

## SCIENTIFIC LETTER

# Percutaneous coronary intervention in octogenarians with refractory angina

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Very elderly patients are excluded from most trials of percutaneous coronary intervention (PCI).<sup>1,2</sup> There is little contemporary data to guide clinical decision making, particularly in elderly patients presenting with acute coronary syndromes. We have analysed the procedural outcomes of patients 80 years or older undergoing PCI in our centre.

## METHODS

All patients over 80 years of age undergoing PCI between January 1996 and December 1999 were identified from the catheterisation laboratory computer database. Baseline clinical characteristics, indications for coronary intervention, and procedural outcomes were obtained by retrospective review of hospital records.

All patients received a heparin bolus (5000–10 000 IU), administration of abciximab was at the operators' discretion, and postprocedural heparin was not used routinely. Routine antiplatelet treatment included long term aspirin, and ticlopidine or clopidogrel for four weeks, usually with preloading.

Lesions were classified according to the American College of Cardiology/American Heart Association grading system. Immediate angiographic success was defined as deployment of the stent at the site of the lesion with a residual stenosis < 30%. Clinical success was defined as angiographic success plus the absence of major adverse cardiac events (MACE) while in hospital for the index PCI—that is, myocardial infarction, the need for repeat revascularisation, coronary artery bypass grafting (CABG), or death.

Follow up data were obtained by questionnaires sent both to the patient and their general practitioner. Information obtained at follow up included Canadian Cardiovascular Society (CCS) angina class and rates of target lesion revascularisation, subacute stent thrombosis, and MACE. All patients with recurrent symptoms underwent objective assessment with stress testing and/or repeat coronary angiography. Data were expressed as means or proportions.

## RESULTS

Eighty eight consecutive patients  $\geq$  80 years old (50 men), with a median age of 82 years (range 80–93 years), underwent intervention during the study period. Demographically, 35 had a history of previous myocardial infarction, 11 were diabetic, seven had symptomatic peripheral vascular disease, and 17 demonstrated renal impairment. Most patients (72%) had an acute coronary syndrome failing to settle despite aggressive anti-anginal medication (aspirin 89%,  $\beta$  blocker 61%, calcium antagonist 67%, oral/intravenous nitrate 69%, fragmin/heparin 35%). Only 24% of patients underwent elective PCI for chronic stable angina, all with either CCS class III or IV symptoms.

Sixty six of 88 of patients had multivessel disease, four had isolated left main disease, 33 had three vessel coronary disease, 33 two vessel coronary disease, and 18 single vessel coronary disease. Left ventricular function was impaired

**Table 1** Major adverse cardiac events

	In-hospital n (%)	30 days n (%)	1 year n (%)
Death	3 (3.4)	6 (6.8)	13 (14.7)
Myocardial infarction	0 (0)	1 (1.1)	4 (4.5)
Repeat PCI	2 (2.2)	2 (2.2)	1 (1.1)
CABG	1 (1.1)	0 (0)	0 (0)
Total	6 (6.8)	9 (10.2)	18 (20.4)

CABG, coronary artery bypass grafting; PCI, percutaneous coronary intervention.  
Myocardial infarction directly attributable to PCI was diagnosed by a twofold rise in cardiac enzymes.

(ejection fraction < 0.40) in 20 patients and eight had previously undergone bypass surgery.

A total of 123 lesions were treated. The strategy for revascularisation was percutaneous transluminal coronary angioplasty (PTCA) alone in 17 patients, PTCA and stenting in 68 patients, and direct stenting in three patients. Twenty nine patients underwent attempted complete revascularisation and 59 patients underwent target revascularisation of culprit stenoses alone. Abciximab was used in four cases only.

Procedural success was achieved in 76 of 88 patients with an in-hospital MACE rate of 6/88. Three patients died before discharge—two from cardiogenic shock which had been present before the intervention, and one from late sepsis. Other major complications included emergency bypass surgery in one patient, repeat PTCA in two, stroke in one, cardiac tamponade in one, and renal failure in one patient. Minor complications occurred in 30 patients and mostly included chest/urinary infections or femoral artery haematomas (n = 3). Major haemorrhagic complications did not occur in any of the patients before discharge. The median time from procedure to discharge was 2 (1–15) days.

Follow up data were obtained in all patients. The minimum follow up period was 120 days with a mean of 609 (391) days. The 30 day and one year MACE rates were 10% and 20%, respectively (table 1). The cause of death was definite myocardial infarction in six patients, congestive cardiac failure in two patients, presumed cardiac death in 10 patients, and non-cardiac death in two patients. In patients who died within 30 days of the procedure, five of six had had a recent myocardial, ejection fraction was < 0.40 in four of six patients, and PCI had failed in two patients.

Fifty two patients remained free of angina and did not require further hospitalisation. Twenty four patients experienced moderate to severe exertional angina (CCS II 13; CCS III

**Abbreviations:** CABG, coronary artery bypass graft; CCS, Canadian Cardiovascular Society; MACE, major adverse cardiac events; PCI, percutaneous coronary intervention; PTCA, percutaneous transluminal coronary angioplasty

12; CCS IV 2). Eleven patients were readmitted with unstable angina. In five cases repeat angiography was performed, with four proceeding to further PCI. No patients were referred for bypass surgery during follow up. Two patients had non-disabling strokes during follow up, and one patient had a non-fatal major gastrointestinal haemorrhage.

## DISCUSSION

The optimal management and indications for PCI in patients > 80 years presenting with acute coronary syndromes are not defined. The majority of patients undergoing revascularisation in this study had an acute coronary syndrome failing to respond to a prolonged trial of medical treatment. Despite their high risk, the initial clinical success rate was high and the vast majority of patients were discharged from hospital within 72 hours, relieved of their symptoms. During follow up 59% of patients remained free of angina and only 6% patients required readmission for chest pain. The procedural complication rate of 7% is higher than usual for PCI, but this reflects the extensive pattern of disease and may be no higher than the incidence of events with medical treatment alone.

Retrospective studies of revascularisation in octogenarians with chronic stable angina have reported higher in-hospital mortality rates (1.1–5.5%) compared to patients < 80 years.<sup>3,4</sup> However, the recent TIME (trial of invasive versus medical therapy in elderly patients) study in patients  $\geq$  75 years with chronic stable angina showed favourable results. There was a significant reduction of major adverse events in patients who were randomised to invasive versus optimised medical management (19 v 49%,  $p = 0.0001$ ).<sup>5</sup> Angina scores and measures of quality of life at six months were also significantly improved in the invasive group.

## IMAGES IN CARDIOLOGY

### Saphenous vein graft aneurysm presenting as an anterior mediastinal mass

A 63 year old man underwent coronary artery bypass grafting in 1995 from which he made an excellent recovery. In early 2000 he was admitted to hospital with a lower respiratory tract infection. A chest x ray taken at the time suggested a large anterior mediastinal mass. Subsequent computed tomographic scanning demonstrated a 10 x 10 cm mass in the anterior mediastinum, with calcification in the walls. This mass was not present in 1995.

Transthoracic and transoesophageal echocardiograms showed an anterior mediastinal mass compressing the right ventricular outflow tract, and colour flow Doppler demonstrated blood communicating with the mass

from the aortic wall, but the exact details of the mass were not clear.

Cardiovascular magnetic resonance imaging demonstrated a vascular mass(\*) in the anterior mediastinum (below left). The mass measured 10.6 x 9 cm in size (aneurysm starred, proximal graft arrowed) with signal intensity consistent with a mixture of thrombus and slow moving blood. There was significant compression of the aorta and pulmonary artery (below centre: Ao, aorta; pa, main pulmonary artery; lv, left ventricle). Maximum intensity projection reformatting of the magnetic resonance angiogram (below right) suggested the left internal mammary artery-left anterior descending artery (LIMA-

LAD) (long arrow) and saphenous vein graft-obtuse marginal (SVG-OM) (short arrow) grafts were patent, but displaced by the aneurysm. The signal intensity suggested flow in the proximal aneurysm, but no flow distal to the aneurysm. The left ventricular function was normal. There was septal flattening in diastole, suggestive of raised ventricular pressures.

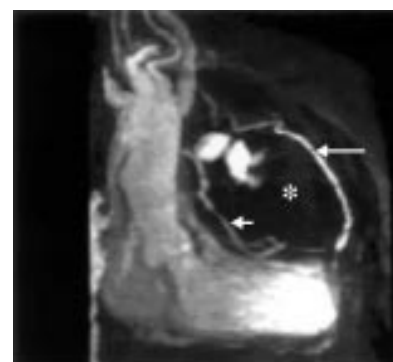
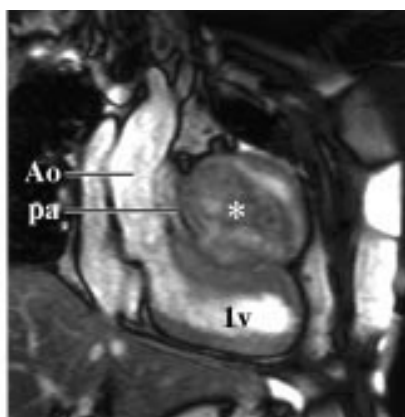
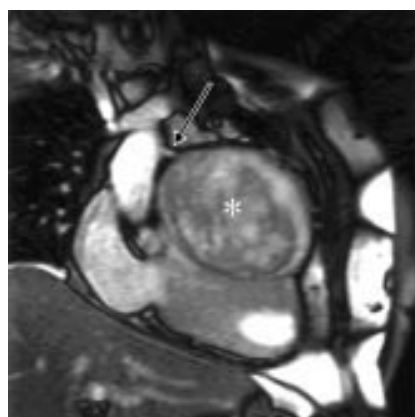
The patient has remained stable and is currently being conservatively managed.

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It seems appropriate to conduct a randomised controlled trial of early PCI versus prolonged medical treatment to determine the optimal management of elderly patients with acute coronary syndromes. A strategy of early PCI and rapid hospital discharge may be cost effective when compared with medical treatment.

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