SHORT REPORT

Retrograde Endovascular Management of a Mycotic Internal Carotid Artery False Aneurysm

D. J. Ferguson¹, J. R. Boyle*¹, J. Millar² and M. J. Phillips¹

Departments of ¹Vascular Surgery and ²Neuroradiology, Southampton General Hospital, Tremona Road, Southampton, SO16 6YD

Key Words: Embolisation; Pseudoaneurysm; Mycotic aneurysm.

Introduction

Parapharyngeal abscesses can rarely be complicated by the development of a false aneurysm of the carotid artery.¹ The condition is more commonly seen in children and is associated with a high mortality if unrecognised. There have been just 30 cases since 1933 reported in the literature with a fall in incidence since the introduction of antibiotics.²

The condition if left untreated has a mortality of approaching 80%³ and this, along with its rarity, highlights the necessity of prompt recognition and treatment. The case presented here illustrates the natural history of such lesions and describes successful management via a novel retrograde endovascular approach.

Case Report

An 8-year-old boy was admitted with severe neck pain, headache and a diffuse tender adenopathy in the base of the posterior triangle of the neck. He was treated with intravenous penicillin and erythromycin after a throat swab grew Group A β hemolytic Streptococcus. His clinical response was poor and over the next 3 days he developed increasing swelling of the right side of his neck. In addition his haemoglobin fell from 11.2 to 7.9 g/dl⁻¹. He was investigated with MRI, which showed a parapharyngeal abscess encompassing the carotid vessels and jugular veins, with evidence of haemorrhage into this cavity.

Under general anaesthesia, examination of the pharynx resulted in spectacular haemorrhage and the pharyngeal cavity was packed. The right external carotid artery (ECA) was ligated and initially the haemorrhage was controlled. However, on removal of the packs the bleeding recommenced. A provisional diagnosis of a false aneurysm of the right internal carotid artery (ICA) complicating the pharyngeal abscess was made and he underwent urgent cerebral angiography, which confirmed the diagnosis, demonstrating the aneurysm at the level of the second cervical vertebra (Fig. 1).

Following four-vessel cerebral angiography that confirmed the adequacy of the Circle of Willis it was decided that the optimum treatment was to occlude the internal carotid artery above and below the false aneurysm using an endovascular approach. A 0.5 cc detachable silicone balloon (D.S.B.) mounted on a Hieshima taper select micro-catheter (Boston Scientific Europe, St. Albans, Herts, U.K.) was passed co-axially through an 8 Fr guide catheter and detached in the carotid bulb. A second 1.0 cc D.S.B. was placed and detached in the distal common carotid artery (Fig. 2).

It was considered unsafe and undesirable to attempt occlusion of the ICA distal to the aneurysm in an antegrade fashion. Thus, having secured haemostasis proximal to the aneurysm, the ICA distal to the aneurysm was approached retrogradely. This was performed via the posterior communicating artery using a 6 Fr-guide catheter placed in the left vertebral artery.

Please address all correspondence to: J. R. Boyle, Mailpoint 67, Southampton University Hospitals NHS Trust, Tremona Road, Southampton, Hampshire, SO16 6YD, U.K.

1078-5884/02/010088 + 0 $35.00/0 © 2002 Elsevier Science Ltd. All rights reserved.
This part of the procedure was carried out under full heparinization because of the risk of thromboembolic complications. A Tracker 14 excel micro-catheter and transcend 14-guide wire combination (Boston Scientific, Europe) on continuous flush, were passed co-axially. The micro-catheter tip was placed at the junction of the horizontal and vertical segments of the petrous part of the right ICA. Five detachable coils (Cook U.K., Letchworth, Herts, U.K.) were placed in the petrous and pre-cavernous segments of the right ICA (total length 92 cm) (Fig. 3). Occlusion was achieved just proximal to the ophthalmic artery origin to maintain its patency.

Completion angiography revealed good filling of the right cerebral hemisphere through the Circle of Willis collaterals with preservation of the ophthalmic artery and a choroidal blush. A brain CT demonstrated no infarction or other gross abnormality. The patient subsequently made an uneventful recovery with no neurological deficit and remains well eighteen months following the intervention.

Discussion

Cervical mycotic carotid pseudoaneurysms whilst rare, are more common in children. Clinical features are variable but suspicions should be aroused when a patient with slowly resolving cervical infection develops anaemia or a pulsatile swelling. Pseudoaneurysm formation occurs typically 14 days after the initial infection. Infection of the parapharyngeal space can be by haemotogenous or direct spread from parapharyngeal or tonsillar sites. It is thought that this infection leads to arteritis and subsequent
false aneurysm formation as the inflammation weakens the arterial wall. Given the variable clinical features, diagnosis may be delayed but Doppler ultrasound, MRI and contrast enhanced CT scanning can be helpful in this respect. Carotid angiography provides a definite diagnosis in most cases as well as a route for potential therapy.

Traditional teaching is that ligation of the affected artery is the treatment of choice, but recent reports have advocated the use of minimally invasive endovascular therapy as an alternative. In 1986, Braun et al. presented the case of a 13-year-old girl who had developed massive haemorrhage from a cervical ICA aneurysm following parapharyngeal infection. They controlled the bleeding by simultaneous local tamponade and coil occlusion of the cervical ICA aneurysm. Gonda et al. reported an ECA aneurysm, which developed from a parapharyngeal abscess. In this case, coil occlusion was attempted but was unsuccessful, and surgical ligation of the ECA was required with the assistance of endovascular balloon occlusion of the inflow. More recently Reisner reported the case of a 6-year-old girl with a mycotic cervical ICA pseudoaneurysm in whom successful endovascular obliteration of the aneurysm was achieved by the deployment of four coils. We believe that our case is the first report of retrograde ICA coil embolisation of an ICA false aneurysm, via the contralateral vertebral artery and the Circle of Willis. Following endovascular embolisation, the prolonged administration of antibiotics is advised, as the coils are a potential nidus of persistent infection.

On the basis of the case illustrated and a review of the literature, we believe that endovascular embolisation of cervical false aneurysms is a safe alternative to surgical ligation. We advocate embolisation of the ICA both proximal and distal to the aneurysm to eliminate the risk of retrograde haemorrhage and this case illustrates that it is feasible to perform the distal occlusion in a retrograde manner. We believe this may be safer than attempting an antegrade approach, which would require catheter manipulation through the diseased segment of ICA with the attendant risk of cerebral embolisation. In more controlled circumstances the antegrade deployment of a covered endovascular stent may be a viable alternative technique, however this would carry the significant risk of stent-graft infection.

References