Spontaneous Resolution of Carotid Stenosis—A Case for Routine Preoperative Duplex Ultrasound

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Spontaneous resolution of carotid stenosis has not been previously reported in the context of preoperative duplex ultrasound scanning, although it has been described as a recognizable phenomenon in the past.

We report a case in whom significant carotid stenosis was noted at the time of listing for surgery on both duplex ultrasound and MRA. On preoperative imaging there was resolution of the lesion and surgery was avoided.

This case emphasises that spontaneous resolution of carotid stenosis can occur and that preoperative duplex is useful as a prelude to surgery and can prevent unwarranted intervention.

Keywords: Carotid stenosis; Preoperative duplex; Spontaneous resolution.

Case Report

A 67-year-old gentleman was admitted to the hospital with sudden onset of left sided weakness, left facial droop and dysarthria. Medical history included a previous TIA, two myocardial infarcts, hypertension, hypercholesterolaemia and 50-pack year smoking history. Echocardiogram was normal. Duplex ultrasound scan (DS) revealed a pseudo-occlusion of the right internal carotid artery (ICA). CT head showed mild age related changes and a small lacunar infarction in the posterosuperior right parietal lobe.

Magnetic resonance angiography (MRA) of the carotids demonstrated a 90% stenosis in the proximal right ICA (Fig. 1). The patient was listed for surgery after making a full recovery from his stroke. Drug therapy during the interval between stroke and the date of planned surgery was aspirin 300 mg daily and dipyridamole 200 mg twice a day. Preoperative DS 5 weeks after the initial scan showed a heterogeneous plaque at the origin of the right ICA but was widely patent and flow patterns were not enhanced indicating stenosis of <25%. To verify this finding, a repeat MRA was performed which also showed no evidence of stenosis within the right ICA (Fig. 2). The patient’s operation was cancelled.

Discussion

Carotid endarterectomy is indicated for patients with symptomatic 70–99% stenosis of the internal carotid artery, such as the patient described in this case report. Carotid angiography (CA) carries risk of up to 4% for transient ischaemic attacks (TIA), 1% for major stroke and <1% for death. CA has been superseded by duplex scanning (DS) and magnetic resonance angiography (MRA) in the last decade. Patel et al. in a comparative study of carotid bifurcations with MRA/CA and DS/CA advocated that MRA and DS had to be performed concurrently to attain the sensitivity and specificity of CA.

Spontaneous resolution of carotid stenosis is rare with few historical reports in the literature and none describing detection by routine preoperative duplex ultrasound. The mechanism is not understood but may represent spontaneous resolution of thrombus within the ICA or possibly resorption of haematoma within a haemorrhagic plaque. In the latter instance one might expect to see it more often than appears to be the case.

Like Devalia et al. it has been our routine practice to undertake immediate preoperative duplex scanning in
order to spare surgery for those 5% of patients who occlude their carotid between diagnosis and surgery. The finding of resolution of stenosis was unexpected in this patient, but the duplex findings were backed up by those on MRA. As duplex is unreliable in low flow states, we have routinely confirmed all our duplex diagnosed pseudo-occlusions with MRA, whereas we normally operate on duplex findings alone where the stenosis is clearly seen. This patient's initial MRA clearly demonstrated an isolated flow void at the ICA origin, rather than the string sign of pseudo-occlusion and so surgery was proposed. When the preoperative DS suggested that the stenosis had resolved, we could not exclude a technical error and so confirmed the finding with a further MRA. Thrombus can be difficult to image as it has the same echogenicity as blood on duplex ultrasound and may only appear as a flow void on MRA, so it is important to try and characterise the plaque composition as much as possible when imaging carotid stenoses.

This case report emphasises the value of routine preoperative duplex scanning, as a small but significant number of patients will be spared unnecessary surgery as a result, either through finding occlusion or, more rarely, resolution of a previously diagnosed carotid stenosis.

References


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