonography can manifest a vessel dilatation in direct continuity with the STA, with turbulent flow, and it can occasionally show the presence of a parietal thrombus within the aneurysm. Contrast CT scan or MRI may reveal extra cranial mass and intracranial pathology, but both are not diagnostic [2,4].

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 [2].

This disease require treatment to reduce the risk of hemorrhage in case of rupture, to relieve headache or cosmetic defect and the compression of adjacent structures, also because it can cause an erosion of the underlying bone of the skull.

Conservative management is not recommended [2]. Surgical ligation of the proximal and the distal parts of the vessel and resection of the aneurysm is considered the treatment of choice [4-8]. Because of the rich vasculature in this region, reconstruction of the vessel is not necessary. This procedure can be done under local anesthesia, but general anesthesia may be preferred with aneurysms close to the facial nerve or parotid gland, and in young or uncooperative patients [5,6] such as our case.

Other treatment options are embolization which is becoming more frequent (using particles, microcoils, balloons, or liquids such as alcohol, isobutyl-2-cyanoacrylate and iophendylate) or ultrasound-guided percutaneous thrombin injection [3,6].

## Conclusion

Traumatic pseudoaneurysm of the superficial temporal artery is an uncommon disease usually secondary to blunt trauma. Clinical history and clinical examination can lead to the diagnosis, and complementary exams such as Doppler ultrasonography, arteriography, or CT angiography confirm it. The treatment of choice is the surgical resection of the lesion and ligation of the proximal and distal parts of the superficial temporal artery.

The severity of the pathology resides, as illustrated in our case, in the fact that the mass can be taken as an abscess and therefore its flattening can be fatal.

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