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The impact of total arterial revascularization off pump coronary bypass grafting in impaired left ventricular function

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ABSTRACT

Background: The Arterial grafts have the advantage of durability and may have a protective effect by reducing the progression of native coronary artery disease (CAD) in grafted vessels. This study aimed to evaluate the impact of total arterial revascularization off pump coronary artery bypass grafting (CABG) in impaired left ventricular (LV) function patients with Ejection Fraction (EF) ≤ 35% concerning the short-term results.

Methods: From August 2006 to August 2015, 287 patients with EF ≤ 35% out of 1950 patients underwent CABG in our Department of Cardiac-Thoracic Surgery, Zagazig University hospital, Egypt, for myocardial revascularization procedures were studied with a prospective registry of their data. Group 1 included 137 patients subjected to total arterial revascularization off Pump (TAROP) and Group 2 included 150 patients subjected to conventional technique (C-CABG).

Results: Hospital mortality was less in group 1 (4.37% versus 4.66%). The duration of intensive care unit stay and the hospital stay were shorter in the group 1, with statistical significance. The mean graft patency rate for 113 (82.5%) patients of group 1 (TAROP) and 113 (75.3%) group 2 (C-CABG, utilizing internal mammary and venous grafts) at one month were 98.2% and 80.5% respectively. The short-term outcome revealed that the mean postoperative LVEF improved significantly, from 29% ± 1.7% to 41.0% ± 2.0% ($p < 0.05$) for group 1 with an improvement of the NYHA classification of the patients in both groups.

Conclusions: Total arterial revascularization off-pump CABG in impaired left ventricular function can be achieved in most cases with low complication and mortality rates and accepted results.

1. Introduction

Coronary artery bypass grafting (CABG) in patients with reduced left ventricular (LV) function remains a surgical challenge. Hospital mortality associated with LV dysfunction patients is still higher than that for normal LV function patients [1–3]. The method of complete revascularization for poor LV function will activate the hibernating myocardium [4]. It is considered that CABG is an effective option for patients with severe LV dysfunction [5,6] because the results of medical therapy are often

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unsatisfactory [7]. The Arterial grafts have the advantage of durability and may have a protective effect by decreasing the progression of native coronary artery disease (CAD) in grafted vessels [8]. Multiple arterial grafting may improve survival in patients who will be subjected to total arterial revascularization [8].

2. Patients and methods

From August 2007 to August 2015, 287 patients with Ejection Fraction (EF) ≤ 35% out of 1950 patients underwent CABG at our Department of Cardiothoracic Surgery, ZAGAZIG University, Egypt for myocardial revascularization procedures were studied with a prospective registry of their data.

137 patients in group 1 were subjected to Total Arterial Revascularization off Pump (TAROP) technique and 150 patients in group 2 were subjected to conventional CABG (C-CABG) technique.

2.1. Preoperative data

All data, according to the legal Customs and traditions of Egypt with granted informed consent specific to the type of surgery, were registered and collected, including patient's demographic data, risk factors, operative information and post-operative outcome data, from our database system. All data were collected at the time of operation. The protocol of the study was approved by our Department Review Board.

We excluded from this study, patients with LVEF <25%, single vessels disease, emergency operations, high-risk patients with Euro score >10 and patients with grade III Mitral Regurgitation (MR) with structural organic damages of the valve apparatus. Identification of impaired LV function was based on either the preoperative echocardiography and/or thallium-201 myocardial scintigraphy which were performed to measure the LV function and to assess myocardial viability. This viability study could be done in some patients according to their clinical, echocardiography and coronary LV angiography data. Euro SCORE was comparable in terms of surgical risk stratification. Outcome measures for this study included ICU and hospital stay, postoperative complications including bleeding, arrhythmias, and renal complications. Duration of inotropic support, the length of mechanical ventilation, hospital mortality and length of ICU and hospital stay were recorded. During the follow up visit, postoperative graft patency control at one month by coronary CT angiography for patients who present and accept the test.

Hospital mortality was defined as death after the procedure before patient's discharge regardless of the duration of hospitalization and also who died within 30 days after discharge from the hospital. Postoperative blood loss was defined as total chest tube drainage. Respiratory failure was defined as prolonged ventilator therapy (>72 h) or need for re-intubation or tracheostomy. Renal complications included acute renal failure with creatinine >200 mmol/L (see Figs. 1–3).

2.2. Indication of surgery

The indication for surgery was congestive heart failure with reversible ischemia or unstable or post infarction angina. Patients with isolated left main LM disease >50% or two- or three-vessel disease (>70% stenosis) referred for elective or urgent CABG (more than one graft planned) were eligible provided that the ventricular EF ≤ 35%. Allen's test on one of the

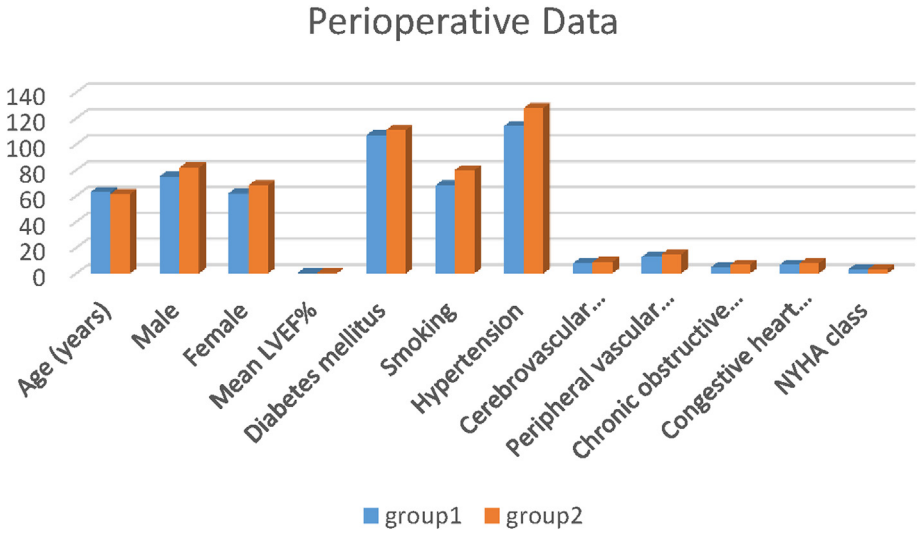

Fig. 1. Preoperative data.

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