



**COMPARATIVE STUDY OF SKELETONIZED AND PEDICLED LEFT INTERNAL MAMMARY ARTERY GRAFTS IN CORONARY ARTERY BYPASS SURGERY WITH RESPECT TO CLINICAL OUTCOMES**

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**ABSTRACT**

**INTRODUCTION:** Coronary artery bypass grafting is the most commonly performed cardiac surgical procedure worldwide. There had been various prospective and retrospective studies comparing the long term patency of grafting following CABG with skeletonized and pedicled LIMA.

**AIM:** COMPARATIVE STUDY OF SKELETONIZED AND PEDICLED LEFT INTERNAL MAMMARY ARTERY GRAFTS IN CORONARY ARTERY BYPASS SURGERY WITH RESPECT TO CLINICAL OUTCOMES

**MATERIALS AND METHODS:** Study area, Coimbatore medical college government hospital, Tamil Nadu, India. A total of 100 patients undergoing elective isolated coronary artery bypass grafting between AUGUST 2017 to JULY 2019 were enrolled in this study.

**RESULTS AND CONCLUSION:** Pedicled LIMA group had slightly lower incidence of angina and less operating time, Sternal wound healing is better in skeletonized LIMA group.

**KEYWORDS :** Coronary artery bypass graft surgery (CABG), Coronary artery disease(CAD), Left internal mammary artery (LIMA).

**INTRODUCTION:** Coronary artery bypass grafting is the most commonly performed cardiac surgical procedure worldwide. The concept of Internal mammary artery to coronary artery anastomosis was introduced in the early 1940s by Vineberg. It was after the extensive works of Dudley Johnson, Charles Bailey and colleagues that Internal mammary artery started gaining its importance in cardiac surgical practice as a conduit for coronary artery bypass grafting<sup>1</sup>. Rene Favalaro performed the first physiological connection of a conduit from the aorta to the coronary artery in 1967<sup>2</sup>. As we discuss below the unique histology and favourable anatomy of the LIMA with its close proximity to the left heart especially the Left coronary artery and its proven long time patency makes it the ideal conduit for coronary artery anastomosis.

There had been various prospective and retrospective studies comparing the long term patency of grafting following a CABG with skeletonized and nonskeletonized (pedicled) LIMAs.

As per the literature evidence there are advantages and disadvantages in each type of harvesting patterns. Some of the advantages of nonskeletonized grafting include ease of handling, decreased harvesting time, and a lower tendency for graft dissection. In the case of skeletonized grafts the advantages are the additional length of the conduit, less wound infection and less postoperative blood usage but a higher tendency for injury and dissection during harvest.

**AIM:** COMPARATIVE STUDY OF SKELETONIZED AND PEDICLED LEFT INTERNAL MAMMARY ARTERY GRAFTS IN CORONARY ARTERY BYPASS SURGERY WITH RESPECT TO CLINICAL OUTCOMES

**MATERIALS AND METHODS:** 9.1 Study area, Coimbatore medical college government hospital Coimbatore, Tamil Nadu, india.

9.2 Study population: All elective coronary artery bypass grafting including males and females from the year 2017 to 2019 were enrolled in this study. Majority of the patients hailed from towns and villages near coimbatore 9.3 Sample size & Sample technique: A total of 100 patients undergoing elective isolated coronary artery bypass

grafting between August 2017 to july 2019 were enrolled in this study. They were randomly assigned into one of the groups (Group A- Skeletonized and Group B- Non skeletonized or pedicled).

All patients undergoing elective coronary artery bypass grafting under midline sternotomy. **INCLUSION CRITERIA:** Controlled Diabetes Mellitus (Glycated hemoglobin (HbA1C) <8), All elective clean coronary artery bypass grafting surgeries. **EXCLUSION CRITERIA:** Redo CABG, Combined procedures with CABG, Bilateral IMA grafting, Total arterial revascularization, Emergency CABG, Chronic Obstructive Pulmonary Disease (COPD).

**Harvesting technique**

A Monopolar cautery –with fulgurate mode, power energy of 20 W is to be used for harvesting the IMA. In the nonskeletonized group, the dissection is done about 5 mm away from the mammary artery and the vein is taken along with the artery. In the skeletonized group, the dissection is close to the artery and the accompanying vein is left on the chest wall. The end close to the chest wall is either cauterized or clipped according to the size of the branch. Distal end of the LIMA is divided 5-6 mm proximal to the bifurcation.

**RESULTS:**

Out of 100 cases Pedicled LIMA harvested in 50 patients. and skeletonized LIMA in 50 patients and followed up.

**Table 1. AGE WISE DISTRIBUTION OF CASES**

AGE GROUP	SKELETONIZED	PEDICLED
36 - 45 YRS	3	2
46-55YRS	11	13
56-65YRS	26	25
66-75YRS	10	10
TOTAL	50	50

Majority of patients in our study belongs to age group 56 to 65 years in both skeletonised and pedicled groups

**Table 2:SEX WISE DISTRIBUTION OF CASES**

SEX	SKELETONIZED	PEDICLED
MALE {82%}	42	40

FEMALE{18%}	8	10
TOTAL	50	50

Male patients contribute majority of cases around 82%.skeletonised LIMA harvested in 42 male and 8 female patients.pedicled LIMA harvested in 40 male and 10 female patients.

**Table 3:DIABETES MELLITUS WISE DISTRIBUTION OF CASES.**

DM	SKELETONIZED	PEDICLED	TOTAL
YES	30	25	55
NO	20	25	45

As shown 55 % of patients are diabetics..out of 55 cases 30 cases in skeletonised group 25 patients in pedicled group.

**Table 4:SMOKING WISE DISTRIBUTION OF CASES:**

SMOKING	SKELETONIZED	PEDICLED	TOTAL
YES	40	32	72
NO	15	13	28

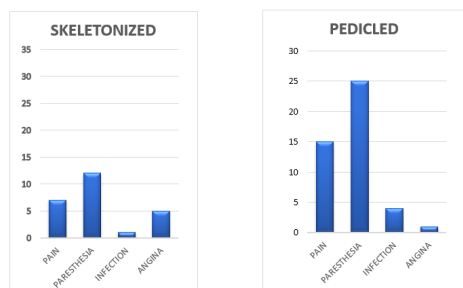
Majority of operated patients 72% are smokers.28% non smokers.skeletonised group 40 patients are smokers.pedicled group 32 patients are smokers.

**Table 5:HARVEST TIME**

HARVEST TIME	AVERAGE
SKELETONIZED	30 MINUTES
PEDICLED	20 MINUTES

Average harvest time 30 minutes in skeletonised patients.20 minutes in pedicled patients.

**Figure 1:POST OPERATIVE COMPLICATIONS :**



In the skeletonised group 7 patients over surgical site.12 patients had paresthesia.1 patients had infection.5 patient had angina.

In the pedicled LIMA group 15 patients over surgical site.25 patients had paresthesia.4 patients had infection.1 patient had angina.

**DISCUSSION**

CABG had become the most common surgery done in cardiothoracic departments all over the country.<sup>3</sup>

The Internal mammary artery is the gold-standard conduit for coronary artery bypass surgery<sup>3,4</sup>. Pedicled LIMA harvested in 50 cases and skeletonized LIMA harvested in 50cases and divided into 2 groups and followed up.

Male patients contribute majority of cases around 82% in our demographic population with female patients 18% in our study group.6 Skeletonised LIMA harvested in 42 male and 8 female patients.pedicled LIMA harvested in 40 male and 10 female patients.

Majority of patients in our study belongs to age group 56 to 65 years in both skeletonised and pedicled groups are 26 and 25

respectively,

Out of 100 cases 72 % are smokers and 55% are diabetics.there is no major difference in skeltonised and pedicled groups with respect to clinical outcomes in diabetics and smoking patients.

Average time for harvesting pedicled LIMA is 20 minutes and skeletonized LIMA is 30 minutes.7 pedicled LIMA can be harvested faster compared to skeletonized LIMA grafts.

In the skeletonised group 7 patients over surgical site.12 patients had paresthesia, 1 patient had infection,5 patient had angina.

In the pedicled LIMA group 15 patients over surgical site.25 patients had paraesthesia, 4 patients had infection.1 patient had angina.

Out of 100 patients, 5 had sternal wound infection (4 in the pedicled group and one in the skeletonized group), which were managed conservatively after pus culture and sensitivity and daily dressing and appropriate antibiotics given8-10. This shows there is slightly lower incidence of wound infection in skeltonised group.

Pedicled LIMA groups had slightly lower incidence of angina and dyspnea postoperatively compared to skeletonized groups.

Although there were no angiographic studies of LIMA grafts the patient,s general condition and all patients were subjected to echo evaluation periodically in the post-operative period for ejection fraction and motion wall abnormality of the left ventricle. Further follow-up echo done 3 months after discharge.

**CONCLUSION:**

Skeletonized IMA is advantageous interms of length,patency and less damage to collateral blood supply,slightly lower incidence of superficial infections.

Skeletonized IMA can be considered in patients with uncontrolled diabetes high BMI with tight lesion in LAD with good distal run off who need an arterial graft for revascularization.

Careful dissection and clipping of branches should be followed during an IMA harvest.

Low diathermy use and avoid excess heat to prevent dissection.

Pedicled LIMA groups had slightly lower incidence of angina and dyspnea postoperatively compared to skeletonized groups.

pedicled LIMA can be harvested faster and can be used in emergency situations when there is desperate need of arterial conduit.

In Diabetic patients it should be used cautiously as the blood supply and micro collaterals are also affected by the atherosclerotic process.

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