

OFF-PUMP CORONARY ARTERY REVASCULARISATION TREND IN KARACHI: A LOCAL SURVEY

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ABSTRACT

Purpose and Setting: A survey of local cardiac surgeons was carried out to know their views about off-pump coronary bypass surgery (OPCAB).

Methods: A questionnaire was developed and all the local cardiac surgeons, who were either consultants or in waiting, were approached and requested to provide required information. This information was accepted as it was and tabulated to see the trend

Results: Twenty one surgeons were approached. Nineteen surgeons were involved in coronary bypass surgery. OPCAB was performed by all with a varying frequency. Majority of surgeons felt that OPCAB was more difficult and the anastomosis not as accurate. They however felt that the procedure was beneficial for high risk patients. It was almost unanimous that off-pump technique was difficult to pass on to the trainees

Conclusion: OPCAB was performed by all the cardiac surgeons, doing coronary surgery, in Karachi. The practice is however not regular. This probably is due to not availability of avenues for CME locally. This would discourage surgeons to pass on the skill to the trainees and the interest may dwindle completely in future.

Key Words: Coronary Bypass Surgery, Off-pump CABG, Training in OPCAB

INTRODUCTION

Coronary artery bypass grafting on beating heart (OPCAB), in the last few years has gained a wide popularity as an alternative to conventional myocardial revascularisation in the treatment of coronary artery disease and is currently being performed by many surgeons world wide^{1,2}. The use of cardiopulmonary bypass (CPB) and cardioplegic arrest allows the optimisation of the surgical field and consistent placement of grafts. However, it is associated with significant dysfunction of major organs (lungs, kidneys, brain) and coagulation

abnormalities as well^{3,4}. Studies have shown that off-pump coronary artery bypass (OPCAB) surgery is effective, safe and exhibits excellent short- and mid-term results and minimal morbidity^{5,6}.

OPCAB technique offers some advantages over conventional CABG and that a continuation of this approach is justified. The potential clinical advantages of OPCAB and the advances made in surgical technology have made this procedure an essential part of a cardiothoracic training program. However, several questions and concerns may arise as to whether and to what extent, coronary artery grafting without the use of CPB should be considered an integral part of the education in cardiothoracic surgery for the current trainees⁷.

MATERIAL AND METHODS

A simple questionnaire was developed and circulated among local surgeons. Identity of the respondent was not accounted. Surgeons were requested to fill-in the

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Table I

<i>Discouraging Factors for Off-pump CABG</i>	
<i>Factors</i>	<i>No. of surgeons agreeing</i>
Risky for patient	5
Anastomoses performed were inaccurate	5
Haemodynamic instability during cardiac positioning and manipulation	6
Longer duration of operation	4
Technically more difficult	8
Excess blood loss	None
Anaesthetist's lack of co-operation	2
Not comfortable in reusing a stabilizing device without gas sterilisation	1

Figure I

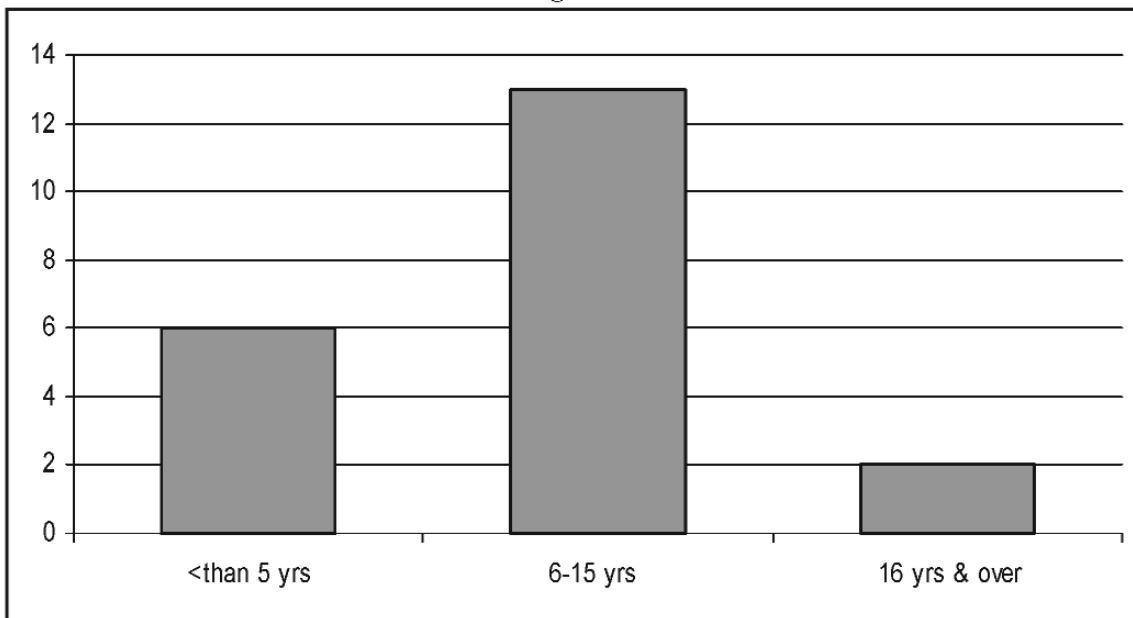


Figure II

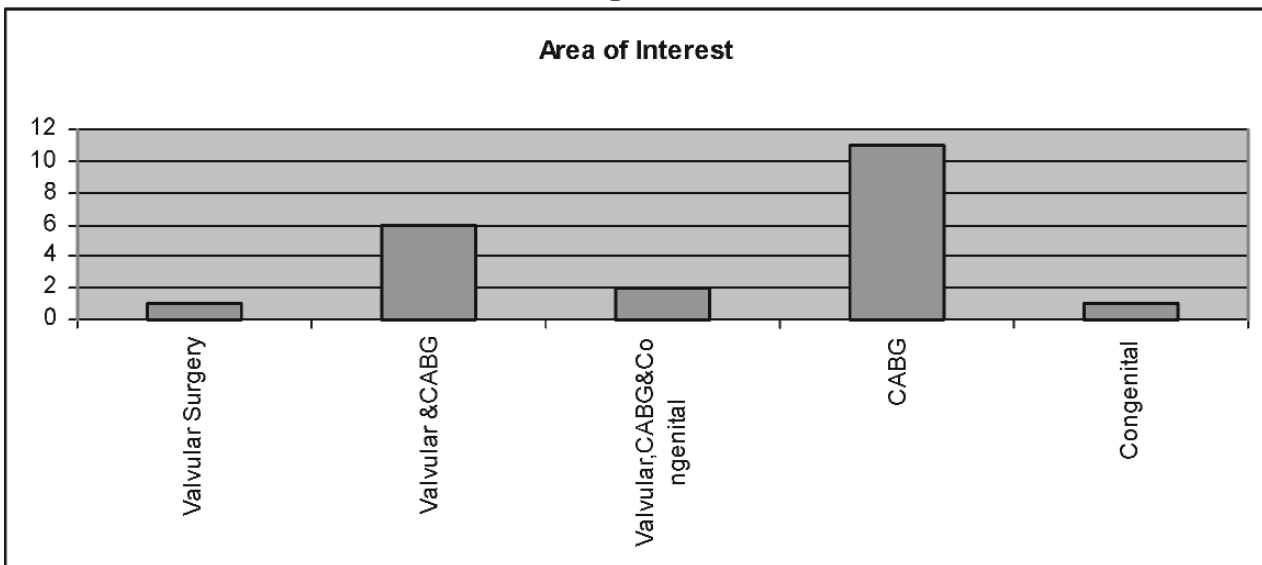


Figure III

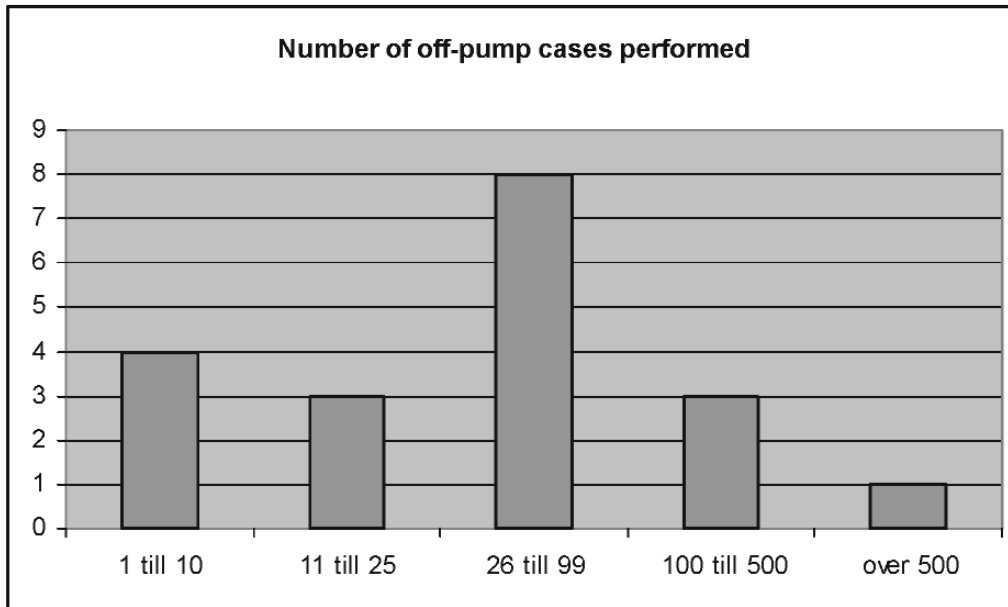
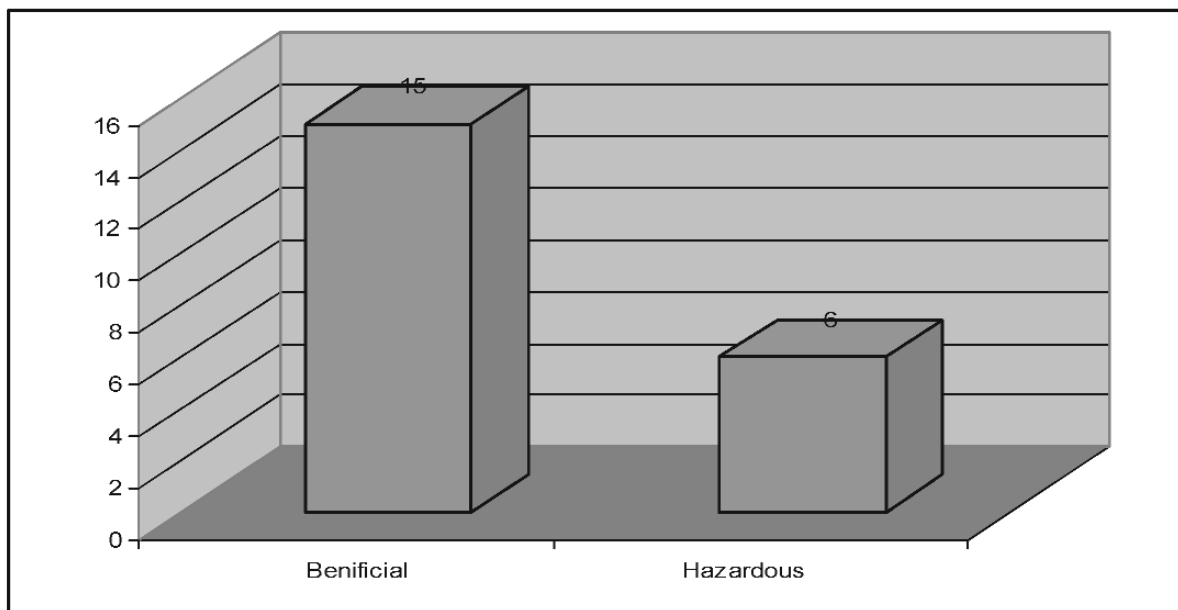


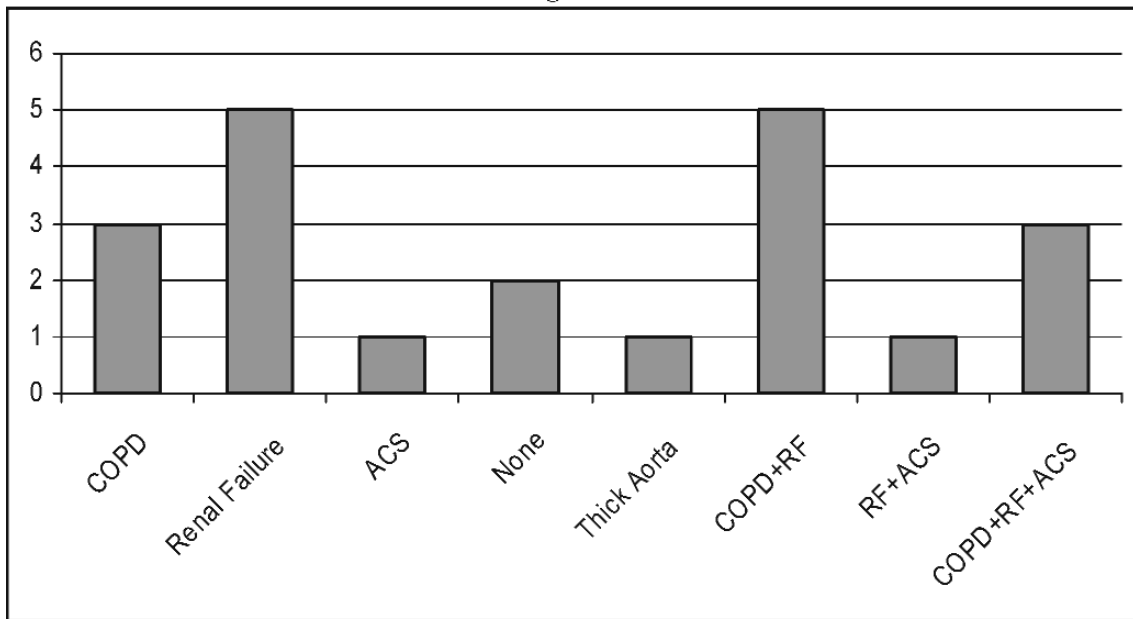
Figure IV



questionnaire; none of the information provided was disputed. Questions asked were number of years practicing as consultant. Major area of surgical interest: between coronary, valvular, and/or paediatric surgery. Did they ever perform off-pump CABG surgery. Which procedure between off-pump or conventional on-pump were they more comfortable. If they did not prefer off-pump surgery, what was the possible reason; a) risky for patient, b) anastomoses

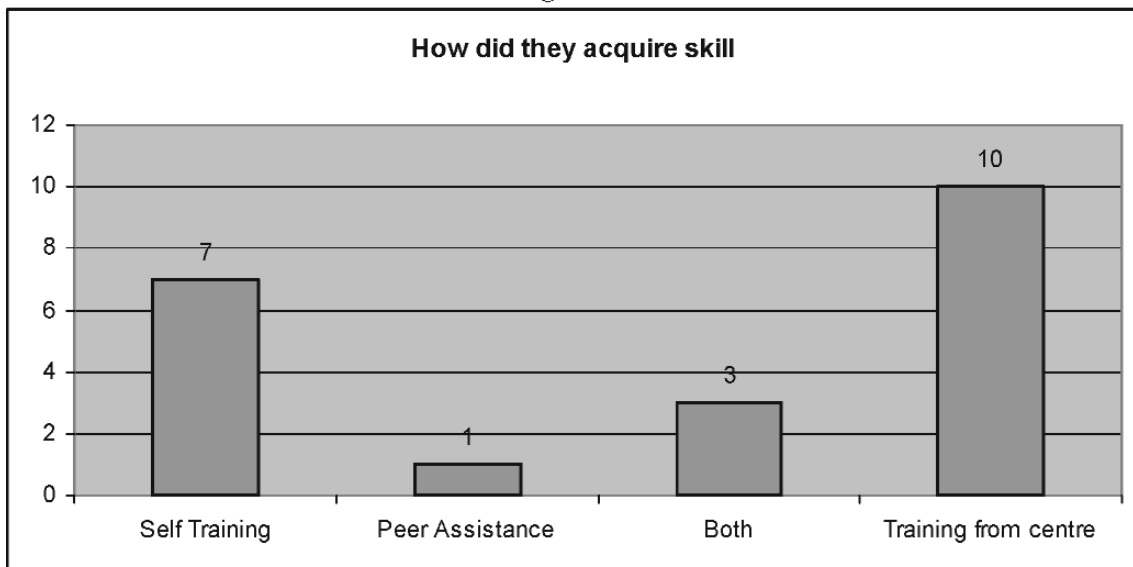
performed were inaccurate, c) it caused haemodynamic instability during cardiac positioning and manipulation, d) it took longer to perform the operation, e) they found it technically more difficult, f) there was excess blood loss, g) anaesthetic co-operation was lacking, h) they were not comfortable in reusing a stabilizing device without gas sterilisation. They were asked; how did they learn the technique. Was off-pump CABG beneficial at all for

Figure V



Co-morbid conditions where off-pump has clear advantage

Figure VI



patients with acute coronary syndrome, renal compromise, and obstructive airway disease? Should off-pump CABG replace conventional approach? How often did they do off-pump surgery, and which vessel did they find difficult to graft. Lastly how do they feel about training junior colleagues.

RESULTS

Altogether 21 Karachi based surgeons were approached. They were divided into three groups;

new surgeons with independent operating for 5 years or less (N=6), experienced surgeons with independent operating of 6 to 15 years (N=13), and seasoned surgeons with independent operating of 16 years or more (N=2) (Fig I). Nineteen surgeons had interest in coronary surgery, one exclusively performed paediatric surgery, while another was interested in valvular surgery (Fig II), these surgeons also opined on the subject and were therefore included. All surgeons performed off pump CABG at least once. The number of cases given by the surgeons was not

Figure VII

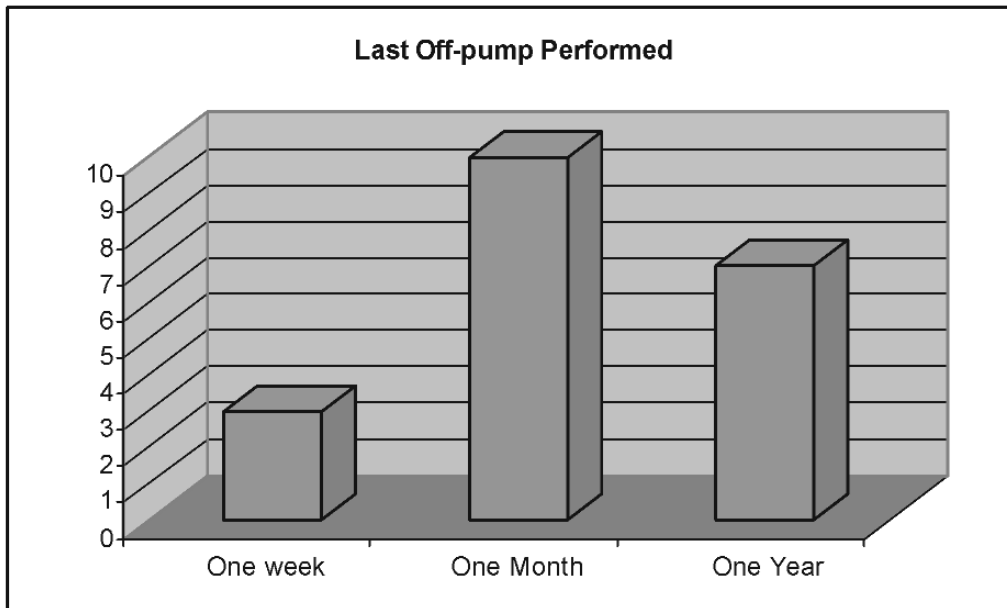
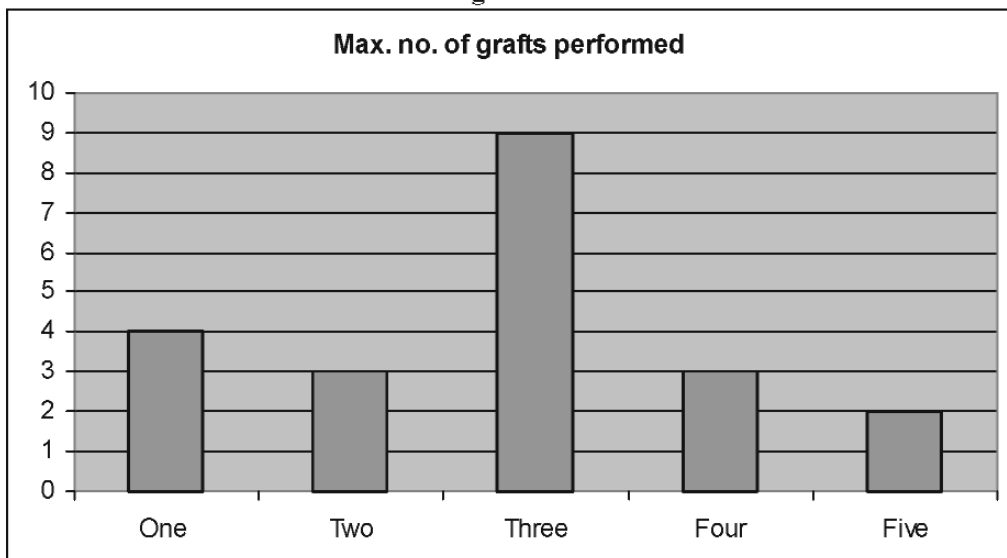


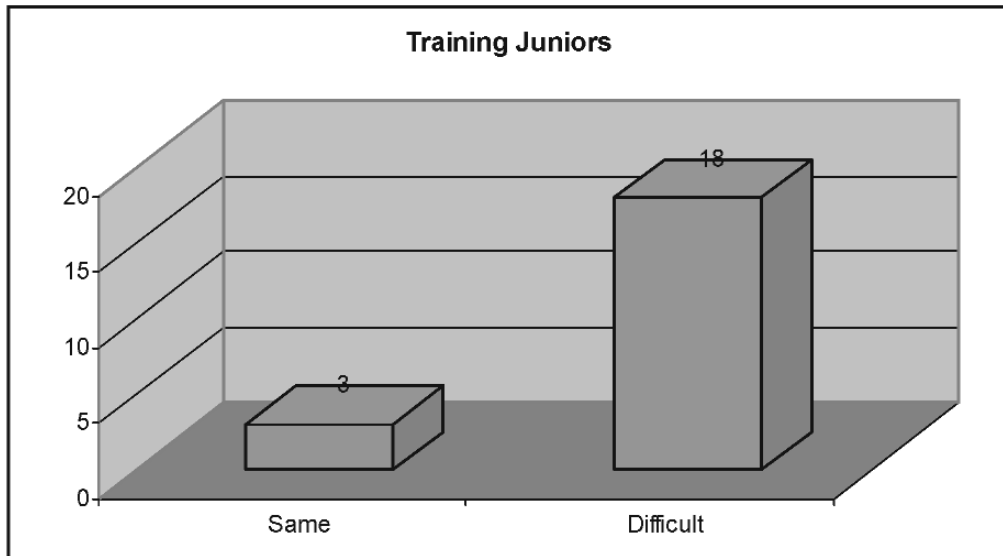
Figure VIII



disputed and is displayed here in Fig III. On enquiry to the origin of training, only four surgeons had some form of peer supervision in acquisition of this skill, rest of them either took on the task themselves or spent time in centers which practice off-pump CABG. Sixteen surgeons felt that on-pump CABG was preferable. Four of them had equal preference for both techniques, only one preferred to do his cases off-pump. Majority however feels that the procedure is beneficial for at least high risk patients (Fig IV). Table I lists the number of probable factors that could withdraw a surgeon in performing off-pump CABG. Majority of them feels that it is more difficult and not

as accurate. Twelve surgeons were keen to learn the technique if opportunity arose, while 7 did not feel the need to learn this new approach. Sixteen surgeons felt that off-pump CABG was more cost effective. Nineteen of them felt that conventional CABG is for staying and could not be replaced by off-pump CABG. It was almost unanimous opinion that post-operative recovery was quicker, and blood loss was less in off-pump CABG. There was also an agreement on the beneficial role of off-pump CABG in acute coronary syndrome, renal compromise, and obstructive airway disease (Fig V). But conventional CABG procedure should remain the main stay. Ten

Figure IX



surgeons had some exposure to OPCAB with peer assistance of varying degree (Fig VI). Only three surgeons were in active practice of this procedure during their training, while the rest were self trained. Four of them were more actively involved and had performed OPCAB at least in the last one week; 10 others would probably do off-pump sporadically. While 7 further, had not used this technique in last one year, at least (Fig VII). Majority of surgeons have performed between 1 and 3 grafts, mostly the surgeons were found comfortable with anterior vessels i.e. LAD, diagonal, and OM1. Only five surgeons ventures between 4-5 grafts per patient (Fig VIII). Lastly it was almost unanimous that OPCAB technique is difficult to pass on to the trainees (Fig IX).

DISCUSSION

Off pump coronary artery grafting has been established as a safe and effective procedure. It is demanding technically as the surgeon is faced with a beating heart and not a bloodless field, and involves a totally different mind-set for surgeons. In the hands of experienced and committed surgeons using appropriate patient selection, OPCAB surgery may result in improved outcomes. Beating heart coronary surgery is truly a team approach. Both the surgeon and the anesthesiologist must work in concert to attain a smooth, safe and efficient operation.

Indication for off pump coronary surgery depends on

the experience and comfort level of the surgeon. Its technical difficulty and unfamiliarity raises concern that adoption of OPCAB might be associated with poorer outcomes during each surgeon's 'learning curve'. Careful patient selection helps maintain acceptable outcomes during the 'learning curve'. Patients with depressed left ventricular ejection fraction, left main disease, and complex three vessel disease preferably should be excluded from OPCAB until significant experience is attained. The potential clinical advantages of off-pump coronary revascularisation have made this procedure an essential part of a cardiothoracic training program⁸. Consultants have a responsibility to learn new techniques themselves and to teach them to the trainees. The learning curve in off pump surgery must be followed due to the fact that beating heart coronary surgery is a completely different operation⁹.

Looking at the information made available by the local colleagues, it seems that there is still some reluctance in the adoption of OPCAB surgery. It is admirable however, to see that surgeons had no hesitation to accept that they were either not familiar or were not comfortable with off-pump CABG. This is the first time that a survey of local expertise was carried out to outline a trend in a particular procedure.

Our surgeons during their training were not exposed to OPCAB simply because it has come to fore only recently. And there are no avenues and opportunities locally for learning OPCAB. As for any new

procedure there is an expected learning curve. Are we prepared to accept it? In our institution Off-pump CABG was started by the author, only after assisting and observing an expert on few occasions. Challenges of learning curve were accepted, and experience was gathered as the number of cases increased. Operating time was initially longer as expected. But when expertise grew, it all became very simple. This is the time that a lot of patients who were high risk were really benefited. One inhibition to learning and practicing this technique here, is that there are only two public sector hospitals offering cardiac surgery, that can possibly promote OPCAB. It is understandable to have reservations and reluctance in accepting the learning curve by surgeons working in private institutions. This would highlight that as part of CME perhaps local chapter should arrange opportunities by inviting experienced faculty to impart their skill on seniors and juniors alike. It was encouraging to note however, that the local surgical fraternity was aware of the benefits Off-pump CABG.

Consultants have the responsibility to learn new techniques themselves and to teach them to the trainees. The more experience the trainees can gain while under the supervision of a consultant, the less they will need to improve as consultant surgeons and the less impact this will have on patient outcomes. A recent survey from cardiothoracic training centres in the United States showed that only a very small number of residents achieved competent levels in performing OPCAB surgery¹⁰.

CONCLUSION

In conclusion, OPCAB technique is under utilized in this city. Surgeons are keen to take it up. But there is reluctance to under go natural learning curve. There do not exist any avenues where hands on work shop could be conducted. However there is a consensus to the benefits of this approach to the high risk patients.

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