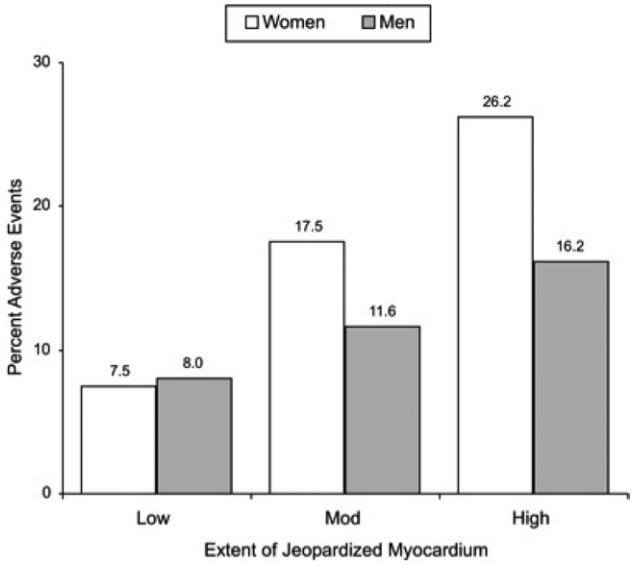
low cardiac output syndrome, stroke, sepsis, deep sternal wound infection, myocardial infarction, prolonged ventilation, or return to the intensive care unit). Multivariable logistic regression was used to compare the risk-adjusted impact of jeopardized myocardium on adverse events between women and in men.

RESULTS: A total of 3741 patients underwent first time, isolated CABG during the study period, of whom 3325 (89%) had complete angiographic data and formed the final study population. Women (n=755) were older (p=0.0001) and presented more often with hypertension (p=0.0001), diabetes (p=0.0001), heart failure (p=0.0001), and an urgent/emergent presentation (p=0.002). Despite having similar severity of Duke Index scores (p=0.08), women received fewer distal anastomoses (p=0.0001) and left internal mammary artery (LIMA) grafts (p=0.0003). Following surgery, women experienced greater in-hospital mortality (5.4% vs. 2.5%, p=0.0001) and adverse events (20.7% vs. 13.7%, p=0.0001). Increasing jeopardized myocardium was associated univariately with a greater increase in adverse events in women than in men (Figure 1). In separate logistic regression models for each sex, increasing extent of jeopardized myocardium was an independent predictor of in-hospital adverse events among women (High: OR 3.8, 95% CI 1.6-9.1; Moderate: OR 3.0, 95% CI 1.2-7.4; Low: OR 1.0), but not among men (High: OR 1.2, 95% CI 0.7-1.9; Moderate: OR 1.1, 95% CI 0.7-1.9; Low: OR 1.0). Incomplete revascularization and LIMA grafting were not associated with in-hospital adverse events.

CONCLUSION: The extent of jeopardized myocardium was independently associated with increased likelihood of in-hospital adverse events among women, but not men, following CABG. This novel finding may help to explain the observed sex differences in outcome following revascularization.



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LEFT VENTRICULAR END-DIASTOLIC PRESSURE VERSUS LEFT VENTRICULAR EJECTION FRACTION AS A PREDICTOR OF SURVIVAL FOR PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFT SURGERY

J Nagendran, CM Norris, J Appoo, DB Ross, J Nagendran

Edmonton, Alberta

BACKGROUND: The association between depressed left ventricular ejection fraction (ejection fraction < 35%; LVEF) and increased mortality in patients undergoing coronary artery bypass graft (CABG) surgery has been well defined. There are now studies revealing that elevated pre-operative left ventricular end-diastolic pressure (LVEDP) is an independent predictor of operative mortality for patients undergoing CABG, and could be a greater risk than LVEF < 35%. Thus, whether LVEDP is a better predictor of long-term survival than LVEF in patients undergoing CABG surgery remains unclear.

METHODS: APPROACH, a clinical data collection and outcome initiative capturing all patients undergoing isolated CABG in Alberta, Canada, was used to identify 6790 patients between 1996 and 2011. Patients were divided into four groups based on LVEF and LVEDP:
Group 1 (LVEF≥35%, LVEDP<18mmHg),
Group 2 (LVEF<35%, LVEDP<18mmHg),
Group 3 (LVEF≥35%, LVEDP≥18mmHg),
Group 4 (LVEF<35%, LVEDP≥18mmHg).
The Kaplan- Meier method was used to estimate long-term survival after revascularization and multivariate Cox proportional hazards modeling was used to determine independent risk factors of mortality.

RESULTS: There were a total of 6790 (18.2% female) patients undergoing isolated CABG, the mean age was 66± 11 years. The 4 groups had similar pre-operative characteristics of age, history of cerebrovascular disease, renal failure, peripheral vascular disease, hypertension, and hyperlipidemia. Patients with a low LVEF (Groups 2 and 4) had a higher incidence of chronic obstructive pulmonary disease, congestive heart failure (CHF), history of smoking and history of myocardial infarction (p<0.01). The Kaplan- Meier method identified that the groups with preserved LVEF (Groups 1 and 3) had improved long-term survival compared to groups with depressed LVEF (Groups 2 and 4, p<0.001, Figure 1). As well, there was no significant correlation between elevated LVEDP and decreased survival in patients with a preserved LVEF. However, an LVEDP < 18 mmHg was associated with improved long-term survival when compared to patients with an elevated LVEDP in patients with depressed LVEF (Group 2 vs. Group 4, p<0.001). Other significant independent predictors for death were: LVEF<35%, age, COPD, peripheral vascular disease, dialysis dependence and CHF (p<0.001). Elevated LVEDP≥18mmHg was not an independent risk factor for mortality.

CONCLUSION: Elevated LVEDP≥18mmHg is not an indepen-

dent risk factor for mortality in patients undergoing isolated CABG. However, in patients with a depressed LVEF, an elevated LVEDP is associated with poor long-term survival when compared to patients with an LVEDP < 18 mmHg. Overall, decreased long-term survival is best correlated with low LVEF<35%.

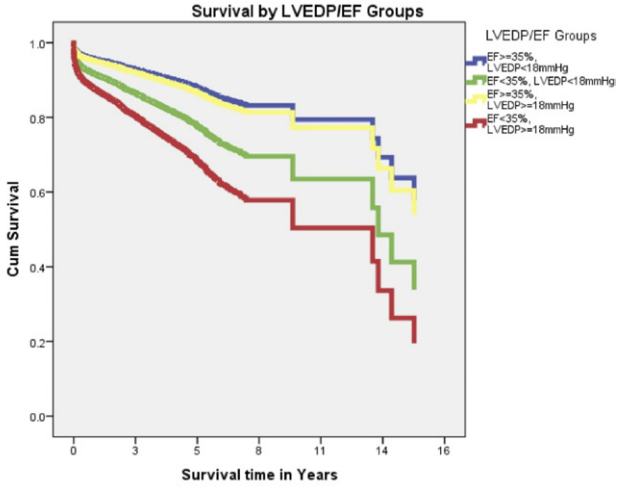

Figure 1. Kaplan-Meier plots of survival

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Featured Research

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MID-TERM RESULTS OF 800 MINIMALLY INVASIVE CORONARY BYPASS OPERATIONS

M Ruel, M Shariff, H Lapierre, B Sohmer, JT McGinn

Ottawa, Ontario

BACKGROUND: To evaluate the mid-term outcomes of the minimally invasive CABG (MICS CABG) operation.

METHODS We prospectively followed 800 consecutive patients who underwent MICS CABG, performed through a 4-6 cm thoracotomy in the left 5th intercostal space. During MICS CABG, the left internal thoracic artery is harvested under direct vision using long instruments, proximal anastomoses are handsewn onto the ascending aorta after mobilizing it in a stepwise fashion, and all myocardial territories can be accessed for distal anastomosis by use of an apical positioner and/or epicardial stabilizer. Mean follow-up was 2.2 years (maximum 6.4 years).

RESULTS: Mean patient age was 63.5 ± 10.8 years and 197 patients were female (24.6%). A mean of 2.2 ± 0.8 grafts were performed. Peripheral cardiopulmonary bypass assistance was used in 77 patients (9.6%). There were 25 (3.1%) conversions to sternotomy, and 26 (2.7%) reoperations for bleeding. New onset atrial fibrillation occurred in 187 (23.4%). Overall, the median hospital length of stay was 4 days, and perioperative mortality was 1.0% (8/800). At follow-up, no deep wound infection occurred. At 2 years postoperatively, mid-term survival after MICS CABG was 98.0 ± 0.7%, and 22 patients (2.8%) had undergone percutaneous coronary reintervention.

CONCLUSION: These results indicate that MICS CABG constitutes a feasible and increasingly established minimally invasive alternative for patients in need of multivessel CABG. It is associated with a short hospital length of stay, with no deep wound infections, and it is a safe, reproducible operation that yields survival and durability results in par with those of conventional CABG.

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OUTCOMES OF ISOLATED REOPERATIVE CABG IN PATIENTS AGED 75 YEARS AND OLDER

M Al Jughiman, K Algarni, T Yau

Toronto, Ontario

BACKGROUND: Reoperative coronary artery bypass graft CABG is known to confer additional risks. However, the risk profile and outcomes of reoperative CABG in elderly patients are not as well defined.

OBJECTIVE: The purpose of this study was to examine trends in the risk profile and short-term outcomes of isolated reoperative CABG in patients aged 75 years and older, compared to isolated primary CABG in the same age group, over a 20-year period.

METHODS: Between 1990 and 2010, 3483 elderly patients (75 years and older) underwent isolated CABG at our institution. Of these, 129 (3.7%) underwent reoperative CABG. Data was prospectively collected in a computerized database. Patients' demographics, intraoperative, and postoperative details were analyzed. Independent predictors of operative mortality were determined by multivariable logistic regression. To evaluate the effect of time on postoperative outcomes, we divided the 129 elderly patients undergoing reoperation into two chronologic groups according to the year of operation(1990 - 1999, n = 82, vs. 2000 - 2010, n = 47).

RESULTS: The mean age was 78.2+/−3.0 years in the primary group and 77.1+/−2.0 years in the reoperative group ($p < 0.001$). Hospital mortality was 3.2% and 8.5% ($p < 0.001$) in the primary group and reoperative group respectively. Perioperative myocardial infarction occurred in 2.9% and 8.5% ($p < 0.001$), and low output syndrome (LOS) occurred in 6.2% and 20.9% ($p < 0.001$), of patients in the primary group and reoperative group respectively. Perioperative strokes occurred in 2% of the primary group and 3.9% of the reoperative group ($p = 0.13$). Mean ICU stay was 2.7+/−4.3 days in the primary group and 3.7+/−6.2 days in the reoperative group ($p = 0.01$). The independent predictors of mortality were urgent timing (OR 7.9; CI 3.5-17.8), LVEF 20-39% (OR 4.5; CI