

A Traumatic Pseudoaneurysm of the Superficial Temporal Artery

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Pseudoaneurysm arising from the superficial temporal artery (STA) is very rare and is most commonly caused by blunt trauma. Most pseudoaneurysms of the STA usually present as a painless pulsating mass, with concomitant symptoms according to location, and their size may rapidly increase. The treatment of choice is ligation and resection. We present a case of pseudoaneurysm arising from STA after a penetrating injury caused by broken glass. We describe the history, findings of physical examination, Doppler sonography, angiography, histopathology, and the outcome of treatment. We also include a brief review of this condition.

Key Words: Pseudoaneurysm, superficial temporal artery, penetrating injury

Pseudoaneurysm (false aneurysm) is not commonly found in the facial region. On the basis of its history and by physical examination it can be differentiated from other aneurysms, and it should be confirmed by pathologic examination. Whereas a true aneurysm involves three layers of the arterial wall, false aneurysm is the term applied when only the adventitia forms the wall of the aneurysm, or there is no layer at all (Peick *et al.* 1988).

In the facial region, pseudoaneurysms arise most frequently in the STA, and most cases are caused by trauma. This report describes a patient with a traumatic pseudoaneurysm arising from the preauricular branch of the STA.

CASE REPORT

A 62-year-old man visited our hospital because of

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a painless pulsating mass in the area anterosuperior to the left tragus (Fig. 1). He had been injured by broken glass on January 19, 1995, and the wound was immediately sutured at a local clinic. Nine days later, a small pulsating mass developed under the suture site, then slowly enlarged. On February 10, he was admitted for further studies. The mass was round, about 2×2 cm in diameter, and its diameter was found to be diminished at the point of compression of its inferior portion. On auscultation, bruit was not detected and there was no evidence of facial



Fig. 1. This photograph shows a mass in the area anterosuperior to the left tragus.

nerve palsy or trismus. Previous medical history was not significant. Laboratory studies revealed normal blood cell counts and a bleeding tendency. Skull x-ray

films showed no evidence of fracture or foreign bodies. Doppler sonography revealed arterial blood flow in the pulsatile mass (Fig. 2), while on left external

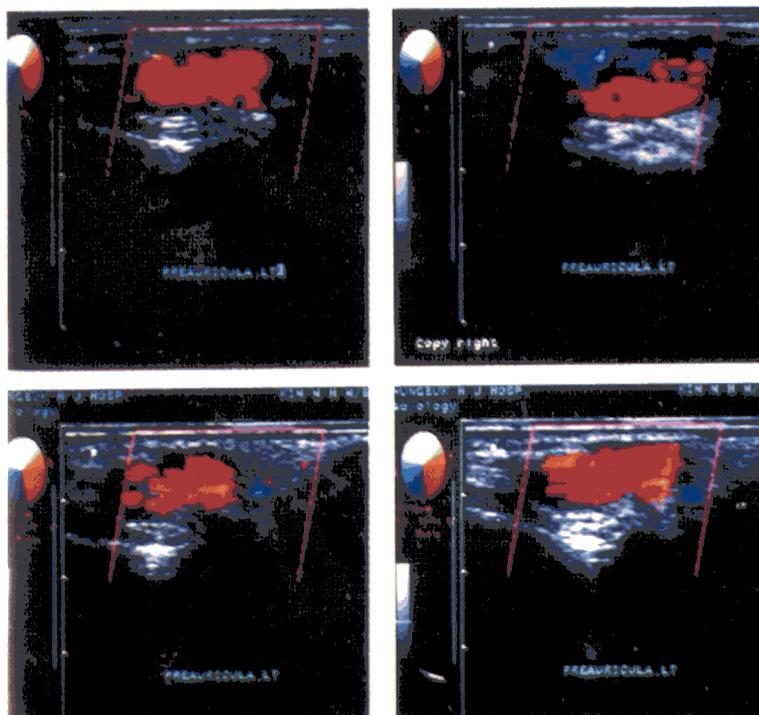


Fig. 2. Doppler sonogram shows the cystic mass with the internal arterial blood flow signal shown in red.

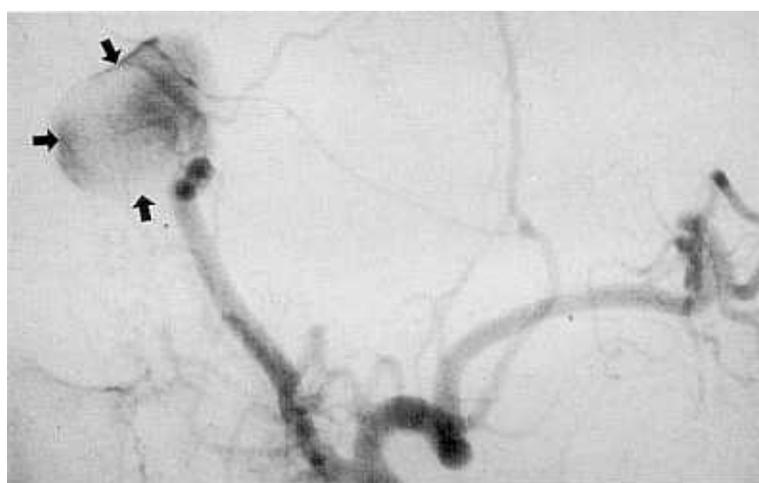


Fig. 3. Lateral view of the digital subtraction selective arteriogram of the left external carotid artery shows an aneurysm (black arrows) of the preauricular branch of the superficial temporal artery.

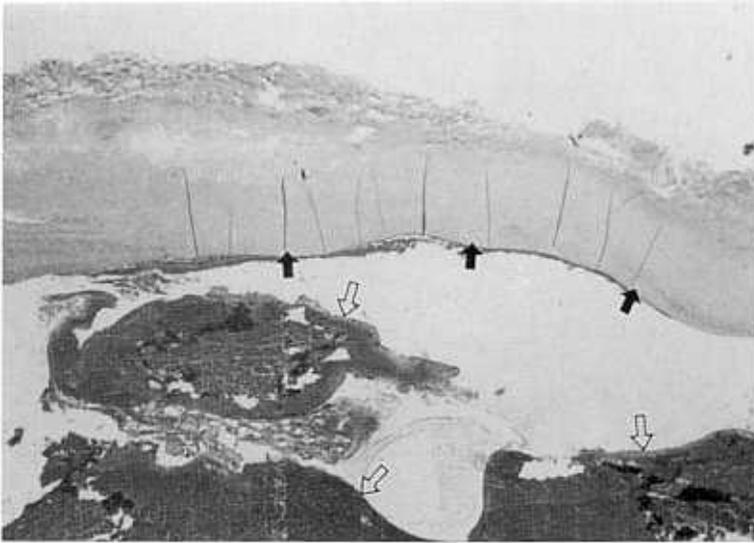


Fig. 4. This photograph shows intraluminal thrombus (white arrows) and a well-encapsulated aneurysmal sac (black arrows) without elastic fibers (H & E staining, original magnification $\times 200$).

carotid arteriography via right femoral artery catheterization, an aneurysmal sac containing internal thrombus was seen in the preauricular branch of the superficial temporal artery (Fig. 3). While a treatment plan was being discussed, the mass enlarged to about 3×3 cm in diameter. The patient was readmitted on March 11, and the aneurysm was ligated and resected. Histopathologic examination showed the mass to be a well encapsulated aneurysmal sac containing intraluminal thrombus. Its capsule did not have any layer of the arterial wall (Fig. 4). The elastic staining also could not reveal any elastic fiber. The patient was discharged on the seventh hospital day without complications. During 3 years' follow-up, there was no evidence of recurrence.

DISCUSSION

Aneurysms are classified as true, false, or dissecting. Most are designated as 'true', while pseudoaneurysms account for less than 1% of the reported total (Peick *et al.* 1988).

The development of a pseudoaneurysm depends on the type of arterial defect. A break in the arterial

wall is caused by trauma and a hematoma forms. Once this is established, a new wall is formed by perivascular organized fibrous tissue. The nature of the surrounding tissues may determine that of pseudoaneurysm. A strong fascial layer delays development of an aneurysm, whereas loose surrounding tissue tends to form more rapidly (Dinner *et al.* 1970).

The superficial temporal artery is the most frequent site of traumatic aneurysm in the face because of its anatomic location. The STA arises from the external carotid artery at the border of the parotid gland, and the temporalis muscle is the only protective tissue present between the STA and the outer table of the skull (Schechter and Gutstein, 1970).

Blunt injuries are the most common cause of traumatic STA aneurysms. These include various sports-related injuries, skull fractures, and accidents. Blunt injuries have accounted for more than 75% of cases (Matsubara *et al.* 1972). Other significant causes are penetrating injuries such as lacerations, gunshot wounds and surgery. Spontaneous aneurysms or those of unknown cause have also been reported (Nishioka *et al.* 1988).

Most traumatic STA aneurysms have presented as a single painless pulsating mass with headache or ear discomfort. Pain may result from pressure on the

surrounding structures and nerves. Patients also complain of visual disturbance, dizziness, hemorrhage, or cosmetic and neurologic defects, depending on the location. Most aneurysms manifest within 2 to 6 weeks of injury, though some are seen much earlier, within 2 to 4 days (Matsubara *et al.* 1972; Peick *et al.* 1988). In this case, the patient recognized the pulsating mass at 9 days after trauma. The mass was easily detected because of its location. The primary physician should consider the possibility of a pseudoaneurysm occurring when a patient visits with penetrating trauma around the area of a superficial temporal artery.

Clinical diagnosis of pseudoaneurysms of the STA is not difficult. A history of trauma is an important clue. Single or multiple lesions may be present. These may or may not be pulsatile or show a bruit. The presence of pulsation and bruit depends on the amount of flow through the vessel and the extent of thrombus within the aneurysm (Bailey and Kiryabwiere, 1973). These are very important findings when an aneurysm is suspected. Compression of the proximal STA should reduce pulsation and the size of an aneurysm, however, this may also be possible in a case of arteriovenous malformation.

Doppler examination, B-mode ultrasound, CT scanning and MRI may confirm diagnosis and demonstrate associated pathologic conditions. Selective angiography may be diagnostic and therapeutic, as well as useful in distinguishing an aneurysm from other extra- or intracranial lesions.

Treatment includes conservative treatment, surgery, or selective catheterization with embolization. Prolonged compression over the lesion is one method of treatment but may produce bony erosion and

cause recurrence (Matsubara *et al.* 1972). Surgical intervention is preferred because the surgical approach is not difficult. Also, rupture and recurrence of an aneurysm can be prevented. Selective catheterization with embolization may be one of the treatments of choice in cases such as complicated facial trauma, or in cases involving deep-seated aneurysms such as those of the maxillary or internal carotid artery, as well as in cases which are intracranial (Field *et al.* 1979).

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