

Editorial

**CORONARY BYPASS SURGERY IN ASIANS:
A BATTLE AGAINST A RACIST ENEMY!**

'Having practiced cardiovascular surgery for over 25 years, I have come to the conclusion that each current case brings with it relatively more risk and less benefit for me than when I began practicing my specialty.'
...Cary W Akins

Dr. Cary Akin is a big name in the field of cardiac surgery and he recently made these comments in discussion forum of CTS-Net¹. Most of the times, in scientific meetings we as surgeons present our experience with new techniques and technologies. Almost always, we present stories of our success and leave the meetings with a sense of achievement and a renewed confidence that 'all is well'. On the contrary Dr. Akin's above-mentioned comments are very unusual and deserve a very serious thought. In fact, I must confess that the Asian surgeons do not have to wait for 25 years to develop this feeling of futility; we reach this conclusion in less than 25 months!

The pattern of ischemic heart disease is changing very rapidly in the whole Asian region. The disease presents in a much more advanced and complicated form. What worries me the most is the fact that preventive cardiology is the most neglected area in the developing countries. It is a paradox that in almost all poor as well as developing Asian countries, one can easily find state-of-the-art centers of cardiac surgery and interventional cardiology, but it is rare to find any organized concerted efforts for prevention of this disease. This is a very unfortunate example of the failure of modern healthcare systems, which are ignoring much cheaper preventive policies, and have perhaps allowed too much influence from multinational cartel of biomedical engineering in research and development.

With the development of modern stents, the number of patients who are technically operable is steadily declining. Figure 1 shows the decisions taken in the weekly joint cardiology-cardiac surgery meetings in our unit. Similar trends have been noticed in the developed countries. In a recent article, Ferreira et al have reported a nearly 21% decrease in the volume of coronary bypass surgeries after arrival of medicated stents.² They also mentioned that these days the indications for CABG are left main stem

disease, need for concomitant valve surgery and chronic total occlusion of coronary arteries. Most of the classical indications for CABG are no more valid in the presence of modern stents. I welcome the role of interventional cardiology in relieving human suffering. However, what alarms me the most is the fact that the patients left for surgical revascularization generally have higher risk of mortality and morbidity and eventually have a less favorable short- and long-term outcome. As a matter of fact, in this region we are noticing a rising number of inoperable cases. Since surgeons are not just technicians, it is our responsibility as members of the doctors' community, to provide the important feedback when 'all is not well'.

It is justifiable to question whether it is correct to make any generalized comments about the whole Asian race. In more simple words: Is there any Asian race? Asia is a very wide geopolitical area and therefore has a lot of ethnic, cultural and religious diversity in it. A leading article in the December 2003 issue of Scientific American deals with a similar question.³ The article summarizes the astonishing observations made by experts in genetics that human beings can be easily classified into five categories on the basis

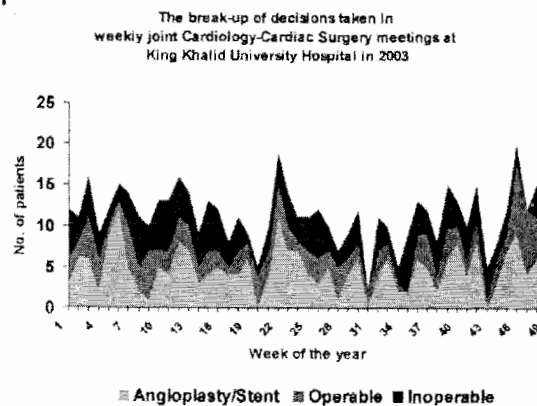


Figure 1.



of their genetic code. These five categories conform very well with the geographic continents. The Asian region has two sub-groups living on the eastern and western sides of the Himalayas. In addition to these genetic clues changes in life styles are similar in the whole region. Since ischemic heart disease is a multifactorial disease, there are enough direct and indirect reasons that the behavior of ischemic heart disease is similar in the whole Asian region.

In contrast to the epidemic rise in mortality from coronary artery disease prior to the 1960s, the death rate is declining in most industrialized countries, except in Eastern Europe where trends remain upward.⁴ In the UK, USA and Australia the mortality from coronary artery disease reached a peak in mid-60s and then started declining to reach pre-World War II levels in mid 70s.⁵ This is a strong evidence of the effective role of primary prevention by increasing public awareness. On the contrary, the incidence of ischemic heart disease is increasing to epidemic proportions in the developing countries of the Asian region. It is therefore not a surprise that in India the death rate from cardiovascular causes has increased from 4% in 1960 to 50% in 1990 and in the Middle East 25-50% of all deaths are currently due to cardiovascular diseases.^{4,6}

The statistics from the developed countries have shown that Asians living in the western countries have a much higher incidence of diabetes.⁷ Estimates of the increase in diabetes are alarming. In the period from 1995 to 2025, it is estimated that the rise in diabetes will be 68% in China, 59% in India, 30% in the Middle East and 40% in Asia as a whole.⁸ Since diabetes is the main risk factor for coronary artery disease in Asians, the disease pattern is entirely different from the western world. It is therefore not just a matter of performing bypass surgery. The complicated issues surrounding the operation due to diabetes demand a different level of understanding as well as technical expertise. Perhaps Asian surgeons need a different skill set to produce satisfactory results. Unfortunately, most of the time when we think of diabetes, we think of hyperglycemia and spend most of our time and energy on controlling the blood sugar level. We tend to underestimate the role of diabetes in causing dyslipidemia, hypercoagulability and mediation of generalized inflammatory response.⁹⁻¹¹ All of these factors are responsible for the failure of our bypass grafts and as a surgeon we should always be very scrupulous

about modifying these risks after surgery. We tend to overlook the importance of lifestyle changes aimed at regular exercise and weight reduction in obese type-2 diabetics. These lifestyle changes significantly improve the endothelial function and may prolong the life of bypass grafts.¹²

Coronary bypass operation itself has become a highly standardized and reproducible procedure in the developed world. Even in the developed nations the outcome of coronary bypass surgery is less favorable in patients of Asian origin.¹³ Coronary artery bypass surgery in the Asian countries is therefore still a challenging experience. The diffuse nature of the disease, poor compliance with medical advice and multiple co-morbidities due to diabetes, obesity and smoking, demand a lot of lateral thinking while tailoring the best treatment strategy. It is difficult to apply all the basic principles laid down by the experts working in the developed countries. Asian surgeons have failed to develop their own risk assessment systems and the systems imported from the developed world still need to be validated for Asian communities. Consequently, it is very difficult to provide any guidelines for young coronary surgeons who are keen to do evidence-based practice. It is becoming even more difficult to train young surgeons locally. Our experience, as well as reports from other centers, show a very high incidence of diabetes, hypertension, and smoking among Asian patients undergoing coronary artery bypass.¹⁴⁻¹⁷ The incidence of renal failure and peripheral vascular disease is also rising. These risk factors combined with diffuse nature of coronary artery disease and poor ventricular function leaves no degree of freedom for errors during surgery. In these circumstance training becomes a lengthy, tiring and unexciting job. Since the glamour and monetary advantage of this specialty are already waning very rapidly, it will not be a surprise if in the future we fail to find young doctors interested to take this specialty as a career.

In Figure 2, I have listed a few important tips for young coronary surgeons working in the Asian region. These tips are based on my personal experience as well as the experience of many other colleagues who have watched the whole gambit of coronary bypass surgery in Asian patients. Many of these points are based on indirect evidence gathered from the western countries. As I mentioned above, Asian surgeons need a different skill set for producing good results. For instance, endarterectomy



1. Poorly visible vessels can still be graftable.
2. Endarterectomy with/without an on-lay patch can be life saving.
3. Per-operative measurement of graft flow is vital.
4. Do not hesitate to add or revise a graft.
5. Learn all the minute details of whatever method of myocardial protection you use.
6. Off-pump and On-pump-beating techniques provide superior myocardial preservation.
7. Avoid using fibrin glue near anastomosis.
8. Use more arterial and sequential grafts.
9. Start antiplatelet therapy as soon as possible after grafting.
10. Read the discharge letters yourself to ensure that the patient has been prescribed statins, antiplatelets and other measures for secondary prevention.

Figure 2. Ten Commandments for Asian Coronary Surgeons

is not a common practice in the developed world, but Asian surgeons may have to do it frequently. In fact, when applied properly it may be very rewarding and at times, a life-saving maneuver.¹⁸⁻²² Similarly, the surgeon should develop expertise in interpreting the angiogram. Many diffusely diseased vessels may be poorly visualized on the angiogram but turn out to be graftable during surgery.²³ At King Khalid University Hospital we strongly advocate intra-operative measurement of graft flows.²⁴ Before the availability of flow measuring devices, whenever there was unsatisfactory cardiac function immediately following grafting, decisions were based merely on the speculations of the operating surgeon. Now if we encounter an abnormal ECG, haemodynamic instability or new segmental wall motion abnormality, we correlate it with the graft flows. We have always found it very useful to identify the exact cause of these abnormalities and we do not hesitate to revise or add a new graft. This policy has been highly rewarding and many other centres in the world have reported a similar experience.²⁵ On the basis of this experience I believe that early graft failure is almost always due to technical reasons and should be corrected before the patient leaves the operating room. Since most patients present with poor ventricular function, my advise to Asian surgeons is to master the details of their chosen technique for myocardial preservation. There is enough evidence available in the literature confirming the benefits of off-pump coronary bypass surgery in high-risk patients especially those with poor left ventricles.²⁶⁻²⁸ We are convinced of the benefit of both off-pump as well as on-pump beating technique in poor ventricles

and we have shifted to these techniques, avoiding cross-clamp and cardioplegia. The use of fibrin glue to control bleeding points near anastomoses has the potential danger of graft occlusion and after witnessing problems I strongly recommend avoiding it. Since most of the Asian coronaries are small in size and the diffuse nature of disease limits the distal run-off, surgeon should learn and frequently use sequential grafts. Sequential grafts are known to have better long-term patency.²⁹ Lastly, it is needless to emphasize the importance of secondary prevention by prescribing statins, antiplatelet medications and ACE inhibitors in proper dosage. Trials have proved the beneficial role of statins in the long-term patency of vein grafts.^{30,31} Similarly there is strong evidence that antithrombotic agents prevent early graft failure.³² and one should start aspirin as soon as possible on the day of operation.³³

In summary, all is not well in the field of coronary artery surgery in Asia. Coronary bypass grafting, which is perhaps the most wonderful operation and has provided a new lease of life to millions of people in the last 30 years, is losing its benefit rapidly in this population. Its scope is becoming more and more limited to symptomatic relief of angina. All improvements in skills and technology have helped to reduce the operative mortality only. The lack of organized efforts on the preventive side has progressively reduced the prognostic benefit of this operation. The time is running short and if the Asian communities fail to appreciate the gravity of situation, this rare breed of overworked and unsatisfied coronary surgeons will soon find themselves unable to help large number of patients suffering from



intractable angina and impending death. Indeed most of these unfortunate patients will be 'inoperable' by current standards of practice.

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