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Post - Traumatic Pseudoaneurysm of The Superficial Temporal Artery: A Clinical Case and Review of Literature

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Abstract: *Post-traumatic pseudoaneurysm of the superficial temporal artery (STA) represents a rare clinical condition that usually follows blunt trauma; it manifests as pulsatile swelling along the course of the artery in the fronto-temporal site. In this paper, the Authors present a case of post - traumatic pseudoaneurysm of the right STA that developed 2 months after suffering a contusive trauma in the temporal site. With reference to the literature data, we also reviewed the pathophysiology involved in pseudoaneurysm formation and the approach to diagnose and management this type of injury. A thorough clinical examination with the various imaging modalities allows for a correct diagnosis. The treatment of choice is mostly vessel ligation and pseudoaneurysm excision.*
Key words: pseudoaneurysm, superficial temporal artery, trauma.

INTRODUCTION

Post-traumatic pseudoaneurysm of the superficial temporal artery (STA) is a rare vascular lesion and mostly described in case studies. Due to its long 'unprotected' course on the face it may be more frequently vulnerable to traumatic events. The consequence may be the gradual formation of a pseudoaneurysm that usually occurs on average weeks after the triggering traumatic event. This pathology is the result of a posttraumatic injury of the temporal artery wall with subsequent formation of a hematoma that presents clinically as a subcutaneous, more or less large, pulsating swelling synchronous with the heartbeat, and with a tendency to rupture and hemorrhage. In this paper, the Authors present a case of pseudoaneurysm of the right STA that developed 2 months after

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suffering a contusive trauma in the temporal site. With reference to the literature data, the pathophysiology involved in pseudoaneurysm formation and the approach to diagnose and manage this type of injury were also reviewed.

CLINICAL CASE

An 83-year-old man presented to our Emergency Department complaining of a growing swelling at the right fronto-temporal region. The patient had a positive history of blunt trauma in that corresponding area 2 months earlier, and from the time of the trauma the mass had a gradual increase in size and progressive pressure on the affected region. The Patient had a positive history of atrial fibrillation and hypertension, on medication with antihypertensives and oral anticoagulant (warfarin). Clinically, the mass was well defined, approximately spherical, pulsating and non-painful. Complete blood tests were normal except for mild anemia (Hb 12.1 gr/dl) and a slightly reduced INR dosage compared with the therapeutic range (2.16). Confirmatory diagnosis was made by Angio - computed Tomography, which documented the presence, in the right fronto-temporal site, of a right STA supplied pseudoaneurysm with dimensions of 25 x 20 mm (Figure. 1 and Figure. 2). The Patient subsequently underwent surgery to evacuate the hematoma and ligate the superficial temporal branches with excision of the pseudoaneurysm. The postoperative course was smooth and free of complications.

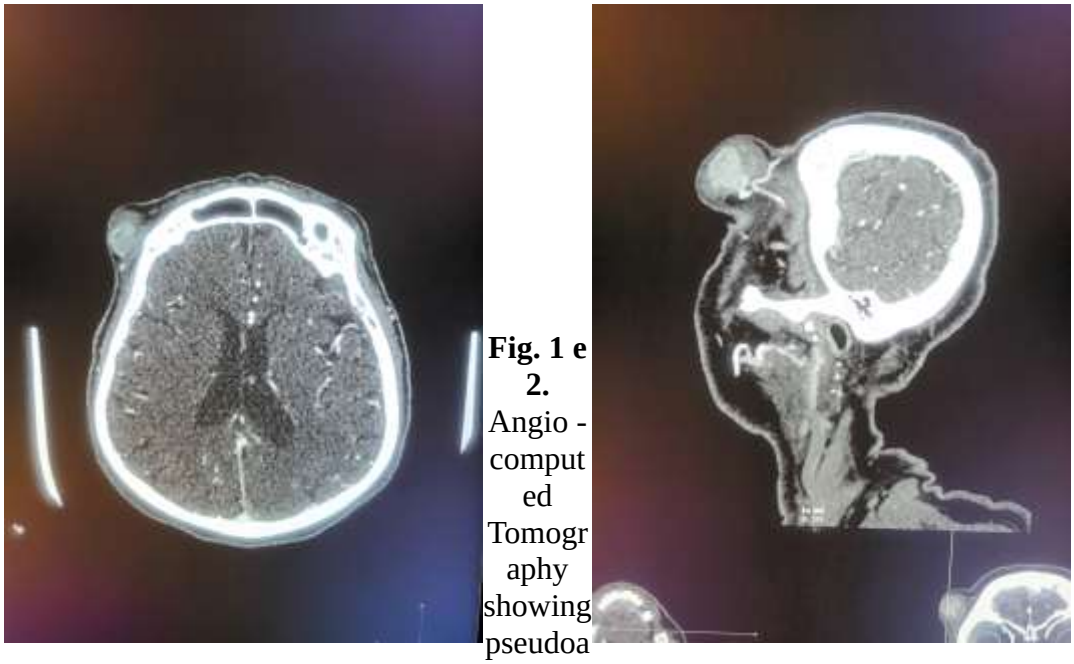

Fig. 1 e 2. Angio - computed Tomography showing pseudoaneurysm of the right superficial temporal artery.

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DISCUSSION

The first case of pseudoaneurysm of the STA was described by Thomas Bartholin in 1740[1,]. Usually representing about 1% of total lesions, those of the superficial temporal artery are rare, they result mostly adult patients with a male to female ratio of 4:1[2,3]. They are mostly caused by blunt trauma while they have a lower incidence if the cause is iatrogenic (5 - 10%); the coagulation defect in Von Willebrand disease may predispose to their formation[4].

The frequency of a temporal vascular lesion seems to depend on the location of the artery itself being superficially and lying directly on the underlying bone structure. In fact, regarding the anatomical aspect, the superficial temporal artery, a terminal branch of the external carotid artery, originates behind the angle of the mandible, within the parotid gland, and ascends in front of the trago up to the temporal subcutaneous region, then dividing into an anterior frontal branch and a posterior parietal branch[5].

In general, pseudoaneurysm is a false aneurysm given the lack of the layers of the arterial wall, and is characterized by a communication, by injury of the artery wall, between the arterial lumen and the surrounding tissue resulting in extravasation and collection of blood confined to the outside of the vessel wall itself; in fact, as a result of the injury of the artery wall, a hematoma is formed that tends to organize itself into a pseudocapsule that expands slowly and progressively due to the supply and pressure exerted by the continuous local blood flow. This slow process would explain the gap between the traumatic event on the temporal region, which occurred weeks earlier (or even months or years later in 15 - 20 % of cases), and the onset of the pseudoaneurysm[6,7].

Clinically, the patient usually presents with a pulsatile, indolent, compressible swelling where a palpable quivers corresponding to systole may also be present (in arteriovenous fistulas, the quivers instead is continuous); in some cases, the pulsation may be absent if there is complete thrombosis. Sometimes, in addition to the infrequent spontaneous rupture and hemorrhage, patients may present with visual disturbances, dizziness, headache, ear pain, or neurological deficits[8].

Regarding the diagnosis, techniques include Doppler Ultrasound, Angio - Computed Tomography or MRI scanning. Ultrasonography is the most effective noninvasive imaging modality, which can provide information on vascular anatomy but it may have some reservation about relationships with adjacent soft tissue or bone structures and in the context of a thrombized pseudoaneurysm. MRI scan is a noninvasive but expensive imaging strategy, may have problems resolving on small vessels, underestimating the size of the lesion, or overestimating the amount of thrombosis. Therefore, especially in urgency, by virtue of shorter scan time and image acquisition-processing, Angio - Computed Tomography is useful not only to confirm the diagnosis, depict the actual size of the pseudoaneurysm or the degree of thrombosis, and plan the preoperative phase, but also to rule out other lesions such as arteriovenous malformations, fistulas, or intracranial pathologies also related with trauma[9,10].

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Surgical indications include the onset of pain from compression or erosion of underlying bone tissue, obvious cosmetic deformity and potential risk of rupture. Surgical ligation and excision of the pseudoaneurysmal tract is considered the treatment of choice with lowest rate of postoperative complications; for the rich facial vascularization, vessel reconstruction is usually not necessary[11]. Endovascular treatment in selected patients may be an alternative modality for treatment of these vascular anomalies, as may obliteration of the lesion using percutaneous thrombin injection but not without complications[12].

CONCLUSION

The appearance of a pulsatile mass in the temporal region chronologically related to previous trauma is highly suggestive of diagnosis of pseudoaneurysm of the STA. Because of the anatomical location of the artery, where skin and fatty tissues remain the only protection of the artery, it can be easily damaged by trauma. Pseudoaneurysms are extra-arterial hematomas that remain in communication with the arterial lumen, often have arterial pulsations and quivers corresponding to systole. When the pseudoaneurysm is thrombized clinical vascular signs may not be present. The slowly developing hematoma and further organization with progressive dilatation of the pseudoaneurysm explain the delayed appearance of the pulsatile mass compared with the time of injury. Careful clinical examination coupled with the various imaging options can enable a correct diagnosis. In urgency, minimally invasive Angio - Computed Tomography allows differentiating or confirming the diagnosis of pseudoaneurysm, in which case it allows an accurate description of its morphology. Needle aspiration technique of these lesions should always be avoided because of the significant risk of uncontrolled bleeding. Surgical excision of the pseudoaneurysm and ligation of the proximal and distal ends are the treatment of choice and have a favorable prognosis.

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Declaration

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Authors' Contribution

ZW: Planned work, conducted the literature search and produced the report.
PM and **PR**: Reviewed literature and produced the report.
BE and **SE**: Helped in contributed to produce the report.
ZW and **VG**: Final revision before delivery.
All authors have reviewed the final report and approve its publication.

Conflict of interest

This work has no financial support by the creator or other sources. None of the authors have any conflicts of interest to disclose.

Ethical considerations

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