The dilemma faced by a budding cardiothoracic surgeon in India—a first hand account

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Abstract

Cardiothoracic surgery is undoubtedly one of the most glamorous and exciting surgical fields on earth. The field requires passionate and hardworking youngsters who are always willing to learn. Bright young surgeons should know what is going to be on their platter once they have decided to take the plunge into cardiac surgery. This article is a fruit of my 3 years of residency experience and my ongoing stint as an assistant professor. In this article, I have tried to make young surgeons aware of what they will face during their residency tenure and also to attend to some of their worries prior to selecting cardiac surgery as a career option.

Keywords Cardiac surgery · Cardiac surgery residency

Cardiothoracic surgery was, unlike many of my peers, my choice of a career even before I entered post graduate studies. Back in 2009, as an undergraduate student, I had participated in a special examination in cardiology, consisting of multiple choice questions and three cardiac case presentations. I trumped it. Since then, matters related to the heart always found a very inquisitive student in me.

Coming to cardiothoracic surgery, admission was fairly smooth; though, it actually involved a lot of conflicts with friends and family. I am sure many of the budding cardiac surgeons might face the same. Sad to say, but one of the most beautiful and intricate surgical specialties on earth is being neglected based on hearsay and rumours. My aim, here, is to encourage the young surgeons to join this profession. And I shall execute it by a simple counter the rumour method.

Rumour 1: Cardiac surgery needs too much of an investment on the family front with very little returns; family life needs to be sacrificed.

Truth: Which surgical branch does not? The learning curve is indeed tougher than the other surgical streams, but any surgical stream for that matter would not give returns with a suboptimal investment.

A. Considering the number of surgeons mushrooming up in other specialties, a young surgeon needs to be extraordinary to survive the race and be a worthy contender. Contrary to that, in cardiac surgery, the learning curve deters people from joining, so the competition is less. As stated by Burt et al., increasing years of surgeon experience is associated with improved operative efficiency and long-term survival in valvular cardiac surgery [1]. A prolonged learning curve leads to a slow reduction in operative timings, which in turn has a detrimental effect on the prognosis of the patient [2].

And now, the pertinent question:

Does family life need to be sacrificed?

It might be safe to assume that the sheer magnitude of work and its finer intricacies are best understood by the surgeon and by no second person, unless the latter is properly trained. So the onus is on the surgeon to enter a detailed discussion with his family members, explaining the nature of the work, and the importance of staying back in the hospital on some occasions. Hours can be erratic, and late nights and next mornings are commonplace.

Rumour 2: Cardiac surgery is a dying specialty.

Truth: Not at all. In fact, I was advised by a consultant neurosurgeon to go for Cardiovascular and Thoracic Surgery, as the cardiologists' dominance had come a full circle by 2013–2014. Newer ways of approach have been imbibed in some

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parts of the world wherein the interventional cardiologists and the cardiothoracic surgeons work in synchrony, the so-called Heart Team [3].

The management modality of ischaemic heart disease with multiple vessel occlusions, as it stands now, is an option between quick relief from symptoms, with the risk of disease relapse, in the form of stenting (percutaneous coronary intervention), or in the form of coronary artery bypass grafting.

Catheter-based techniques have succeeded in grabbing a major slice of the pie. However, the age-old debate continues with respect to the superiority of percutaneous coronary intervention (PCI) versus coronary artery bypass grafting (CABG). CABG is by no means obsolete, as proved time and again by trials such as SYNTAX (Synergy Between Percutaneous Coronary Intervention With TAXUS Drug-Eluting Stent and Cardiac Surgery, 2009) which concluded that CABG demonstrated fewer major adverse cardiac and cerebrovascular events compared with PCI [4]. In 2018, 5-year data from the SYNTAX trial and other similar randomized studies (11 randomized trials involving 11,518 patients) comparing PCI with CABG for complex coronary artery disease were assembled and meta-analysed. All-cause mortality was found to be significantly higher in PCI compared with CABG [5]. As of 2019, the SYNTAXES (Synergy Between Percutaneous Coronary Intervention With TAXUS and Cardiac Surgery Extended Survival) trial, which is a 10-year follow-up study of the SYNTAX trial, has shown that patients with three-vessel disease had a survival advantage with CABG versus PCI at 10 years. Also, all-cause death at maximum available follow-up was 18% more in PCI compared with CABG [6]. So as we follow the patients longer, the benefit of the surgery gets larger.

Even the latest generation of drug-eluting stents may impair coronary vasomotion, trigger neoatherosclerosis and hamper surgical attempts to treat failed stented segments [6]. Bioabsorbable vascular scaffold (BVS) had been specifically developed to reduce late adverse events after coronary stenting, such as device thrombosis, but, the evidence shows that in select patients they are non-inferior with a trend toward being inferior [7]. A multitude of case reports have been published over the past 5 years that imply the unreliability of the BVS, leading to restenosis and severe symptoms after one and a half years on an average, after the stoppage of dual antiplatelet therapy [8–10]. Hence, the demand for BVS has gone down drastically.

Now my message for the trainees, do not stop at traditional open surgeries only. That's just the tip of the iceberg. As more and more centres adopt minimally invasive surgeries as standard, the trainees should aim to have adequate exposure in minimally invasive direct coronary artery bypass (MIDCAB), endoscopic atraumatic coronary artery bypass (Endo ACAB), total endoscopic coronary artery bypass (TECAB) etc. There are transcatheter aortic valve implantation (TAVI),

transcatheter mitral valve repair (TMVr), transcatheter mitral valve replacement (TMVR), robotic surgeries, surgeries for heart failure and arrhythmias and transplants.

However, it should be mentioned in this context that there is no information about the long-term results of minimally access surgeries, unlike the tried and tested median sternotomy approaches. Though these are very popular in countries like India, we are still not aware of the reoperation rate, e.g., after mitral valve repair through mini thoracotomies. We know today, for sure, that off-pump coronary artery bypass grafting (OPCAB) has not sustained the test of time (10 years) against on-pump surgery, though as a short-term solution it might look good against PCI.

And paediatric cardiac surgery is a different story altogether. The playground is open!

Rumour 3: The subject is very difficult.

Truth: Indeed it is, but albeit a mesmerizing one. It takes time to understand and imbibe the concepts, but once they are thoroughly incorporated in your system, one cannot stop exclaiming about how beautiful it is. And it has a fascinating history that documents the risks and failures that the great stalwarts of the subject had to face, in order to shape it into a safe and convenient management modality, as it is now. For the young aspirants, I would advise them to be confident about their anatomy, as that is half the battle won. The initial experience is difficult, but as you go deeper you would find that a bit of concentration and passion would help you go a long way. The heart needs passionate people to know how beautiful it really is.

What do you need to learn?

Well, a lot of surgical skills and handling techniques. During the learning curve, things need to be learnt that are considered to be the domain of anaesthesiologists; viz., drug doses, inotrope administration, ventilator settings, extubation techniques, reading electrocardiograms and pulseoximeter wave forms etc.

Rumour 4: Mortality is high.

Truth: This is a critical topic. So I would like to break it up into segments.

- (a) The mortality may be higher on paper compared with other surgical fields if the numbers are considered. The young surgeons might get to hear time to time from their peers in other specialties about the heightened mortality rates in cardiac surgery. But they should be aware that no two surgical field is the same, and hence, a fair comparison is impossible. Let us examine a case in point. In neurosurgery, for example, the patients who undergo extensive surgeries for intracranial bleeds or a large tumour may have

devastating post operative sequelae with a low Glasgow Coma Scale Score (GCS), though they cannot be registered as mortalities. The knowhow about inotrope use, drug dosages, ventilator settings and extubation techniques helps. Post cardiac surgery patients require intensive monitoring, judicious use of cardiovascular drugs, effective pain control, early mobilization and intensive respiratory therapy, for reduction in mortality. According to our institution protocol, the post-operative patients would entirely be managed by us, as there is no cardiac anaesthesiologist. This protocol, however, changes from institution to institution, when there are full time intensivists or cardiac anaesthesiologists. I implore all the young surgeons to observe the post operative management intently, as it has as much implications on the prognosis of the patient as the surgery itself.

(b) How much is too much?

A perseverant and tenacious attitude is essential, and this has to be exercised efficiently in extreme conditions of fatigue and frustration (sometimes), year after year. A clear head, reactive to the importance of a situation has to be nurtured, to safely tide over stormy post operative periods. The rush you get, when your patient walks home, comfortable, is beyond words. All the frustration and sleepless nights finally feel worth it.

Rumour 5: The surgeon's job is confined to the theatre.

Truth: That and much more. Operating is only half the job done. For youngsters, the onus is on them to ensure that the operated patient has a safe post operative course. The trainees are required to spend the entire post operative period in the intensive care unit (ICU) till the patient is extubated and even more. This helps them understand the progression of the patient.

Rumour 6: Settlement takes time, when peers in non medical streams may be at their pinnacle of glory, we are just exiting the training programme.

Truth: Hands on experience is a bit guarded than most of other specialties. That's understandable, as the handling of the heart takes years to master. And in cardiac surgery, it is always life or death. The settlement as a senior consultant takes time, but that again is also dependent on the individual's skills. After a decent settlement, the remuneration is right at par with other superspecialties and sometimes even more.

Frustration may creep in sometimes, when peers in non medical streams settle early and have a complete family by thirty. I believe that a select personality trait helps people be surgeons; and that trait shall help the youngsters hone their skills further. I had joined chemical engineering before joining medicine, and trust me that was not even half as exciting as

this is. The daily adrenaline rush compensates a long way, for the loss of material pleasures.

Rumour 7: No social life or time for extracurricular activities.

Truth: I might sound biased as I am from within the fraternity. However, it is true that some of the most dynamic individuals I have met in my life are cardiac surgeons. They do have an active social life. It is all about having the right mindset, about how to balance work and leisure.

Rumour 8: The Chief latches on to his/her post, doing a major chunk of surgeries, thus proving it difficult for upcoming surgeons to gain access to more hands on training.

Truth: Perseverance, perseverance and perseverance! This is the keystone for gaining inroads into the department and into the heart of the chief. Do not forget that they have gone through sufficient hardships to gain this position. I must say that, even though a Government approved and monitored protocol-based training in India is still a few years away, a measured approach with an eagerness to operate gets its due reward. I was lucky to be in an institution where all of us residents received substantial hands on training. That might not be the case with everyone. Be disciplined and persistent, and maintain a down to earth demeanour. Never lose hope, never!

To sign off, a few other points I would like to mention:

1. Interpersonal relationship and leadership qualities are vital. You should be able to work in a team with your peers and lead a team in situations of duress, and a cordial relationship with the chief and nursing staff should be maintained at all costs. It is important to counsel the patient's family about a surgery that is a potential life saver, but could be fatal too.
2. Immense patience is required to channelise the adrenaline, else ominous mistakes could occur on table.
3. Do not let frustration get the better of you. Talk to your parents and loved ones. Family support is essential to tide through this time.

It can be a jolly ride, when challenges become commonplace. Dealing with the heart takes a lot of heart. Challenges should not be a deterrent, as at the end of the day, do not we all love a bit of them?

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