

Technical note

New surgical treatment for a ruptured carotid artery near the skull base

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Carotid body tumours are often sited in a narrow, deep cavity adjacent to the base of the skull, regularly adhere to the carotid artery, and the cover of the mandible results in poor exposure. Given this complicated site, reconstructing the residual ruptured artery after resection is a challenge.¹ To minimise cerebrovascular accidents and neurological complications during operation, we must not only ensure adequate brain circulation, but also time-saving and reliable anastomosis.^{2,3} We report a new surgical treatment that we used on two patients for a ruptured carotid artery near the skull base.

It has been reported that the pressure in the carotid stump is a reasonable indicator of the capacity of the cerebral circulation after the carotid artery has been occluded.⁴ It is widely accepted that a stump pressure above 70 mmHg indicates that there is adequate perfusion to the brain from the contralateral side, but when the pressure is below 50 mmHg, it becomes necessary to use a bypass shunt.⁵

We made an arc-type incision along the anterior border of the sternocleidomastoid muscle. So that we had a clear view of the operative field, nerves, and vessels, we meticulously removed the adipose and glandular tissue from around the tumour. Shortly after resection, as a consequence of the preoperative stump pressure (38.3 mmHg and 43.3 mmHg), we placed a bypass shunt between the common carotid and the internal carotid arteries. To replace the bypass shunt, we

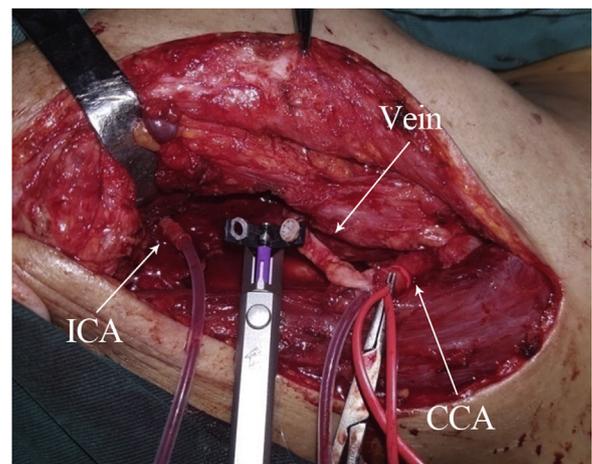


Fig. 1. Arteriovenous anastomosis of the great saphenous vein using a microvascular anastomotic coupler device. (ICA = internal carotid artery, CCA = common carotid artery and Vein = great saphenous vein).

used a prepared autologous saphenous vein that was the same length as the defect.

Allowing for the different diameters of the vessels, the distal side of the saphenous vein was trimmed at a 45° angle and then anastomosed with the distal side of the common carotid artery using continuous hand sutures with 6/0 coated Vicryl (Ethicon) (Fig. 1). To ensure circulation in the brain, we used a microvascular coupler device to anastomose the stump, and sutured nearly three quarters of the common carotid artery while retaining the temporary bypass shunt. The proximal side of the saphenous vein (4 cm in diameter) was anastomosed with the proximal side of the internal

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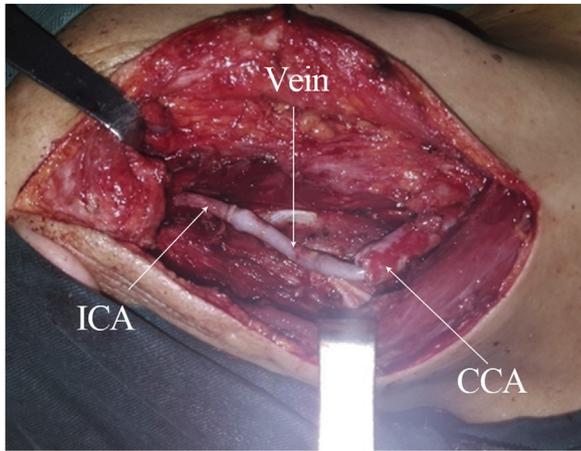


Fig. 2. The saphenous vein and artery after anastomosis (ICA = internal carotid artery, CCA = common carotid artery and Vein = great saphenous vein).

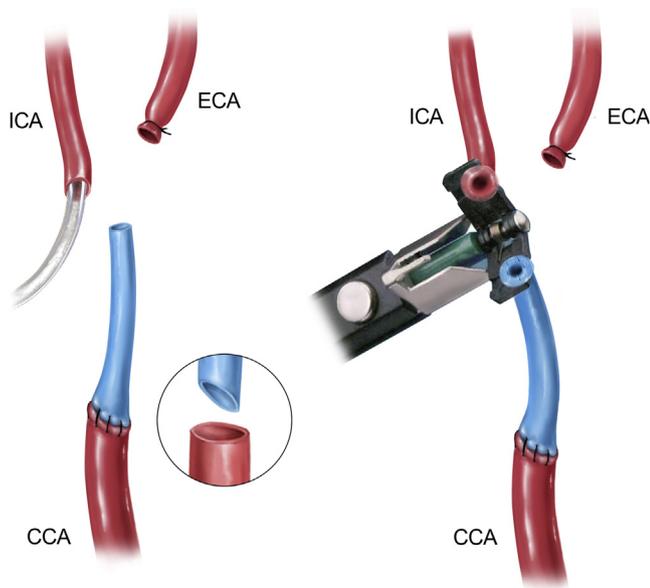


Fig. 3. Continuous hand suturing of a processed saphenous vein and common carotid artery showing first the microvascular anastomotic coupler device and secondly the anastomosis of the common carotid artery and saphenous vein. (ICA = internal carotid artery, CCA = common carotid artery, ECA = external carotid artery, and Vein = great saphenous vein).

carotid artery using the coupler (Fig. 2). Postoperatively, the patients had their heads routinely immobilised, and were given anti-infection and anticoagulation drugs, and other supportive treatment (Fig. 3). We also did carotid angiography postoperatively (Fig. 4), and both patients have continued to attend for periodic follow up and enjoy normal lives without any severe complications.

The use of an intraoperative bypass shunt and a microvascular anastomotic coupler device for the carotid artery can ensure a safe blood supply to the brain whilst also making the procedure quick and reliable. The procedure seems to be safe and effective in our experience, and it should be con-

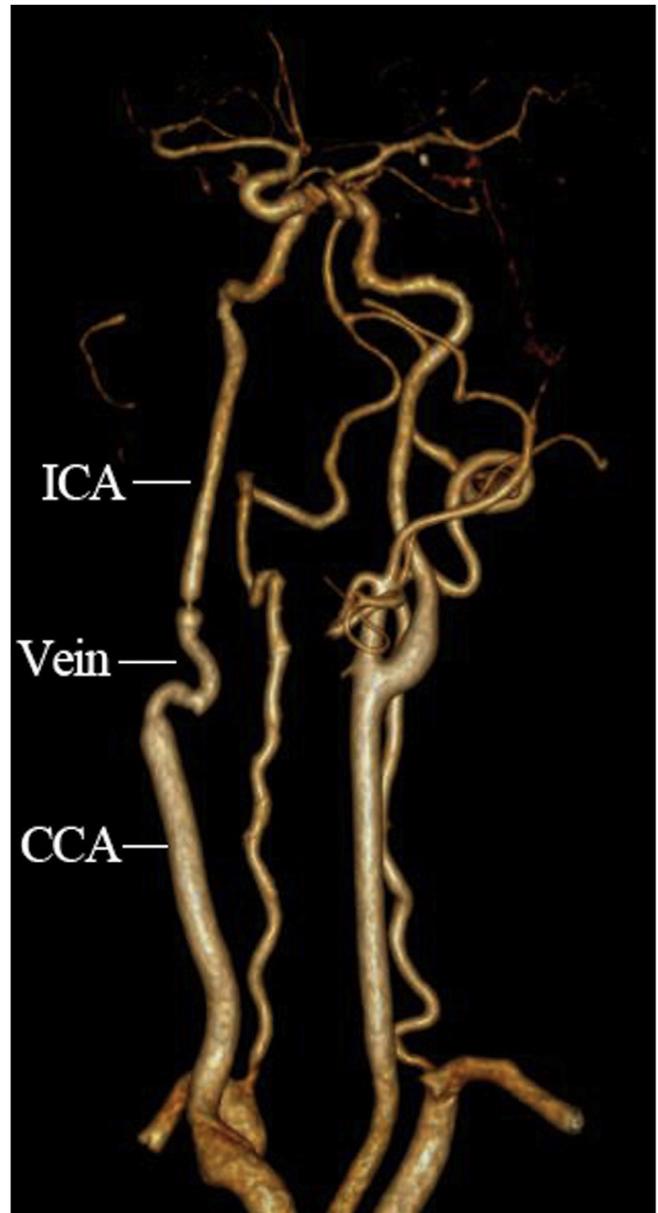


Fig. 4. The patient's computed tomographic angiogram from the 4th month postoperatively. (ICA = internal carotid artery and, CCA = common carotid artery and Vein = great saphenous vein).

sidered during the surgical resection and reconstruction of carotid arteries.

Conflict of interest

We have no conflicts of interest.

Ethical Statement/confirmation of patients' permission

Approval was obtained from the Institutional Review Board of the West China Hospital of Sichuan University. Informed consent was obtained from the patients.

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