

Is cardiac surgery now a geriatric specialty?

Samer A M Nashef

Among many national and international cardiac surgical registries, the United Kingdom cardiac surgical database¹ has shown a slow but steady rise in the mean age of the patient population treated. So, is cardiac surgery now a geriatric specialty? The question may seem flippant for two reasons: the first is that, at one end of life, cardiac surgery is in fact a paediatric or even neonatal specialty. The second is that there is probably nothing special about the changing age profile of cardiac surgical patients: many medical and surgical specialties can truly claim to have seen the mean age of their patients rise steadily. This is not surprising — many of the diseases faced by the developed world are degenerative conditions of old age. As medical treatment, anaesthesia and surgery progress, new treatments become available for previously untreatable conditions, and these treatments can be offered with an increasing safety margin to sicker and older people. In this respect, cardiac surgery is probably no different from any specialty that tackles degenerative disease.

Perhaps the most striking change in cardiac surgery emanates from the dramatic reduction in risk over the last four decades. When heart operations became possible, mortality was high. A heart operation would only be considered when symptoms were so severe, and prognosis so poor, that the effort and risk of the operation itself were considered worthwhile. This has now changed utterly: cardiac operations on the young and fit now carry so little risk that even asymptomatic patients with marginal prognostic benefits from surgery are prepared to go “under the knife”. At the other end of the risk–benefit spectrum, many heart diseases, such as left main or multivessel coronary disease and symptomatic aortic stenosis, have a genuinely bleak prognosis with medical treatment, so that the patient would have to be truly moribund not to benefit prognostically from surgery.

A further factor with a significant impact on the mean age of the cardiac surgical population is the recent exponential growth in interventional cardiology. Cardiologists have tended to “cherry-pick” patients in the earlier stages of coronary disease for perfectly understandable reasons: the patient with a limited number of short coronary lesions presents a more attractive prospect to the interventional cardiologist. By the time the stent options are exhausted, the disease has advanced, the coronary arteries sport a “full metal jacket”, and the patient is, of course, older.

ABSTRACT

Like all medical specialties that deal with degenerative disease, cardiac surgery is increasingly being offered to older patients. This is driven by longer life expectancy, an increase in the prevalence of degenerative cardiac lesions, a substantial improvement in cardiac surgical results and competition from interventional cardiology in younger patient groups. Although there is no agreed definition of “geriatric”, decision-making and the conduct of surgery and postoperative care in the elderly all require some modification of strategy to ensure the best results. Excellent outcomes can now be achieved (albeit at greater financial cost) in the older population, and these results hold well in the long term. Current trends suggest that both the provision and range of cardiac surgical services for the elderly may increase further. Despite this, there is still evidence of reluctance in considering older patients for cardiac surgery.

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Who are you calling geriatric?

At the beginning of my cardiac surgical training in Glasgow, Scotland, in 1984, the typical cardiac surgical patient was either a man in his 50s with coronary disease, or a woman in her 50s with rheumatic mitral stenosis. Patients in their 70s were a rarity. Gradually, the mean age rose to 60 years plus, and we were seeing an increasing number of septuagenarians. Now octogenarians having cardiac surgery are commonplace, and we recently reported results from Papworth Hospital, Cambridge, in 17 nonagenarians (Drain et al, Society for Cardiothoracic Surgery Annual Meeting, Manchester, UK, 2007). This is not unique. If “geriatrics” are those past retirement age, the specialty is now indeed largely geriatric.

To operate or not to operate?

A crucially important part of cardiac surgery in the elderly, as it is in any surgery at any age, is decision-making. This is a two-way process: the surgeon must decide whether there is indeed an indication for surgery based on a careful analysis of the balance of risks and benefits; having determined that the indication exists, the surgeon must offer this information to the patient, who then

decides whether, in his or her view, the benefits outweigh the risk.

We cannot foresee the future, and can never know whether a patient will survive or succumb to an operation, but we do have risk models which can calculate the probability of survival, and we are able to adjust their prediction according to the performance of the institution and the surgeon contemplating the operation. Calculating the risk on that basis is relatively straightforward. The benefits are a little harder to work out.

The symptomatic benefits can only be assessed by the patients themselves: after all, it is they who are breathless or have angina, and it is only they who can determine the impact of these symptoms on their life, and how much that life is likely to improve if the symptoms were effectively eradicated.

The prognostic benefits can be assessed by subtracting the risk of surgery from the risk of medical treatment alone. Often the answer is a positive benefit in favour of surgery, but it has to be remembered that the risk of surgery is taken immediately or "upfront", whereas the risk of medical treatment, based on the natural history of the disease, is spread over the months or possibly years to come. This is particularly important in the elderly: if one's life expectancy is only 2 years, one is unlikely to wish to embark on a surgical option which will bring a prognostic advantage that becomes statistically significant in 5 years' time! Operating on purely prognostic grounds in the very old can be difficult to justify in many cases, and it is preferable and more rewarding, where possible, to offer the elderly operations that will make them feel better, rather than make them feel initially a lot worse so that they, in due course, may live longer.

There is a final caveat before embarking on cardiac surgery in the elderly on purely prognostic grounds: the value of prolonging life is perceived differently by different people, and the contrast may be more marked in older patients. An 80-year-old with aortic stenosis may say: "I've lived long enough, my wife died 2 years ago, I am tired, have little to live for, and I certainly do not want to be undergoing major operations at my time of life". Whereas another may say: "I aim to see my 100th birthday and plan to climb Mount Fuji before then, and I do not care what risk I take as long as it gives me a chance to achieve these aims". The patient's own perception of the value of prognostic benefit must be taken into account.

Perioperative care

Although some elderly patients presenting for cardiac surgery are the biological elite, perfectly fit but for heart disease, it goes without saying that many have suffered

the ravages of time and have comorbidities which must be taken into consideration in managing the operation and postoperative care. Detailed operative and intensive-care plans are beyond the scope here, but, as a general principle, the elderly do best if they go through the cardiac surgical unit "without touching the sides". Expedious, careful surgery and a course without complications are of course desirable in all patients, but never more so than in the elderly: they are often fragile and poorly tolerate long bypass times, major haemodynamic upsets and postoperative bleeding. They do not improve "on keeping" in the intensive care unit: prolonged ventilation and haemofiltration are not particularly desirable. Sensible conduct of the operation and early postoperative care should aim to avoid the need for such invasive interventions.

Outcomes

It is now well established that cardiac surgery in the elderly can be performed with acceptable mortality and morbidity. Recently, we showed that the benefits of surgery in the over-80 age group were preserved in the long term, with the somewhat surprising finding that long-term survival was significantly better in the cardiac surgery patients than in a general population with the same age-sex distribution.² The difference was striking — survival rate at 5 years, 82.1% v 55.9% ($P < 0.001$). Of course, an important component of this survival advantage must be due to case selection: if only the fittest are referred for surgery in the first place, one would expect them to live longer. An additional, though not alternative, explanation is that cardiovascular disease is the biggest killer in the developed world; fixing the cardiac lesions must therefore neutralise some of the impact of that risk. Furthermore, in another study of patients with aortic valve disease, we found that the elderly were somewhat excessively represented in the urgent and emergent surgery subgroups, despite strong evidence that the diagnosis had often been established months, if not years previously. This would suggest that there is still reluctance on the part of patients and their referring physicians to consider cardiac surgery until decompensation occurs, and there is no choice left. It is interesting that patients considered too old and unfit for *elective* surgery suddenly become young and fit enough when they go into heart failure! This would suggest that the above-mentioned selection of patients for heart surgery is not quite as judicious as some would like to think.

Operating on the elderly is expensive. Although the results are acceptable and bear comparison with those in younger age groups, there is no doubt that morbidity is

greater, ICU and hospital stay are longer, and resource use is greater.³ As mean patient age increases, provision will have to be made for more resources and better reconfiguration of the provider system to cope with the workload.

The future

Currently active areas of development in the specialty include minimally invasive approaches to coronary and valve disease, novel interventional approaches to the treatment of atrial arrhythmias, and hybrid (surgical and interventional) approaches to all of the above, as well as to diseases of the thoracic aorta. All of these are likely to increase the range and availability of cardiac surgical treatment in the elderly.

Regardless of the developments in catheter-based intervention, the elderly will probably represent an increasing proportion of the cardiac surgical workload. This will have an impact on the decision-making process and the strategies for care delivery, both clinical and managerial.

Conclusion

Cardiac surgery is, to some extent, undoubtedly a geriatric specialty now. Perhaps it is even not geriatric enough!

Author details

Samer AM Nashef, Consultant Surgeon
 Papworth Hospital, Cambridge, UK.
 Correspondence: sam.nashef@papworth.nhs.uk

References

- 1 Keogh BE, Kinsman R. Fifth national adult cardiac surgery database report 2003. London: Society of Cardiothoracic Surgeons, 2004.
- 2 Stoica SC, Cafferty F, Kitcat J, et al. Octogenarians undergoing cardiac surgery outlive their peers: a case for early referral. *Heart* 2006; 92: 503-6.
- 3 Scott BH, Seifert FC, Grimson R, Glass PS. Octogenarians undergoing coronary artery bypass graft surgery: resource utilization, postoperative mortality, and morbidity. *J Cardiothorac Vasc Anesth* 2005; 19: 583-8. □



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