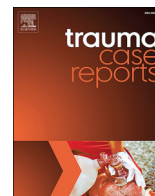


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## Trauma Case Reports

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## Case Report

## Identity of growing pulsatile mass lesion of the scalp after blunt head injury: Case reports and literature review

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## ABSTRACT

A growing pulsatile lump of the scalp rarely occurs after blunt head injury. In this condition, the lump may be a delayed-onset traumatic vascular scalp injury such as a pseudoaneurysm or an arteriovenous fistula (AVF). We describe two cases of delayed-onset traumatic vascular scalp injuries: one involved a pseudoaneurysm of the superficial temporal artery, and the other, an AVF fed by the occipital artery. We reviewed reported cases of delayed-onset traumatic vascular scalp injury and discuss the features, diagnosis and treatment. When a growing lump of the scalp is encountered, ultrasonography may be useful in searching for vascular injuries.

## Introduction

Blunt head injury often causes an immediate lump of the scalp due to subcutaneous hematoma. The lump usually shrinks gradually and heals without intervention. On the contrary, a growing pulsatile lump of the scalp rarely occurs after blunt head injury. In this condition, the lump may be a delayed-onset traumatic vascular scalp injury such as a pseudoaneurysm or an arteriovenous fistula (AVF). Although physicians often encounter chronic subdural hematoma, a well-known delayed-onset traumatic intracranial hemorrhage after blunt head injury [1–3], delayed-onset traumatic vascular scalp injuries are rarely encountered [4,5].

We describe two cases of delayed-onset traumatic vascular scalp injuries: one involved a pseudoaneurysm of the superficial temporal artery (STA), and the other, an AVF fed by the occipital artery (OA).

## Case report

## Case 1

An 87-year-old woman presented to our hospital with a progressive, painless pulsating lump in her right forehead. She had fallen and hit her right forehead 1 month prior. She had no neurological deficits. Physical examination revealed a 5 × 5 cm round mass of the right forehead (Fig. 1A). Ultrasonography showed a blood supply into the mass. Magnetic resonance imaging (MRI) revealed a right subcutaneous mass lesion (Fig. 1B, C), and the mass communicated with the frontal branch of the STA on magnetic resonance angiography (MRA) (Fig. 1D). We diagnosed a traumatic pseudoaneurysm of the STA. The patient underwent surgical resection of the pseudoaneurysm under local anesthesia (Fig. 1E). Histopathological findings confirmed the diagnosis of pseudoaneurysm. The patient's recovery was uneventful.

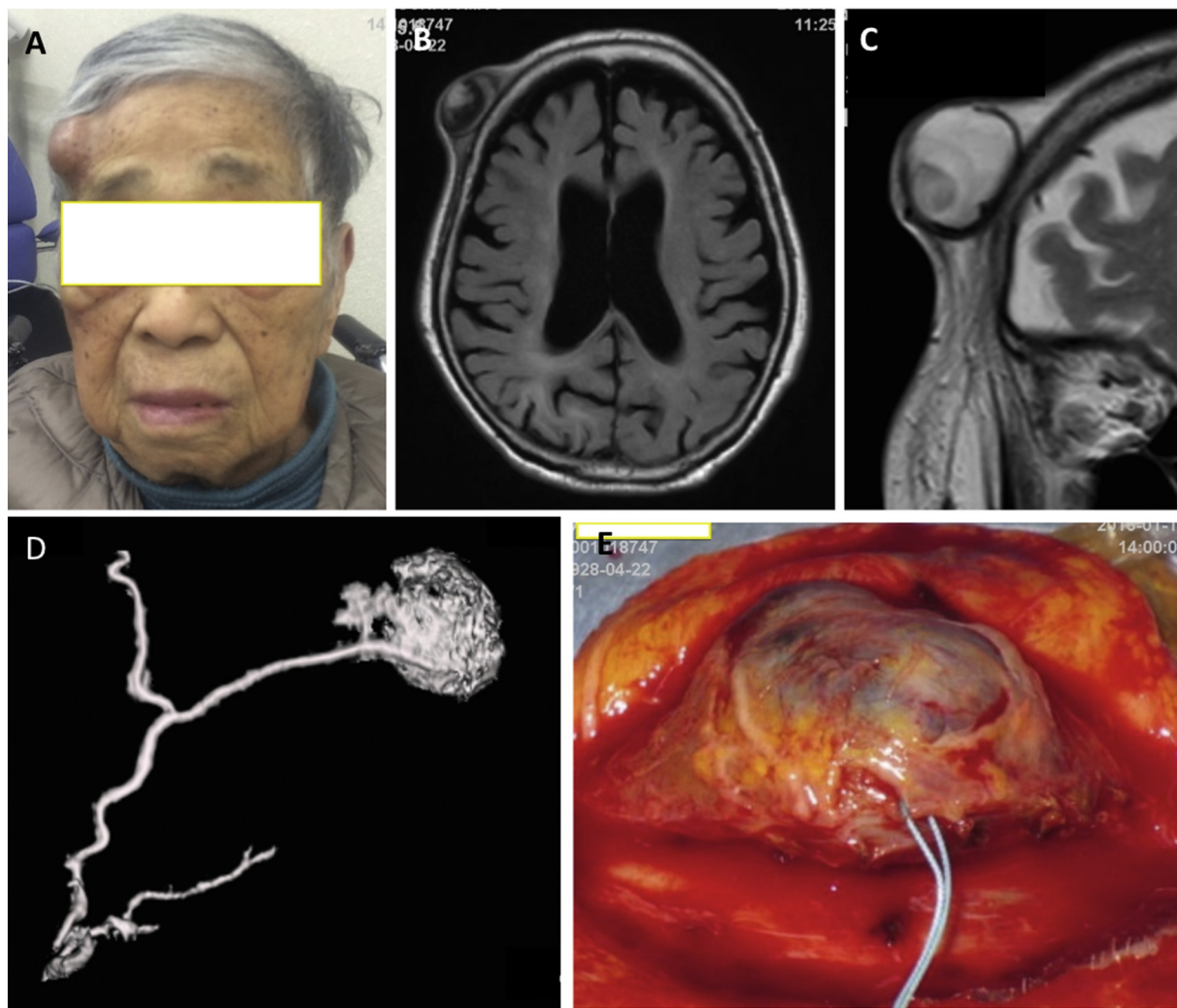
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**Fig. 1.** (A) Macroscopic picture shows a 5 × 5 cm round mass of the right forehead. (B and C) Preoperative magnetic resonance imaging shows a right subcutaneous mass lesion (B: axial image on T1-weighted imaging [WI], C: coronal image on T2WI). (D) Magnetic resonance angiography shows that the mass communicates with the frontal branch of the superficial temporal artery (STA). (E) Intraoperative photograph shows a pseudoaneurysm of the STA.

## Case 2

An 80-year-old woman presented to our hospital with a progressive painful pulsating swelling of her left occiput. She had bumped her left occiput against a door 1 month prior. She had no neurological deficits. Physical examination revealed a 5 × 2 cm mass with redness over the left occiput. Computed tomography (CT) showed subcutaneous swelling in the right occipital region (Fig. 2A). Ultrasonography showed irregular blood flow. Angiography revealed a subcutaneous AVF fed by the left OA (Fig. 2B). The AVF drained into the dilated variceal cutaneous veins. The patient underwent surgical disconnection of the AVF under general anesthesia (Fig. 2C). The small feeders and dilated variceal cutaneous veins were gently dissected from the adjacent subcutaneous tissue. The feeders were all coagulated and cut. The patient's recovery was uneventful. Postoperative CT showed improvement of the subcutaneous swelling (Fig. 2D).

## Discussion

Traumatic vascular scalp injuries such as pseudoaneurysm and AVF are uncommon. Table 1 shows a comparison of their clinical features based on our literature review. They have both common and differentiating characteristics. AVF is rarer than pseudoaneurysm, based on comparison of the reported numbers. They can occur in patients of all ages. However, AVF in elderly patients is rare. Male dominance is seen for both lesions. Although they are usually associated with a growing pulsatile lump of the scalp, clinical manifestations are primarily related to the size and position of the lesion. Patients may present with headache, ear discomfort,

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