

Case Report

Novel carotid surgery in an asymptomatic totally occluded common carotid artery – a case report

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Abstract

We report the case of a 67 year old English woman with bilateral transient cerebral ischaemic attacks who was managed by unconventional surgery. Duplex ultrasound of the carotid bifurcations indicated complete occlusion of the left common carotid artery with retrograde flow from external to internal carotid artery and an ulcerated plaque at the external carotid artery origin. Following ligation of the external carotid artery origin to exclude the ulcerated plaque, the proximal external carotid artery was re-anastomosed to the internal carotid artery, preserving cephalad flow in the internal carotid artery.

This case report provides additional insight into the cause of transient ischaemic attacks and offers an innovative surgical solution which preserves blood flow to the brain. It also emphasises the need for an open minded and innovative approach to vascular surgery.

Keywords: Transient cerebral ischaemic attacks, Duplex ultrasound, Carotid bifurcation, Cerebral blood flow.

Introduction

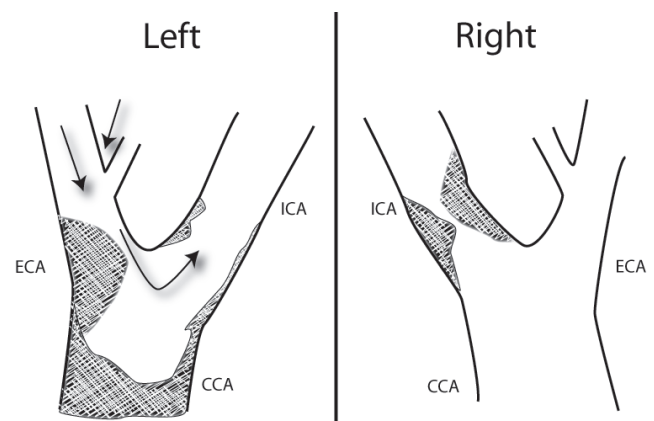
Internal carotid artery occlusion is generally taken to contraindicate carotid endarterectomy but this case report indicates that transient cerebral ischaemic events (TIA) can occur when the common carotid artery is occluded with perfusion of the internal carotid artery from the external carotid artery. Treatment involved an adaptation to conventional surgery which preserved cerebral blood flow as

well as eliminating the embolic source.

An internet search of the medical literature has not identified a similar presentation or management of a patient with TIA's.

Case Presentation

A 67 year old woman was referred urgently to the one-stop surgery clinic having suffered two TIA's. The first TIA caused left leg weakness for which her local doctor

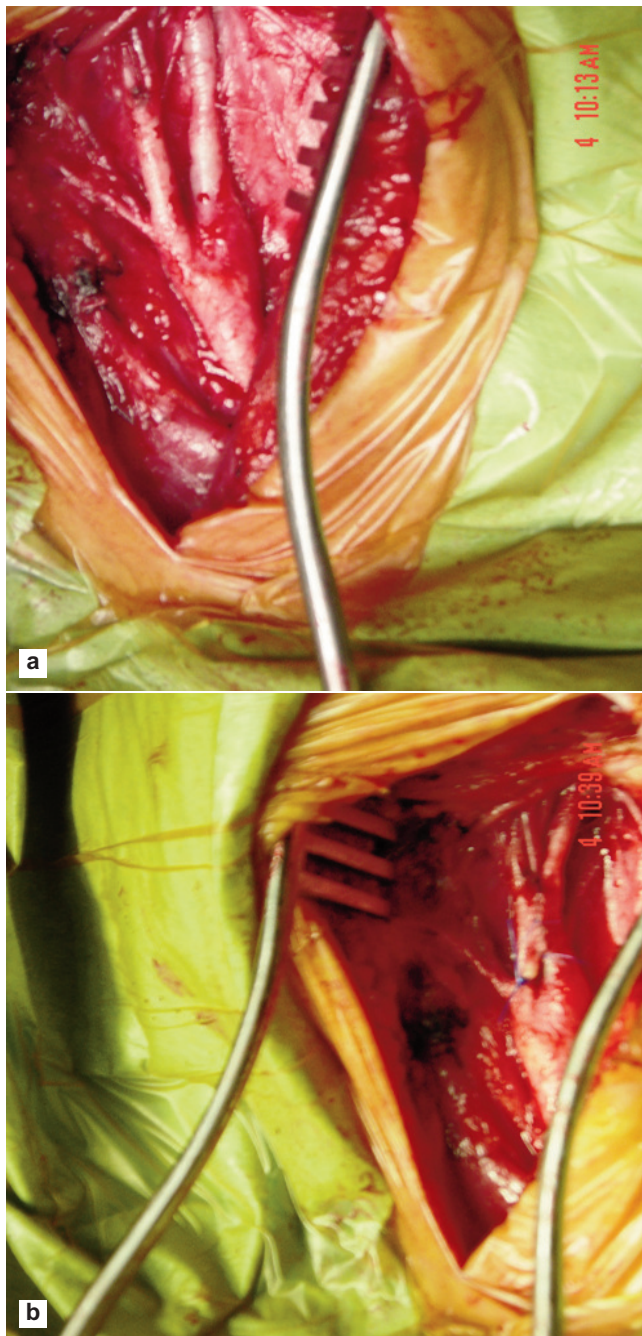


VASCULAR LAB DRAWING OF PATHOLOGY ON DUPLEX SCAN

Figure-1: Diagram of duplex ultrasound scan findings. The left common carotid artery was occluded, ulcerated atheromatous plaque at the origin of the external carotid artery, and cephalad flow through the internal carotid artery from the external carotid artery. On the right side, 80-90% stenosis of the internal carotid artery.

prescribed aspirin. A week later, a second TIA resulted in right hemiparesis and prompted her urgent referral. On both occasions, symptoms fully resolved within hours of onset.

At the clinic, duplex ultrasound scan of the carotid arteries indicated bilateral disease (Figure-1). The right internal carotid artery origin was narrowed by 80-90%. On



PER-OPERATIVE IMAGE LEFT COMMON CAROTID COMPLEX

Figures 2a and b: Intra-operative photographs: a) carotid bifurcation exposed; b) carotid bifurcation exposed; b) proximal external carotid artery ligated and external-internal carotid artery anastomosis.

the left side, the common carotid artery was totally occluded up to the level just below its bifurcation. There was minimal plaque in the internal carotid artery but an ulcerated plaque was noted at the origin of the external carotid artery. Cephalad flow through the internal carotid artery was noted.

The initial management plan was admission of the patient for urgent surgery to the right carotid artery. However, a third TIA occurred with left sided amaurosis fugax. A repeat pre-operative duplex ultrasound showed no changes from the previous scan (Figure-1). The new TIA prompted a change in management plan to undertake surgery to the left carotid artery.

The operative findings confirmed the ultrasound results of an ulcerated stenosis at the origin of the external carotid artery and longstanding common carotid artery occlusion. This ulcerated plaque was excluded from the circulation by ligating the external carotid artery origin and the flow into the internal carotid artery was restored via a side-to-side anastomosis with the external carotid artery above the ligature (Figures-2a and b). The patient made an uneventful recovery and was discharged home on day three with appropriate medical therapy and plans for interval re-admission and contra-lateral surgery.

Before the re-admission, the patient presented again with left arm weakness. No abnormalities were seen on computerised tomography of the brain and there was also no change to the earlier ultrasound scans in the right carotid artery system. On the left side, retrograde flow from external to internal carotid artery with good patency was confirmed. A conventional right internal carotid endarterectomy was undertaken and the patient again recovered uneventfully and was discharged home.

Carotid duplex ultrasound at four months and outpatient follow up at six months confirmed both radiological and clinical success from the surgery.

Discussion

This patient presented with TIA's affecting both sides and for which duplex ultrasound confirmed significant disease of both carotid arteries. It has been estimated that approximately 36,000 patients in the United Kingdom at an incidence of 0.5 per thousand experience a TIA and 125,000 suffer a stroke in a year.¹ TIA's are recognised as an important precursor of strokes and offer a short window of opportunity for treatment of hours or days.² The majority of strokes arise from arterial embolism to the brain of which approximately one in ten originate in atherosclerotic plaques affecting the carotid artery bifurcation.³ This carotid artery disease is traditionally treated by endarterectomy following the principle of ensuring smooth, unobstructed blood flow to the brain.

For this patient, given the recent bilateral symptoms and the combination of severe right internal carotid artery stenosis and occluded left common carotid artery, it was

logical to initially plan to deal with the right sided disease by conventional endarterectomy. However, new symptoms from the left side on the morning of surgery prompted a last-minute change of plan to treat the left side. The combination of findings at the left carotid bifurcation resulted in the innovative approach of ligation and re-anastomosis of the external carotid artery to the internal carotid. Had the right internal carotid flow firstly been restored to normal, then it is possible that this could have resulted in reversed flow down the left internal carotid artery and resolution of the risk posed by the ulcerated plaque at the external carotid artery origin. Ultrasound following the right endarterectomy could then have been used to gauge the need for treatment to the left side. However, it was felt that the very late symptoms from the left side could not be ignored and, with a ready surgical solution available, this side was treated first.

This case is unusual both from the aspect of symptoms occurring bilaterally within a short time but also

from the perspective of the need to change the management plan at short notice and of the unusual surgical procedure required to deal with the left carotid artery.

Conclusion

This novel surgical treatment excluded the embolic source and preserved internal carotid artery flow on the most recently symptomatic side in a patient presenting with recent repeated bilateral TIA's despite an occluded left common carotid artery.

References

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