Traumatic superficial temporal artery pseudoaneurysm in a patient under DOAC: a case report

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Abstract:

Pseudoaneurysm of the superficial temporal artery (STA) is an uncommon vascular complication, usually, with a traumatic or iatrogenic etiology and a delayed appearance. Diagnostic imaging with duplex ultrasound, computed tomography or magnetic resonance angiography is useful to confirm the diagnosis. Surgical excision is the treatment of choice, especially in patients under anticoagulant treatment. In this case, a direct oral anticoagulant (DOAC) factor may have a role in the expansion of the pseudoaneurysm. An 88-year-old male patient, under long-term anticoagulant therapy with rivaroxaban, developed a STA false aneurysm after a minor head blunt trauma, which was treated successfully by surgical excision.

INTRODUCTION

Pseudoaneurysm of the superficial temporal artery (STA) is an uncommon vascular complication, following blunt head trauma or face and head procedures (iatrogenic). It is estimated that 400 cases of pseudoaneurysms have been reported, comprising 1% of all traumatic aneurysms.[1] True temporal artery aneurysms are even rarer and usually have an atherosclerotic or congenital etiology.[1] Herein we report a case of an 88-year-old male under long-term anticoagulant therapy with rivaroxaban suffering from a traumatic pseudoaneurysm of the superficial temporal artery. This report has been approved by the Ethics Committee of the Hospital.

CASE REPORT

An 88-year old male patient with a history of atrial fibrillation under treatment with Rivaroxaban (15mg per day) presented to the outpatient department because of a frontal painless mass. He referred a minor blunt head trauma due to a fall 3 months ago. The mass started to develop 3 weeks after the fall and continued to expand thereafter. No other regional or neurological symptoms were reported. Clinical examination revealed a pulsatile, non-tender, subcutaneous, mobile mass measuring approximately 3 cm in diameter, located to the left frontal-temporal region. A color duplex ultrasound confirmed the diagnosis of a pseudoaneurysm of the frontal branch of the left superficial temporal artery. A surgical treatment was decided. Anticoagulant treatment with Rivaroxaban was interrupted 48 hours before surgery. An excision and ligation of the branches took place under local anesthesia. The patient was discharged the same day and restarted his oral anticoagulant therapy the first postoperative day. Histopathological examination was conclusive of a pseudoaneurysm. At 6-month follow up the patient was well having a normal life.

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DISCUSSION

Superficial temporal artery is the terminal branch of the external carotid artery, responsible for the vascularization of the temporal scalp. It is situated between the temporal fascia and the temporal muscle. The aneurysms of the temporal artery are rare and usually concern its superficial branch. Most of the aneurysms (95%) are pseudoaneurysms caused by blunt head trauma during sports activity in young patients or falls in elder patients.[2] Iatrogenic injury during neurosurgical procedures has also been described.[3]

Most aneurysms are clinically revealed a few days to months after trauma. Diagnosis could be made only on history and physical examination. As in this patient, typical history involves a minor head blunt trauma, followed by the delayed appearance of a mass. A compressible, tender or pulsatile mass located to the frontal scalp is apparent. A bruit or thrill may be detected. Neurological symptoms are uncommon and may include headache, dizziness, ear discomfort, or facial droop due to cranial nerve VII compression.[1] The differential diagnosis includes cyst, lipoma, abscess, simple hematoma, arteriovenous fistula, tumor and aneurysms of the middle meningeal artery with bone erosion.[4] Temporal artery pseudoaneurysms are under risk for a spontaneous or traumatic rupture.[5]

Diagnostic imaging is useful to confirm the diagnosis and differentiate it from other pathologies. In our case, color duplex ultrasound was used. Other reports describe computed tomography angiography to confirm diagnosis. Duplex ultrasound is the imaging modality of choice since it can provide detailed information about the vascular anatomy, without the need for any radiation exposure.[6] Usually, a normal waveform is

presented in the artery. "Ying-yang" sign and "swirling pattern" waveform can be detected during DUS and help in differential diagnosis from other pathologies as arteriovenous fistula.[7] CT or magnetic resonance (MR) angiography could be needed in cases where a concomitant intracranial pathology is suspected.[7]

Conservative treatment of these pseudoaneurysms has not been proposed, as there is always the risk of rupture. Surgical excision is the treatment of choice with a low rate of post-operative complications.[8] Continuous pressure over small aneurysms, percutaneous ultrasound-guided injection of thrombin and micro-coil embolization are alternative treatment methods, especially when the aneurysm is located at the proximal superficial temporal artery. Allergic reactions due to thrombin, recanalization and distal ischemia are common complications of those. Follow-up with duplex ultrasound is mandatory in these cases.[9]

Nowadays, the percentage of elder patients under treatment with DOACs is increasing. This is the first report of a patient under treatment with a DOAC presenting with a temporal artery pseudoaneurysm. In the presence of a pseudoaneurysm, a conservative treatment with compression and observation usually fails in this group of patients and an intervention is required.[10] In this case, the pseudoaneurysm continued to expand, while the patient was under a lower dose of rivaroxaban. DOAC may have a role in sac expansion in this case, preventing a likely thrombosis of the aneurysm. Sac expansion is associated with a higher risk of rupture which would be related to an important hemorrhage, especially in a case of a patient under anticoagulant treatment. The careful perioperative use of DOACs was associated with no perioperative complication in our case.

CONCLUSION

Superficial temporal artery aneurysms are a rare complication after blunt head trauma. Careful clinical examination can conclude to a correct diagnosis. Duplex sonography is a useful tool to clarify diagnosis. Surgical treatment is the gold standard of care and minimal invasive approach an alternative in aneurysms of proximal temporal artery. Anticoagulant treatment in elder patients may be associated with larger diameter pseudoaneurysm and a higher risk of rupture. Careful perioperative use of DOACs could lead to avoidance of postoperative complications.

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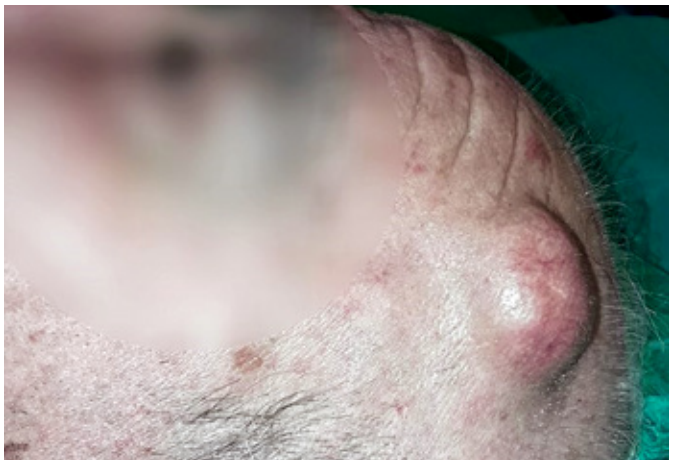

Figure 1. A pseudoaneurysm of the superficial temporal artery after a blunt cranial trauma

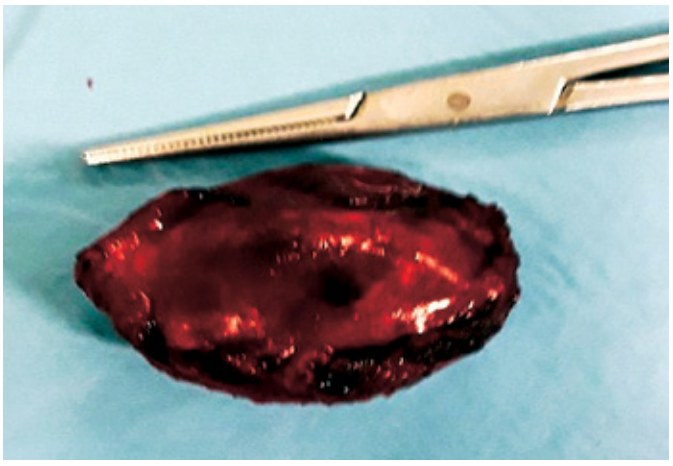

Figure 2. The excised pseudoaneurysm of the superficial temporal artery

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