Resection and reimplantation of a critically stenosed and 360° coiled internal carotid artery

Sidharth Viswanathan, Shashidhar Kallappa Parameshwarappa, Nedounsejiane Mandjiny and Madathipat Unnikrishnan*

Division of Vascular Surgery, Department of Cardiovascular Thoracic Surgery, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, Kerala, India

* Corresponding author. Division of Vascular Surgery, Department of Cardiovascular Thoracic Surgery, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, Kerala, India. Tel: +91-471-2524463; e-mail: unni@sctimst.ac.in (M. Unnikrishnan).

Received 19 January 2014; received in revised form 25 February 2014; accepted 10 March 2014

Keywords: Stroke • Eversion endarterectomy • Coiled internal carotid artery

A 78-year-old man presented with recurrent left hemispheric transient ischaemic attacks. Angiography-wise and intraoperatively extreme internal carotid artery (ICA) coiling was noted with critical stenosis (Figs 1 and 2A). ICA bulb was transected, plaque-bearing segment resected and ICA reimplanted onto endarterectomized carotid bifurcation (Fig. 2B). At 1-year follow-up, he is symptom-free with no stenosis on duplex ultrasound.

Figure 1: (A) Brain magnetic resonance imaging axial fluid-attenuated inversion recovery image demonstrating hyperintensity in the left fronto-parietal region suggestive of infarct. This patient had recurrent transient right upper limb monoparesis. (B) A magnetic resonance imaging time-of-flight angiogram depicting critical stenosis at the left internal carotid artery bulb (white arrow) with 360° coiled distal internal carotid artery (black arrow).
Figure 2: (A) Intraoperative image after dissection of carotid arteries showing plaque-bearing segment of the internal carotid artery bulb, severely coiled and redundant distal internal carotid artery, external carotid artery and superior thyroid artery. Internal carotid artery (ICA) tortuosity from vessel wall weakening can be an aftermath of ageing and atherosclerosis while congenital tortuosity accelerates atherosclerosis by producing flow irregularities. (B) Reimplantation of the straightened and spatulated internal carotid artery onto the carotid bifurcation. Advantages of the ICA ‘resection and reimplantation’ technique include rapid plaque extraction obviating the need to do ICA endarterectomy, decreased susceptibility to restenosis and avoidance of prosthetic patch material. (inset) Resected plaque-bearing segment of internal carotid artery along with endarterectomized common carotid artery plaque. The proximal disease at the common carotid artery (CCA) end was cleared though a sufficient arteriotomy prior to reimplantation of healthy distal ICA onto the CCA.