# Cirsoid aneurysm of the scalp

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## ABSTRACT

**A 29-year-old man with a pulsatile scalp swelling is presented. The clinical diagnosis of a cirsoid aneurysm was confirmed on computed tomography of the brain and selective cerebral angiography. It is important to detect veins draining from the aneurysm into the intracerebral venous system, as percutaneous occlusion of the aneurysm may be possible in their absence.**



**Keywords: arteriovenous fistula, cirsoid aneurysm, cerebral angiography, cerebral embolisation, scalp aneurysm**

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## INTRODUCTION

Cirsoid aneurysms are rare arteriovenous fistulas of the scalp. They are usually congenital in aetiology. However, traumatic fistulas have also been described.[1,2] They are called "cirsoid" because of the characteristic variceal dilatation of the draining veins (Greek *kirsos* means varix).[3] Treatment options include surgical resection, endovascular occlusion, and direct percutaneous injection of sclerosing agents.[3] The radiological findings are important for patient management.

## CASE REPORT

A 29-year-old man presented with a painful swelling over his right occipital region. He was stabbed in the occipital region 12 months previously. On examination, a pulsatile occipital scalp mass was detected, with large visible draining veins running toward the vertex of the scalp. There was a small area of skin ulceration over the mass but no active bleeding. On auscultation, a bruit was detected over the lesion. The neurological examination was normal. The patient underwent computed tomography (CT) of the brain. A serpiginous subcutaneous mass was demonstrated in the region of the right occipital scalp, which was enhanced markedly (Figs. 1a–b). The patient underwent selective four-vessel angiography. Selective right carotid angiogram demonstrated a markedly tortuous and dilated right occipital artery feeding into a circular or cirsoid


**Fig. 1a** Unenhanced axial CT image shows a serpiginous subcutaneous mass in the right occipital region.

**Fig. 1b** Contrast-enhanced axial CT image shows marked contrast enhancement within the cirsoid aneurysm.


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aneurysm in the right occipital scalp (Fig. 2a). Large draining veins were noted running anteriorly toward the vertex and posteriorly toward the occiput. There was evidence of drainage into the sagittal and transverse sinuses and superior cortical veins via the calvarial emissary veins (Fig. 2b). Because of the intracranial venous drainage, percutaneous occlusion of the cirsoid aneurysm was not attempted and the patient underwent a successful resection of the fistula. He made a complete recovery with no recurrence of the fistula at the three-month follow-up examination.

## DISCUSSION

Cirsoid aneurysms of the scalp were first described in 1833 by Brecht.[4] Only 10%–20% of these arteriovenous fistulas develop following penetrating trauma to the scalp, as in this patient. In 90% of patients, the superficial temporal artery is the main supply to the fistula with only one dominant feeding artery in 71% of patients.[3] In the remaining cases, there is usually involvement of both the superficial temporal and occipital arteries.[3,4] Untreated patients can develop progressive scalp and facial cosmetic deformity from the markedly tortuous subcutaneous vessels. However, this condition is not life-threatening.[3] Surgical resection of the fistula is usually successful, as was for this patient.[3,5,6] Endovascular and percutaneous occlusion of the fistulas have been described. However, the results have been mixed.[3,7,8]

The problem with an arterial approach is that there is recruitment of surrounding normal arteries following occlusion of the arterial feeder and draining venous structures. Arterial approaches may not often be successful in occluding the entire fistula. The results of endovascular occlusion are dependent on the angioarchitecture of the fistula, the supplying arteries and draining venous structures. Arterial approaches may not often be successful in occluding the entire fistula due to the problem of multiple feeding arteries being recruited to supply the fistula. Occlusion of the venous pouch usually requires later surgical removal of the embolic material.[3] A delayed venous phase angiogram is needed to identify all feeding arteries and draining veins, especially if there is drainage into the deep venous sinuses and cortical veins. If the draining sinus is isolated from the rest of the cerebral circulation, it may be possible to consider a transvenous approach using newer embolic material, such as Onyx. However, this was not the case in this patient.

**Fig. 2a** Selective right carotid angiogram shows a markedly-dilated right occipital artery feeding into the fistula in the right occiput.

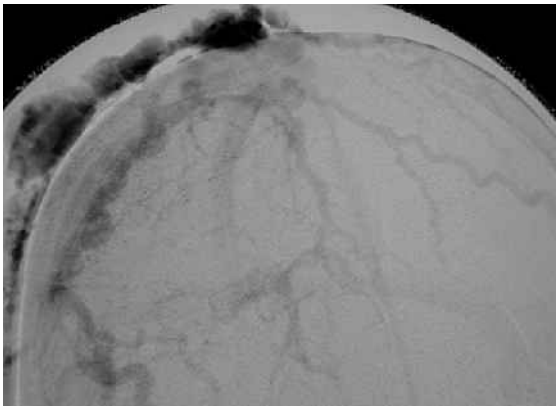

**Fig. 2b** Venous phase angiogram shows the venous pouch and dilated serpiginous-draining superficial and cortical veins from the fistula. Deep venous drainage into the venous sinuses and superior cortical veins of the brain is present.

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