

Perspective Study of Surgical Myocardial Revascularisation in Rural Maharashtra Population

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Abstract

Background: Atherosclerotic coronary artery disease causes more morbidity, mortality and loss of economic capacity than any other group of disease. The modalities of revascularisation myocardium have undergone rapid advances in latest and alternate surgical techniques.

Method: Out of 430 patients 390 (90%) treated with CPB and 40 (9.13%) with OPCAB which includes 15 (3.48%) single vessels disease, 25 (5.8%) double vessel diseases. These are treated by grafting, conduits and IABP methods.

Results: We had successful surgical myocardial revascularisation with only 4% mortality.

Conclusion: CABG is the treatment of choice for multi-vessel coronary artery disease for myocardial revascularisation at different age groups.

Keywords: Myocardial, Revascularisation, CABG, IABP, Maharashtra

Introduction

Re-vascularising the myocardium jeopardised by atherosclerotic coronary artery disease (CAD) ⁽¹⁾. It is an area where cardiac medicine and surgeries are making fascinating advances every year. The scene is changing so rapidly that every time the subject is reviewed because in the text books, It was said that, man is as old as his arteries ⁽²⁾.

There are two main approaches to myocardial revascularisation, coronary artery bypass graft (CABG) and per coetaneous coronary intervention

(PCI) ⁽³⁾. In patients with advanced coronary arteries disease CAD, CABG is associated with improved long term out comes while PCI is associated with lower periprocedural complications ⁽⁴⁾. Minimally invasive techniques for bypass surgery have played a significant part in bringing CABG heart beat, and HMR (hybrid myocardial revascularisation) approaches in contemporary practice ⁽⁵⁾. Hence attempt was made to evaluate the surgical myocardial revascularisation with latest methods for early heal and short hospital stay of the MI patients.

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Material and Methods

430 adult patients admitted at ICU ward of MGM Medical College hospital Aurangabad-431005 Maharashtra were studied.

Inclusive Criteria: Patients more than 20 years having diagnosed MI, and fit for anaesthesia were selected for study.

Exclusion Criteria: Patients with Ischemic cardiomyopathy with congestive cardiac failure and portal Hypertension. Unfit for anaesthesia were excluded from study.

Methods

Patients were administered with general anaesthesia, surgical techniques include CABG. It has two types (a) Arterial conduits internal thoracic artery, Radial artery, Gastro-epiploic artery. (b) Venous conduits - Great or long saphenous vein. Technical considerations of grafting in CABG had on-pump CABG, OPCAB minimally invasive direct coronary artery bypass surgery (MI DCAB) and Hybrid revascularisation as per the need for vascularisation of MI was performed.

Duration of surgery was March 2012 to March 2015

Statistical analysis: Different age groups patients were classified with percentage. Various techniques and number patients, mortalities were also classified

Table 1: Distribution of age groups in MI patients

(No of patients: 430)

Age (Years)	Number of patients (430)	Percentage (%)
45-50	19	4.41
51-59	111	25.8
60-69	235	12.7
70-79	55	12.7
>80	10	2.32

with percentage. The statistical analysis was carried out in SPSS software. The ratio of male and female was 2:1.

Observations and Results

Table-1: Distribution of age groups in MI patients - 19 (4.4%) were aged between 45-50 , 111 (25.8%) between 51-59 years of age, 235 (54.9%) were between 60-69 of age, 55 (12.7%) were between 70-79 of age, 10 (2.32%) were more than 80 years of age.

Table-2: Study of surgical techniques in MI patients 390 (90%) were treated with cardio-pulmonary bypass (CBP) and 40 (9.13%) were treated with OPCAB (heart beat) among them 15 (3.48%) had single vessel disease, 25 (5.8%) had double vessel disease.

Grafts - 28 (6.5%) patients received more than 3 graft (up to 5 grafts), 119 (27.6%) received 2 graft, 41 (9.5%) received only one graft

Conduits - 358 (83.2%) received LIMA to LAD, 18 (4%) received addition Radial artery (RA)

Balloon Pumping support - 35 (8.1%) received IABP in post-operative period for cardiac output (Mean hours of support was 52 hours)

Mortality - Total 16 (4.6%), 8 (1.8%) due to refractory low cardiac output, 4 (0.93%) due to Acute Renal failure and 2 (0.93%) due to DIC.

Table 2: Study of different techniques

(No of patients: 430)

Technique	Number of patients (430)	Percentage (%)
CPB	390	90%
Beat heart (OPCAB)		
Single vessel disease	40	9.13
Double vessel disease	15	3.48
More than one 3 grafts (up to 5 grafts)	28	6.5
Received 3 graft	119	27.6
Received 2 graft	242	56.2
Received one graft	358	83.2
Conduits		
Received LIMA to LAD	358	83.2
Received additional RA	18	4
Intra-aortic Balloon pumping (IABP) support in immediate post-operative period for low cardiac output maximum period of IABP support (Mean 52 hrs) (28 hours to 98 hours)	35	8.13
Mortality	16	4.6
Cause of death was refractory low cardiac out put	8	1.86
Acute renal failure	4	0.92
DIC	2	0.46
Mediastinitis	2	0.46

DIC = Disseminated intravascular coagulation

IABP = Intra-aortic Balloon Pumping

Discussion

Present perspective study of surgical myocardial revascularisation in Maharashtra population. The age group of patients was 19 (4.4%) were 45-50, 111 (25.8%) were 51-59 of age, 235 (54.6%) were 60-69 of age, 55 (12.7%) were 70-79 of age, 10 (2.32%) were above >80 years (Table-1). 390 (90%) patients undergone CPB, 40 (9.1%) Beat heart (OPCAB) among them 15 (3.48%) had single vessel disease, 25 (5.8%) had double vessel disease, 28 (6.5%) had more than 3 grafts (up to 5 grafts), 119 (27.6%) treated with 3 grafts, 242 (56.2%) treated with 2 grafts, 41 (9.5%) treated with one graft, 358 conduits were received IMA to LAD, 18 (4%) received additional RA, 35 (8.13%) IABP support was given post-operatively, 16 (4.6%) mortality (Table-2). These findings were more or less in agreement with previous studies ⁽⁶⁾⁽⁷⁾⁽⁸⁾.

The issue of stent Vs CABG is beyond the scope of this article patients prefer CABG for LMCA (Left main coronary artery disease), TVD or diffused triple vascular disease especially in Diabetic patients where incidence of stents blocked is very high. Single or double vessels or multiple blocks, calcified coronaries, the introduction of stents is of no use. In LAD ostial stenosis stenting may jeopardise a normally flowing circumflex artery. In complications of acute MI such as acute ischemic mitral regurgitation due to papillary muscle rupture post MI ventricular septal defect and left ventricular Aneurysm the CABG is of great value. In acute complications of stenting dissection, thrombus formation and coronary perforation patients require valve replacement. It is reported that approximately 80,000 patients undergo CABG in India every year ⁽⁹⁾. Incidences of CAD in Diabetic patients because vessels frequently require

endarterectomy i.e. removal of atheromatous plaque from lumen. The requirements of endarterectomy patients with diffuse disease undergo CABG ⁽¹⁰⁾.

Conduits for CABG for IMA/ITA – left internal mammary artery (LIMA) have been described as god gifts to mankind for revascularisation. Patients will be free from atherosclerosis, as it runs just above the heart in the chest wall and has an ideal lumen match with native coronary arteries ⁽¹¹⁾. The free conduct i.e., proximal and attached to Aorta the patency with LIMA to LAD is almost as high as with prescribed graft. The pedicled LIMA has been likened to a “drug eluting live graft” as its endothelium continues to secrete endothelium derived relaxing factor and prostacyclin which are important contributing factors for its high patency ⁽¹²⁾.

In OPCAB the cardiopulmonary bypass is avoided and the heart is allowed to beat, hence the name is beating heart surgery. The first anatomises done is LIMA to LAD on the anterior surface after stabilizing the heart with the help of positioning systems (octopus). Apart from this Robotic CABG Hybrid Revascularisation, anatomising devices are also used as per the status of cardiac diseases.

Summary and Conclusion

The present study of surgical myocardial revascularisation CABG is the treatment of choice for multi vessel coronary artery disease and left main coronary artery disease especially in type-II DM patients.

Conventional on pump CABG is a time tested safe modality for multi vessel grafting off pump/ beating heart surgery has been largely abandoned due to concerns of under grafting and diminished long term graft patency. OPCAB practice in India is largely confined to private hospitals due to cost-effectiveness. Left internal mammary artery (LIMA) is best drug eluting “graft with 90% patency”.

Latest technique to access for myocardial vascularisation facilities must be available in every government hospitals so that patients with low economic status can avail these facilities.

Limitation of Study – Owing to tertiary location research centre, small number of patients and lack of latest techniques we have limited findings and results.

- **This research paper was approved by Ethical committee of MGM Medical college and hospital Aurangabad-431005, Maharashtra**
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