Short Report

True Aneurysm of the Extracranial Internal Carotid Artery in a 48 Year Old Woman

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Aneurysms of the extracranial internal carotid artery (EICA) are extremely rare, and very few within this already small group have been properly defined as true aneurysms. The common aetiologies include atherosclerosis, trauma or previous surgery, infection and radiotherapy. We present a case of a histologically proven true aneurysm of the EICA, which was repaired under local anaesthetic, by primary end-to-end anastomosis. We discuss the imaging modalities used pre-operatively, our choice of an open repair, and use of local anaesthetic for this procedure.

Key Words: Vascular; Extracranial internal carotid artery; True aneurysm.

Introduction

Extracranial internal carotid artery (EICA) aneurysms are extremely rare, and their surgical repair accounts for less than 1% of all aneurysm repairs undertaken.1 Their aetiology includes atherosclerosis, dysplasia, blunt or penetrating trauma, local radiotherapy, acute dissection and infective lesions. They most frequently present with neurological signs (CVAs, TIs or Horner’s syndrome) or a simple neck swelling. Haemorrhage and compression due to massive aneurysms are uncommon nowadays.

Schecter2 elucidated 853 cases of EICA aneurysm in 820 patients, in a literature review spanning the period 1687–1977. Series presented recently from large centres show that one might expect to encounter this rarity only once or maybe twice each year.1,3 Most of the reported cases arise from an infective or atherosclerotic aetiology,1,2 and review of the literature specifically for true EICA aneurysms reveals very few have been defined as such.4

We present a case of a true ECIA aneurysm in a woman who presented with a painful pulsatile swelling in her neck, and no neurological symptoms. She underwent prompt investigation, and excision with end-to-end arterial anastomosis of her EICA, without complication, and remains well with no recurrence of her aneurysm eighteen months after surgery.

Case Report

A previously fit and well 48-year-old woman presented to her GP with a two-year history of an uncomfortable swelling on the left hand side of her neck. Examination revealed a prominent left carotid bifurcation with an audible bruit over the artery. There was no palpable lymphadenopathy. There was no history of any infective lesion, trauma, or any family history of aneurysm disease.

Initial investigation with duplex ultrasound demonstrated a 1.53 cm saccular aneurysm of the EICA on the left, with a normal artery above and below. Duplex ultrasound examination on the right demonstrated a normal extracranial carotid artery system.

To further define the left EICA and the remaining cerebral circulation, MRI angiography was performed with 3D reconstruction. A T2 weighted brain scan was also performed to investigate possible intracranial lesions. T1 and T2 weighted scans of the neck were done to further define the carotid circulation.

The 3D reconstruction (Fig. 1) confirmed a saccular aneurysm arising from the proximal left EICA. It
showed the ascending pharyngeal artery lying on the surface of the aneurysm, and a normal EICA beyond. The brain scan showed a high signal lesion in the left temporal pole suggestive of an old infarct. The neck scans demonstrated no other abnormalities in the neck vasculature. No intracranial aneurysmal disease was identified.

The patient elected for surgical correction, as she was finding her symptoms troublesome, and was keen for a ‘definitive’ solution. The procedure was performed under local anaesthesia, in keeping with our unit’s policy. The intra-operative appearance of the aneurysm concurred with the MRI findings (Fig. 2). The aneurysmal sac was resected, and continuity restored without tension, by direct end-to-end anastomosis. The use of an arterial shunt was not required and the patient showed no neurological signs during cross clamping. She spent the following 24 h in HDU, and then returned to the ward where her recovery was unremarkable. She was allowed home after 4 days.

Histology of the aneurysm wall (Fig. 3) shows generalised thinning, with focal disruption of the elastic lamina. There was no evidence of infection or other specific pathology and this was considered diagnostic of an uncomplicated true aneurysm of the EICA.

After 18 months of follow-up she remains fit and well, and has developed no further aneurysmal disease.

Discussion

Sir Astley Cooper performed the first successful ligation of a carotid artery aneurysm in 1808 (the
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first unsuccessful one having been carried out three years previously.\textsuperscript{5} Since then many advances have been made in the treatment of carotid artery disease. A true EICA aneurysm is in fact an extremely rare finding, as it is a peculiarity, in the already small group of all EICA aneurysms.\textsuperscript{3, 7}

EICA aneurysms tend to be seen in a relatively young group of patients (average age of presentation is during the 6th decade).\textsuperscript{6, 7} There is a clear preponderance towards men with a male:female ratio of approximately 2:1.\textsuperscript{7}

The most common presentation of an EICA aneurysm is a pulsatile mass in the neck and associated features may include thrombo-embolic phenomena and cerebral ischaemia.\textsuperscript{3} While in this case, no neurological symptoms were elicited, the T2 weighted MRI did demonstrate the presence of an infarct in the temporal lobe on the diseased side. It also ruled out the presence of multi-focal intracranial aneurysms.

The use of 3D reconstruction MRI angiography allowed good delineation of the anatomy and lie of the aneurysm, and permitted clear surgical planning. The T1 and T2 weighted neck scans confirmed that this aneurysm was not associated with contra-lateral disease. In this case, we elected to avoid contrast angiography, as it was felt this more invasive procedure carried higher risks for the patient, and was unlikely to produce more useful images.

Conservative management of EICA aneurysms have resulted in a mortality of nearly 71%.\textsuperscript{8} While rupture does occur, albeit rarely,\textsuperscript{10} the rationale for surgical intervention is based on brain preservation from thrombo-embolism, leading to disabling stroke and possible death. The tendency of small (<3 cm) EICA aneurysms to embolise intra-operatively is low.\textsuperscript{11} Long-term results appear to show lasting neurological stability with a low stroke risk, and satisfactory patency.\textsuperscript{12}

In this case, we felt that the site of the aneurysm was easily accessible surgically, and hoped that we may be able to restore patency with a simple end-to-end anastomosis, though the patient was consented for saphenous vein grafting. While simple ligation is an accepted treatment for EICA aneurysm, it has broadly been superseded by surgical reconstruction.\textsuperscript{6}

Our unit policy is to perform carotid procedures under local anaesthetic unless there is a contraindication. We feel this allows good, continual clinical assessment for the early detection of cerebral ischaemia.\textsuperscript{13–15}

We considered endovascular repair with a covered stent, but felt that it was not appropriate in this case. This new technique is in the early stages of clinical use, and results of large series and long follow-ups are awaited to establish its safety and efficacy, compared to open surgery.\textsuperscript{16, 17}

This unusual case was successfully treated by applying the principles of more routine surgery, and we are happy that at eighteen months follow up there are no complications to report.

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References

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