Cardiac surgery in octogenarians and beyond

Should we do it, is it worthwhile, and who should decide?

In the Western world, the number of people living beyond 80 years is increasing. In the United States, it is expected that 43% of the population will reach the age of 80.[1] In Australia, men and women who reach 80 years may expect a further 7 and 10 years of life, respectively, the majority being disability free.[2]

Cardiac surgery in Australia has entered its fifth decade, and is now commonly performed (18 000 cases/year). The *total cost* (including salaries, equipment, building depreciation, etc) of having coronary artery bypass grafting (CABG) (which constitutes 75% of all cardiac surgery) at Western Australian teaching hospitals is about $12 000 per case (WA Department of Health, 1994, unpublished data).

Over the past decade, the proportion of cardiac surgery patients aged 80 years or more has risen from negligible to 7% in selected centres.[2-4] Surgical outcomes are encouraging: a 2002–03 report from six Victorian public hospitals revealed mortality rates of 2%–4% for elective CABG and 10%–12% for aortic valve replacement.[4] However, follow-up assessment by direct patient contact has not been universal — commonly, outcome analyses rely solely on physicians' perceptions.[2]

In a series of 64 octogenarians having cardiac surgery over a 5-year period at three Australian hospitals, our research group prospectively assessed outcomes and directly spoke to patients at several time intervals.[2] The need for surgery was compelling — all had class III/IV symptoms of angina and/or dyspnoea. The total in-hospital mortality was 6.3% (nil in those having elective surgery and 10.5% in those requiring urgent surgery). The incidence of significant complications was low (perioperative myocardial infarction, 1.6%; stroke, 1.6%). At a mean follow-up time of 2.8 years, 44 patients were still alive, 42 (95%) were free of cardiovascular symptoms, and 42 remained independent, with a significantly improved quality of life. Kaplan–Meier actuarial survival for hospital survivors at 4 years was 74%. Interestingly, 8 patients (18%) had remarried and 8 had commenced on sildenafil. Not surprisingly, 43 (98%) of the patients said they would recommend cardiac surgery.

Despite these favourable outcomes, one in five of the study participants had been originally advised by their general practitioner and/or physician not to proceed with surgery because of their age. Discrimination based on age alone is not uncommon.[1,5] Performing surgery in these octogenarians was on a needs basis — other patients on waiting lists were not disadvantaged. If people over a certain age are to be barred access to healthcare, it is for society to debate and for governments to legislate. In Australia, Katrina Bramstedt (a bioethicist at the Department of Community Medicine and General Practice, Monash University) has cogently argued that age discrimination is common. Yet there is no ethical justification for denying cardiac surgery to octogenarians,[5,6] particularly as empirical evidence validates the potential benefit of this treatment.[5] It has been stated that "survival is not the most important outcome in the elderly".[7] Not so. Of the 102 patients on whom we have now operated, all wished to continue to live independently.

So what have we learnt? Firstly, that surgery can be safely performed in octogenarians. The best people to make the decision whether to operate are the surgeon and the cardiologist, working in conjunction with one another. Secondly, that the success of surgery is critically dependent on the quality of anaesthesia and

postoperative intensive care. There must be ongoing clinical governance so that expected outcomes match actual results.[8]

Not only are more and more octogenarians choosing to have cardiac surgery, but the chances of a good outcome are improving. Advances in surgical techniques in recent years mean that the risks of cardiac surgery, for all patients but especially those over 80 years, have been substantially reduced. The availability of "off-pump" technology (ie, doing coronary artery anastomoses without the use of cardiopulmonary bypass [CPB]), including mechanical aortocoronary anastomotic devices, allows CABG to be done not only without CPB, but also without manipulating the aorta, thus reducing atheroembolic risk.[9] Furthermore, the duration of CPB and global myocardial ischaemia can be minimised by combining off-pump techniques with CPB (eg, valve replacement with CABG). Also, selective use of ventricular fibrillation (rather than cardioplegic arrest) when repairing a mitral valve avoids global myocardial ischaemia. Surgeons have several options for the technical performance of these operations. While there may be no surgical consensus on the optimal technique for a given patient, in my view a "one shoe fits all" surgical approach may prove hazardous.

It is important to prepare the patient optimally before surgery. This includes universal carotid screening and judicious use of prophylactic carotid endarterectomy, together with preoperative optimisation of renal function and maintenance of perioperative enforced diuresis.[10] Although none of these innovations has been tested in randomised controlled trials, myocardial, cerebrovascular and renal complication rates are now low.

A critical factor determining surgical outcomes is whether the patient is in need of urgent surgery (ie, surgery required as a hospital inpatient because the patient cannot be satisfactorily stabilised with medical treatment).[2-4] Delays in referring symptomatic patients are invariably associated with rapid clinical deterioration and poor results.

The role of percutaneous coronary intervention (PCI) versus surgery for coronary artery disease requires comment. Neither surgery nor PCI is benign.[11] For comparable patients of any age in experienced hands, the risks of inducing death, myocardial infarction, stroke or neurocognitive deficits are the same with either approach.[12,13] With surgery, the failure rate is lower and there is less need for repeat interventions. However, surgery requires a sternotomy and graft harvest incisions on the leg.

A number of clinical factors are associated with increased risk of PCI failure (eg, left main coronary artery or multivessel disease, diabetes).[14] Before PCI is undertaken, it is essential that the cardiologist and the surgeon carefully assess which procedure is optimal for a particular patient. If PCI fails, performing emergency surgery (ie, within 24 hours of hospital admission) is associated with markedly increased risks, particularly in octogenarians.

Which octogenarians should be offered cardiac surgery? Many, if not the majority, should be readily identifiable as unsuitable because of advanced comorbidities. However, the 20% of patients in our series who were advised not to proceed with surgery had no clear features distinguishing them from the 80% advised to proceed. It is impossible to provide unambiguous criteria for refusing surgery. Nor am I suggesting that all octogenarians be offered this treatment. What I am advocating is that age alone must not be a barrier to accessing cardiac surgery. We can be heartened that careful evaluation allows us to pick the right patients and that these patients are achieving acceptable outcomes. Patients should be offered a choice. Those who have had cardiac surgery believe it is worthwhile and are very grateful.[2]

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