

# Carotid endarterectomy and angioplasty in Scotland: reaching a Scottish view

<sup>1</sup>I Kane, <sup>2</sup>MS Dennis

<sup>1</sup>Stroke Research Fellow, Division of Clinical Neurosciences, Western General Hospital, Edinburgh, Scotland, <sup>2</sup>Professor of Stroke Medicine, Division of Clinical Neurosciences, Western General Hospital, Edinburgh, Scotland

**ABSTRACT** The timing of carotid endarterectomy in patients with symptomatic carotid stenosis is vital if it is to provide maximum benefit to patients. Throughout Scotland there are delays in referring patients to neurovascular clinics and on to surgery, where indicated. Evidence suggests that in those patients with symptomatic carotid stenosis, greater than 70%, surgery should ideally be performed within two weeks. In order to reduce delays to surgery (where appropriate) there needs to be an improvement in the organisation of services so that rapid assessment of high-risk patients can be made.

**KEYWORDS** Asymptomatic carotid stenosis, carotid endarterectomy, stroke, symptomatic carotid stenosis.

**LIST OF ABBREVIATIONS** Asymptomatic carotid stenosis trial (ACST), carotid endarterectomy (CEA), International Carotid Stenting Study (ICSS), transient ischaemic attack (TIA), NHS Quality Improvement Scotland (NHS QIS), Medical Research Council (MRC)

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**Correspondence to** IMS Dennis, Division of Clinical Neurosciences, Bramwell Dott Building, Western General Hospital, Edinburgh EH4 2XU

tel. +44 (0)131 537 3228

fax. +44 (0)131 332 5150

e-mail [martin.dennis@ed.ac.uk](mailto:martin.dennis@ed.ac.uk)

## INTRODUCTION

In the first meeting of its kind in Scotland, stroke physicians, vascular surgeons and radiologists gathered to discuss the provision of CEA across Scotland. Over 100 people (including 57 stroke physicians, 22 vascular surgeons and 15 radiologists) attended the meeting, resulting in a lively debate. The aim of the meeting was to come to an agreement over how patients with carotid artery stenosis should be managed across Scotland. In particular it was hoped that agreement could be reached on how to avoid the delays which currently face many of those with symptomatic carotid stenosis, prior to reaching surgery. Although reaching a national consensus was an ambitious target, it was hoped that the debate would at least highlight current areas within the health service that need to be tackled, in order to improve the current treatment of carotid stenosis in Scotland.

## CEA IN SCOTLAND – THE CURRENT STATE OF PLAY

Professor M Dennis, a stroke physician from Edinburgh, opened the meeting with a review of the available data concerning CEA in Scotland. Although the Coronary Heart Disease and Stroke Strategy for Scotland is well established, CEA was not mentioned until the 2004 edition of the strategy. The 1997 SIGN guideline (14),<sup>1</sup> which included details on CEA for stroke patients, has

been superseded by new evidence, so this meeting was arranged in order to try to reach a consensus about the current place of CEA in Scotland.

According to routinely collected data provided by the Information Services of National Services Scotland, the number of CEAs performed each year in Scotland has risen from around 100 in 1981 to a peak of 500 in 1997 and has now settled at approximately 400 per year. There is a wide variation across Scottish Health Boards, varying from 2 to 16 per 100,000 population. The recorded number of carotid angioplasty procedures in Scotland is very small but has risen from 4 in 1997 to 16 in 2004. The number of combined angioplasty and stent procedures has increased from 6 in 2002 to 13 in 2004. According to the recently published Scottish Vascular Audit Group's audit performed in 1997–99, the majority of CEAs are performed for symptomatic disease, with most stenoses being greater than, or equal to, 70%.<sup>2</sup> That audit demonstrated significant delays between referral to the surgeon and operation – important since the benefits of surgery are greater within two weeks of the most recent event. Data from the ongoing National Stroke Audit show that the proportion of patients being seen in a neurovascular clinic with a stroke or TIA within the target, set by NHS QIS, of 14 days from receipt of referral, ranged between 3% and 92% across Scottish hospitals. The median delay from last event to surgery varied between clinics from a barely acceptable 41 days to a clearly unacceptable 227 days.

## CEA FOR SYMPTOMATIC DISEASE

Professor P Rothwell, a neurologist from Oxford, then presented the most recent evidence concerning the benefits of CEA for symptomatic disease. He referred to the European and North American CEA trials, which showed that CEA is beneficial for recently symptomatic severe carotid stenosis.<sup>3,4</sup> He referred to a systematic review that demonstrated no evidence of increased surgical risk if operating within two weeks of neurological event compared to after two weeks.<sup>5</sup> However, immediate surgery, i.e. within a day or so, carried a high operative risk of around 20%. The greatest benefit to patients is if they have surgery within two weeks, although patients with greater than 70% stenosis may benefit from surgery within twelve weeks of the event. There is no benefit from surgery in those with collapsed distal internal carotid arteries or near occlusions, in terms of preventing major stroke. With an ageing population, the question of CEA in 80 and 90 year olds arose. This group still benefit from surgery, but may have an increased anaesthetic risk. The group in Oxford have developed an ABCD (age, blood pressure, clinical deficit, duration of symptoms) model to try to predict the seven day risk of stroke after TIA.<sup>6</sup> Primary care physicians and A&E staff could use such a tool to triage patients to immediate access to specialist stroke services, with early access to imaging and surgery as required, or to a routine neurovascular appointment. This might reduce the unacceptable delays experienced by many patients without over burdening emergency services. The highest risk patients could be 'fast tracked' or even admitted for urgent investigation including carotid Doppler, etc. If investigations were carried out as an inpatient, these patients would be in the best place to receive thrombolysis should they go on to have a further stroke.

## ASYMPTOMATIC CAROTID STENOSIS

Ms A Halliday, a consultant vascular surgeon from London, presented the results of the ACST.<sup>7</sup> In asymptomatic patients up to 75 years of age, there was net benefit in treating a carotid stenosis of greater than 70% with CEA. The risk of stroke over five years was 6.4% in those allocated early carotid endarterectomy, and 11.8% in those allocated to avoid surgery. This equates to operating on about 18 patients to avoid one stroke in five years. Follow-up is ongoing and will be necessary to establish the longer-term benefits of treating asymptomatic patients balanced against immediate surgical risk. If the small absolute benefit from surgery increases over the first ten years after surgery, then perhaps patients, especially younger patients who have a greater life expectancy, would gain a worthwhile level of benefit from surgery. According to a survey performed by the ACST group the results of the trial have been

associated with a small increase in the proportion of endarterectomies performed in asymptomatic patients in the UK, rising from 9.2% to 16.3%.

## ENDOVASCULAR TREATMENT OF CAROTID STENOSIS

Dr A Clifton, an interventional neuroradiologist from London, gave the final presentation on the endovascular treatment of carotid stenosis. Stents specifically designed for the carotids were first introduced in 1996. The most recent Cochrane review of the randomised trials comparing CEA with carotid angioplasty, with or without stenting, did not find enough evidence to support a widespread change in the current treatment policy for carotid stenosis away from recommending CEA as the standard treatment.<sup>8</sup> There was a strong case to continue randomising patients in the current trials comparing the two techniques, e.g. the MRC funded ICSS. Their research group are seeking centres to join their trial.

## CONCLUSIONS FROM THE MEETING

### 1. *Methods to reduce delays to assessment*

The audience agreed that the current delays in assessing patients with TIA and stroke and the resulting long delays between the event and surgery were unacceptable. Managed Clinical Networks need to reduce delays at all points in the patient's journey. Positive suggestions to achieve this included: use of the ABCD tool to triage patients with TIAs (see above); provision of same day assessment and investigation for high risk patients; and neurovascular and vascular surgical clinics running in parallel to minimise delays in surgical assessment. There was agreement that it would be useful for the Scottish Executive to set a waiting time target for CEA, especially if this could include each part of the patients' journey and acknowledged that additional resources may be required to meet the targets.

### 2. *Avoid screening for asymptomatic stenosis*

At the meeting, six of the Scottish consultant vascular surgeons (half of those present) were prepared to operate on patients with an asymptomatic carotid stenosis. There was concern that patients should not have carotid dopplers unless there was a clear indication for doing it and that the results of the ACST should not encourage the medical profession to 'hunt' for asymptomatic disease. There was some support for the practice of performing carotid duplex on patients due to have coronary artery bypass surgery, but there is no reliable evidence that a carotid endarterectomy reduces the overall risk of stroke under these circumstances.<sup>9</sup> The difficulties of counselling patients about the balance of risks and benefits of carotid intervention were generally accepted and had to take account of individual

patients' abilities to interpret this sort of information. Most present gave patients information about the absolute risk of stroke with and without surgery. Clearly, the absolute benefits of operating on asymptomatic carotid stenosis (11% to 6% over five years) are much less than for symptomatic disease (about 30% to 15% over two years), so that patients are less likely to judge surgery to be worthwhile.

### 3. Outpatient services and CEA services should be part of National Audit

There was general agreement that a coordinated multiprofessional approach was required to optimise patient selection, reduce delays and minimise the risks of carotid intervention, to maximise the cost effectiveness of this important treatment. A Scotland wide system to monitor these aspects of healthcare is required and could build on the National Stroke Audit, in which all Scottish hospitals are currently participating.

## REFERENCES

- 1 <http://www.sign.ac.uk>
- 2 Pell JP, Slack R, Dennis M, Welch G. Improvements in carotid endarterectomy in Scotland: results of a national prospective survey. *SMJ* 2003; **49**(1):53–6.
- 3 Randomised trial of endarterectomy for recently symptomatic carotid stenosis: final results of the MRC European Carotid Surgery trial (ECST). *Lancet* 1998; **351**:1379–87.
- 4 Barnett HJ, Taylor DW, Eliasziw M et al. Benefit of carotid endarterectomy in patients with moderate or severe stenosis. *N Engl J Med* 1998; **339**:1415–25.
- 5 Bond R, Rerkasem K, Rothwell PM. Systematic review of the risks of carotid endarterectomy in relation to the clinical indication for and timing of surgery. *Stroke* 2003; **34**:2290–303.
- 6 Rothwell PM, Giles MF, Lovelock CE et al. A simple score (ABCD) to identify individuals at high early risk of stroke after transient ischaemic attack. *Lancet* 2005; **366**:29–36.
- 7 MRC Asymptomatic Carotid Surgery Trial (ACST) Collaborative Group. Prevention of disabling and fatal strokes by successful carotid endarterectomy in patients without recent neurological symptoms: randomised controlled trial. *Lancet* 2004; **363**:1491–502.
- 8 Coward LJ, Featherstone RL, Brown MM. Percutaneous transluminal angioplasty and stenting for carotid artery stenosis. *Cochrane Database of Systematic Reviews* 2004, Issue 1.
- 9 Naylor AR, Cuffe RL, Rothwell PM, Bell PRF. A systematic review of outcomes following staged and synchronous carotid endarterectomy and coronary artery bypass. *Eur J Vasc Endovasc Surg* 2003; **25**:380–9.

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