



Original Research

Carotid endarterectomy for critical stenosis prior to cardiac surgery: Should it be done? A retrospective cohort study



Mohammed Ashrafi*, Stephen Ball, Abid Ali, Iraj Zeynali, Vittorio Perricone

Department of Vascular Surgery, Blackpool Teaching Hospitals NHS Foundation Trust, Blackpool, UK

HIGHLIGHTS

- Carotid disease has been implicated in the aetiology of post cardiac surgery stroke.
- Stroke and MI significantly higher in patients undergoing staged CEA pre-cardiac surgery.
- Staged carotid intervention cannot be justified based on these results.
- Increased risk of stroke post cardiac surgery needs to be accepted.

ARTICLE INFO

Article history:

Received 22 September 2015

Received in revised form

1 December 2015

Accepted 18 December 2015

Available online 11 January 2016

Keywords:

Carotid endarterectomy

Carotid disease

Cardiac surgery

Stroke

ABSTRACT

Introduction: Stroke remains a major cause of morbidity and mortality after cardiac surgery affecting 2% of patients. Extra-cranial carotid artery disease has been implicated in the aetiology of post cardiac surgery stroke. The aim of the study was to evaluate and compare the morbidity and mortality in patients undergoing cardiac surgery with or without staged carotid endarterectomy (CEA) in a tertiary referral centre.

Methods: A 5 year retrospective study was performed. The primary endpoints were defined as peri-operative stroke and myocardial infarction (MI) with secondary outcome defined as death within 30 days of surgery.

Results: In total 5924 cardiac procedures and 29 staged CEAs were performed. The rate of stroke and MI was significantly higher in patients undergoing staged CEA pre-cardiac surgery compared to patients undergoing cardiac surgery with confirmed or presumed normal carotid arteries (10.34% vs 1.43%; $P = .008$ and 13.79% vs 0.38%; $P < .0001$, respectively). There was no significant difference in the stroke and MI rate in those patients undergoing cardiac surgery with confirmed or presumed normal carotid arteries compared to those with significant carotid disease undergoing cardiac surgery with no prior carotid intervention (1.43% vs 3.16%; $P > .05$ and 0.38% vs 1.05%; $P > .05$, respectively).

Conclusions: Carotid disease is associated with an increased risk of stroke post cardiac surgery. Staged carotid intervention cannot be justified based on these results. Increased risk of stroke post cardiac surgery in patients with significant carotid disease needs to be accepted, as the risk of stroke and MI during carotid intervention pre cardiac surgery is significantly higher.

© 2016 IJS Publishing Group Limited. Published by Elsevier Ltd. All rights reserved.

1. Introduction

Stroke remains a major cause of morbidity and mortality post coronary artery bypass graft (CABG) surgery with an incidence of 2% [1]. Up to 16% of patients with coronary artery disease have

concomitant significant carotid artery stenosis [2–4]. The aetiology of peri-operative stroke is debated with aortic arch manipulation, blood pressure fluctuation, cardiopulmonary bypass use and significant carotid artery stenosis all possible contributing factors [5–8]. Although carotid stenosis is linked with post cardiac surgery cerebrovascular events, it remains unknown as to whether this is a causative or associative factor [9,10]. Therefore the optimal treatment of incidentally found asymptomatic severe carotid artery stenosis prior to CABG still remains controversial [11] and no consensus has been reached [12]. Unfortunately there are still no

* Corresponding author. Department of Vascular Surgery, Blackpool Teaching Hospitals NHS Foundation Trust, Blackpool Victoria Hospital, 38 Whinney Heys Road, Blackpool, FY3 8NR, UK.

E-mail address: mohammedashrafi@doctors.org.uk (M. Ashrafi).

prospective randomised controlled trials to answer this question. Options for management include synchronous carotid endarterectomy (CEA) and CABG, staged CEA followed by CABG, reversed staged CABG followed by CEA or CABG without carotid intervention [13]. Another possible option is the use of carotid artery stenting [13] (CAS) prior to cardiac surgery. Carotid intervention prior to cardiac surgery is not without risk. Naylor et al. identified a 10–12% combined cardiovascular risk of death, stroke and myocardial infarction (MI) during the 30 day peri-operative period following staged or synchronous procedures [14]. Our aim was to evaluate and compare the morbidity and mortality in patients undergoing cardiac surgery with or without staged carotid endarterectomy (CEA) in a tertiary referral centre.

2. Materials and methods

A retrospective study at a single tertiary cardiothoracic institution was undertaken. Electronic and case note analysis was performed on all patients' undergoing cardiac surgery over a 5 year period between January 2008 and December 2012.

The diagnosis of carotid artery disease was made during the pre-operative clinical workup for cardiac surgery. Patients who met the local departmental guidelines had a carotid duplex ultrasound in a dedicated vascular laboratory. These were age greater than 75, left main stem disease, auscultation of a carotid bruit in the neck or history of cerebrovascular disease. Significant carotid disease which was defined as unilateral or bilateral stenosis $\geq 70\%$. Not all patients considered for cardiac surgery who underwent a carotid duplex ultrasound went on to have cardiac surgery.

All patients selected for carotid intervention were treated using the staged approach, i.e. CEA was performed first, followed by cardiac surgery at a second operation. Patient selection for staged CEA was made by one of four vascular surgeons at the institution based on personal practice. Decisions to operate were based on previous history of stroke, the severity of carotid stenosis, the complexity of the cardiac surgery and patient choice. In patients with bilateral disease, surgery was performed on the carotid artery supplying the dominant cerebral hemisphere.

All patients underwent a standard CEA under either general or local anaesthesia. An anterior approach with selective shunting and patch repair was performed. A variety of cardiac procedures were performed (CABG, valve replacement, or a combination of CABG and valve replacement).

The primary outcomes were defined as stroke and MI within 30 days of either carotid or cardiac procedure. Secondary outcome was defined as 30 day all cause mortality.

Postoperative stroke was defined as a new focal neurological deficit lasting more than 24 h.

For the purpose of analysis, the patients were divided into four groups: (A) Patients undergoing cardiac surgery with confirmed or presumed normal carotid arteries; (B) patients undergoing CEA pre cardiac surgery; (C) patients post CEA and undergoing cardiac surgery; (D) patients undergoing cardiac surgery with significant carotid disease that had no prior carotid intervention.

Institutional board review was not required as this was a retrospective study of prospectively collected information on an electronic database regarding outcomes following procedures and reviewing patient case notes. There is no patient identifiable data presented and there is no way of identifying individual patients and therefore patient consent was not required. The work has been reported in line with the STROBE criteria [15].

Continuous data were summarised as the mean \pm standard deviation, and categorical data were described as counts and percentages. Differences were analysed using a combination of Pearson Chi-square test and Fisher's exact test as appropriate. A P value

of < 0.05 was considered statistically significant. Statistical analyses were performed using Statistical Package for Social Sciences for Windows version 21.0 (SPSS, IBM, Armonk, NY, USA).

3. Results

A total of 5924 (4288 males; mean age 66.70 ± 10.91) patients underwent cardiac surgery. Eighty-seven patients (1.47%) had a stroke and 25 patients (0.42%) had an MI in the 30 day peri-operative period. There were 137 deaths (2.30%) within 30 days from cardiac surgery.

Over the 5 year period, 2842 patients considered for cardiac surgery underwent carotid duplex ultrasound prior to any surgical intervention. A total of 210 patients (7.39%) were identified to have significant asymptomatic carotid disease (Table 1). The majority 123 patients (4.33%) had unilateral stenosis $\geq 70\%$; 20 patients (0.70%) had bilateral stenosis $\geq 70\%$; 52 patients (1.83%) had unilateral occlusion and contralateral stenosis between 50 and 70%; 11 patients (0.39%) had unilateral occlusion and contralateral stenosis $\geq 70\%$; and 4 patients (0.14%) had bilateral carotid occlusions.

There were 5809 patients who underwent cardiac surgery with confirmed or presumed normal carotid arteries. There were 83 strokes (1.43%), 22 MIs (0.38%) and 129 deaths (2.22%) within the peri-operative period (Fig. 1; Table 2).

Twenty-nine patients (13.81%) with significant carotid disease confirmed by carotid duplex ultrasound underwent CEA prior to cardiac surgery. Of these, 14 patients underwent CEA for unilateral stenosis, 6 for bilateral stenosis, 5 for unilateral occlusion and contralateral 50–70% stenosis, 2 for unilateral occlusion and contralateral $\geq 70\%$ stenosis and 2 for unknown level of carotid disease. There were 3 (10.34%) strokes post CEA pre-cardiac surgery (2 ischaemic, 1 haemorrhagic). Four patients (13.79%) had an MI and 2 patients (6.90%) died (1 cardiac cause, 1 neurological cause) post CEA in the peri-operative period (Fig. 1; Table 2).

Twenty patients went on to have cardiac surgery after CEA. The reasons for subsequent withdrawal of 9 patients from cardiac surgery were death, obesity, patient choice or a significantly high anaesthetic risk for cardiac surgery. Post cardiac surgery 1 patient (5%) had a stroke and 2 patients (10%) had an MI all of which were new events. The 30 day mortality was nil (Fig. 1; Table 2).

Ninety-five patients (52.49%) with significant carotid disease confirmed by carotid duplex ultrasound underwent cardiac surgery with no prior carotid intervention. There were 3 strokes (3.16%) in this group (1 had unilateral carotid occlusion and contralateral stenosis; 1 bilateral stenosis $\geq 70\%$; 1 unilateral stenosis). One patient (1.05%) had an MI in the peri-operative period and 8 patients (8.42%) died within 30 days of cardiac surgery (Fig. 1; Table 2).

Patients who underwent staged CEA had a significantly higher stroke rate than those who underwent cardiac surgery with confirmed or presumed normal carotid arteries (10.34% vs 1.43%; $P = .008$). They also had a significantly higher rate of MI (13.79% vs 0.38%; $P < .0001$). There was no statistically significant difference between peri-operative death rate between the two groups (6.90% vs 2.22%; $P > .05$) (Table 3).

Patients with significant carotid disease who underwent staged CEA pre-cardiac surgery had a higher stroke rate than those patients who underwent cardiac surgery alone, although this did not reach statistical significance (10.34% vs 3.16%; $P = .140$). They also had a significantly higher rate of MI (13.79% vs 1.05%; $P = .011$). There was no statistically significant difference between peri-operative death rate between the two groups (6.90% vs 8.42%; $P > .05$) (Table 4).

There was no significant difference in the stroke and MI rate in those patients undergoing cardiac surgery with confirmed or presumed normal carotid arteries compared to those with significant

Download English Version:

<https://daneshyari.com/en/article/4285564>

Download Persian Version:

<https://daneshyari.com/article/4285564>

[Daneshyari.com](https://daneshyari.com)