

Moderated Poster Sessions

Sunday, June 23, 2002, 8:00 a.m. – 9:00 a.m.

MP1 PRIMARY STENTING OR E-ACAB? COMPARISON OF THE TWO METHODS OF REVASCULARIZATION IN SINGLE LAD STENOSIS, ONE YEAR FOLLOW-UP

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OBJECTIVE: Percutaneous revascularisation is well-accepted method of treatment in single left anterior descending (LAD) stenosis. It has become the treatment of choice in LAD lesion with the introduction of primary stenting. For the last few years, however, the implementation of minimally invasive cardiac surgery methods, video-assisted left internal thoracic artery (LITA) harvesting, robotic surgery etc, has risen the question, whether mini invasive surgical revascularisation could be competitive to percutaneous coronary interventions (PCI) in a single vessel stenosis.

METHODS: 100 patients, with CCS class II or more, and angiographically confirmed, single critical A or B stenosis of LAD, were randomized to direct, primary stenting (DS)-group I (50 pts), or to video-endoscopic atraumatic coronary artery bypass grafting (E - ACAB) - group II (50 pts).

RESULTS: In all the patients in group I we reached a very good angiographic and clinical effect, without acute complications during hospitalization in 1-month follow-up period. In 1-year follow – up, 6 patients (16.6%) developed restenosis of the LAD. In these cases successful re-PCI of target vessel lesion were performed. In group II, a very good result of cardiac surgery was observed, and there were no major in-hospital and 1-month follow-up complications. In 1-year follow up, non symptomatic critical stenosis of anastomosis of the LITA-LAD was observed angiographically in 1 case (2.5%). Patient was treated by use of balloon angioplasty with good result.

CONCLUSIONS: Our observations showed an evident prevalence of cardiac surgery (E-ACAB) above direct, primary stenting in LAD revascularisation, with only slightly higher costs of surgical procedure.

MP2 OPCAB WITH HOLMIUM: YAG TMR OFFERS COMPLETE REVASCULARIZATION WITH EXCELLENT OPERATIVE RESULTS AND SUSTAINED ANGINA RELIEF

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OBJECTIVE: Off pump CABG (OPCAB) continues to appear to offer enhanced patient outcomes in comparison to standard on pump CABG. However, increased use of aggressive catheter based coronary intervention has led to patients presenting for surgical revascularization with more advanced coronary disease. It therefore has become increasingly difficult to obtain complete surgical revascularization regardless of whether CABG is performed on or off pump. TMR combined with off pump CABG appears to be an attractive combination offering multiple benefits.

METHODS: At Deborah Heart and Lung Center, since 1998, forty-five patients who were felt not to be able to completely revascularized with CABG alone were consecutively referred for OPCAB + TMR (n = 45) utilizing HOLMIUM :YAG TMR(CardioGenesis)and suction stabilization-OCTOPUS (Medtronic)

RESULTS: Mean age was 64.9 years, with 75% males. Fourteen patients (31%) had undergone previous PTCA, CABG or both. Mean EF was 39.8%. Mean number of grafts per patient was 1.5 (Octopus, Medtronic). Mean number of lasered regions (1-4) per patient was 3 (Holmium :YAG, CardioGenesis). Mean number of laser channels per patient was 22. Mean number of “ revascularized” coronary territories (CABG or TMR) per patient was 4 - revascularization of the main coronary beds (anterior, lateral, posterior, inferior) was thus achieved in all patients. Mortality (2.2%, n = 1) and morbidity (28%) were low, with LOS of 8.5 days. 100% follow-up was obtained with mean 1.7 years (0.1 to 3.4 years range). Angina relief was profound and sustained with 95% angina free. 95% of patients were on no antianginal medications. Late cardiac mortality was low (2.2%, n = 1). Need for re-cath (n = 2, 4.4%), or re-intervention, PTCA or CABG (n = 0, 0%) were negligible. Qualitative improvement in lifestyle (questionnaire) revealed 93% patients in the top category (very good) with only 7% same or 0% worse than preoperatively. 94% of patient would recommend the procedure to other patients in similar circumstances.

CONCLUSIONS: We conclude that OPCAB + TMR is associated with low operative mortality and morbidity and low late mortality or major events. The adjunctive addition of TMR allows a more complete revascularization to be performed even in the presence of advanced coronary disease. At nearly 2 years follow-up angina relief remains profound and sustained.

MP3 ATRIAL PACING FOR STABLE HEMODYNAMICS DURING OFF-PUMP BYPASS SURGERY

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OBJECTIVE: Off-pump surgery becomes more popular, however, in most units it is still not a routine procedure because of instable hemodynamic situation while tilting the heart. We present a simple manoeuvre to maintain stable hemodynamics during off-pump surgery.

METHODS: Eleven consecutive patients (8 male, 3 female, age: 68.14±10.3 years, LVEF: 51.17±18.6 %) admitted for coronary artery bypass grafting, were equipped with a PICCO catheter for monitoring of cardiac output (CO), cardiac index (CI), stroke volume (SV), and peripheral vascular resistance (PVR). Apart from these parameters also heart rate (HR), systolic and mean arterial pressure (RRs, RRm), and left atrial pressure (LAP) were monitored. After opening of the pericardium temporary pacemaker wires were installed and hemodynamic monitoring was performed before and after atrial pacing. All procedures were performed in the same standardized OPCAB technique.

RESULTS: All patients survived the procedure without inotropic support. In all cases a branch of the circumflex artery was grafted. Grafts per patient was 2.7.

	Before atrial pacing	After atrial pacing	T-Test
HR /min	61.72 ± 8.6	93.27±4.5	p<0.001
RRs mm Hg	88.63±10.7	99.72±10.1	p<0.01
RRm mm Hg	64.09±7.9	73.81±5.5	p<0.005
CO l/min	4.02±1.3	5.11±0.7	p<0.005
CI l/min/m ₂	2.05±0.5	2.66 ±0.41	p<0.005
PVR dyn x sec /cm ₂	1210.91±406.6	1092.73±306.6	Not significant
LAP mm Hg	18.50±5.2	12.50±3.0	p<0.05
SV ml	60.8 ± 10.8	49 ± 11.4	p<0.005

CONCLUSIONS: Atrial pacing while off-pump surgery increases HR, RRs, RRm, CO, CI and decreases LAP and SV significantly, thus offering stable hemodynamics while off-pump surgery. In the last 210 consecutive OPCAB procedures there was only one conversion (0.4%) to cardiopulmonary bypass.

MP4 COMPARISON OF OFF-PUMP AND ON-PUMP CABG IN LATE GRAFT PATENCY AND CARDIAC EVENT FREE RATE

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OBJECTIVE: Recently off pump coronary artery bypass (OPCAB) has been popular for surgical treatment of coronary vessel disease. The initial advantages of OPCAB that reduces operation time, bleeding, hospitalization, and transfusion have been achieving consensus. Although early graft patency of OPCAB is comparable with conventional on-pump coronary artery bypass (CABG), the differences between OPCAB and conventional on-pump CABG in late graft patency and the cardiac event free rate are controversial. We examined midterm results of OPCAB and conventional on-pump CABG.

METHODS: From 1998 to 2001, 482 patients were retrospectively reviewed. 285 patients (59%) composed OPCAB group, and 197 (41%) composed on-pump CABG group. The use of aortic grafts was 91.6% in OPCAB group, and 58.3% in on-pump CABG group. Average of follow up time was 1.6_}4.4 years, and 435 patients (90%) underwent coronary and graft angiography. We examined late graft patency, and the cardiac event free rates in both groups.

RESULTS: The mean number of distal anastomoses was 3.0_}1.0 in OPCAB group, and 3.3_}1.1 in on-pump CABG group (p = 0.0005). Early graft patency was not different between two groups (95.7% in OPCAB group versus 93.4% in on-pump CABG group, p = 0.06). Late graft patency was 78.9% in OPCAB group, and 66.7% in on-pump CABG group (p<0.0001). The cardiac event free rate at 36 months was 86.1% in OPCAB group, and 81.8% in on-pump CABG group (p = 0.87). In OPCAB group the cardiac event free rate at 36 months was higher in patients performed total revascularization than in patients performed incomplete revascularization (95.9% versus 78.5%, p = 0.0019).

CONCLUSIONS: Midterm results for OPCAB is satisfactory. Total revascularization is important for better prognoses, though OPCAB is technically demanding.

MP7 COMPARISON OF TWO DIFFERENT STABILIZER CONCEPTS FOR OFF-PUMP CORONARY ARTERY BYPASS SURGERY

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MP5 A MINIMALLY INVASIVE TEST TO DETERMINE PATENCY POST-CORONARY ARTERY BYPASS GRAFT

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OBJECTIVE: Determining patency post coronary artery bypass graft requires cardiac catheterization which is costly and carries a potential procedure related risk. Electron Beam Coronary angiography is a minimally invasive procedure that appears suitable for determining patency and deterioration of bypass grafts. The feasibility of using this test is evaluated on this study.

METHODS: Eighty-eight bypasses on 27 patients who underwent off pump coronary artery bypass graft were evaluated by Electron Beam Coronary Angiography with an Imatron C150 ultrafast scanner, using Ioversol 350 as contrast material injected in an antecubital vein, CT angiography was performed in 3 mm single slice mode with 40% of the ECG gating. An average of 3.2 grafts per patient with mean follow up of 20.3 months. In addition ten patients with a minimum of 5 years follow up (average 7.8 yrs) were evaluated in the same fashion and compared with cardiac catheterization to determine the degree of accuracy on determining deterioration of bypasses.

RESULTS: Four grafts in the initial group were not visualized and therefore considered occluded for a patency rate of 96.5%. On the second group of ten patients there was enough information to have good correlation with the angiogram on the body of the vein bypasses however there was no good correlation with the anastomotic site or on internal thoracic grafts.

CONCLUSIONS: Electron Beam Coronary Angiography appears to be a promising minimally invasive procedure to determine patency. It is safe and accepted by the majority of patients. It may be used for long term follow up of vein bypasses. However at the present time it does not provide enough information about the anastomotic site.

MP8 RIGHT INTERNAL MAMMARY AND RADIAL ARTERY COMPOSIT CONDUIT IN CORONARY BYPASS SURGERY

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OBJECTIVE: This study is conducted to explore the feasibility of using Proximal one inch of the right internal mammary artery (RIMA) with radial artery (RA) as a composite graft, while preserving distal 2/3rd of RIMA to leave the sternal blood supply intact.

METHODS: Twenty six patients underwent coronary artery bypass grafting (CABG) using proximal one inch of the right IMA and radial artery (RA) composite graft as one of the bypass conduit. The distal 2/3rd of RIMA was left undisturbed. The graft free flows of composite graft and LIMA graft, and the length of the composite graft has been measured. The composite graft patency was evaluated postoperatively by echo and colour Doppler and by selective angiography of RIMA.

RESULTS: There was no hospital mortality and none developed sternal wound infection. The vessels grafted were distal right coronary artery (n=11), posterior descending artery (n = 12) and obtuse marginal branches (n = 3). The mean graft free flows of RIMA + RA composite graft was 99.78 ± 17.06 ml/min compared to LIMA flows of 54.22 ± 9.26 ml/min. Thirteen patients, who had good echo-window, showed patent composite graft when evaluated by 2-D echo and color Doppler. In six patients the composite graft patency was evaluated by selective angiography showed patent graft in all patients

CONCLUSIONS: Proximal RIMA and radial artery pedicle composite graft was safe, has the length to reach any coronary branch. It has a separate inflow, in comparison with LIMA and Radial T,Y grafts. It also preserves the blood flow to the Body of the sternum. This graft could potentially be advantageous in diabetics, obese, elderly and COPD patients who are shown to have increased incidence of sternal wound infection if bilateral mammaries are used.

MP9 TOTAL ARTERIAL OPCAB IN THE ELDERLY: SHORT-TERM OUTCOME

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OBJECTIVE: Off-pump coronary surgery (OPCAB) proved to be beneficial especially in the elderly; nevertheless, advantages of total arterial myocardial revascularization in this group of patients is still debated.

METHODS: We enrolled 60 consecutive patients of age >70 years (mean = 76±4 yrs.) undergoing off-pump total arterial myocardial revascularization with composite grafts. There were 38 males (63,3%) and 22 females (36,7%); mean Euroscore was 7,4±4; redo surgery was performed in 2 pts. (3,3%). Arterial conduits were used as follows: 60 LITA, 20 RITA, 41 Radial Artery (RA) in Y- or T-grafts.

RESULTS: No patient required conversion to CPB. Mean number of anastomoses was 2,1±0,6; mean ventilation time was 7±4 hrs. ; mean ICU stay was 24±6 hrs. ; mean post-operative stay was 4±1 days. Atrial fibrillation occurred in 6 pts. (10%). There were no post-operative myocardial infarction nor neurological complications. No patient required surgical revision for bleeding nor received allogenic blood transfusion. Hospital mortality was 1,6% (1 pt.). At 4 months post-operatively all the patients are alive and free from angina; angiographic controls showed 100% patency for LITA and RITA and 97,6% patency for Radial artery (1 occluded graft).

CONCLUSIONS: Off-pump total arterial myocardial revascularization with composite grafts provided excellent clinical outcome in the elderly, with low morbidity and mortality. OPCAB with composite arterial grafts allows surgeons to avoid any aortic manipulation thus dropping the rate of neurological complications in this high-risk population.

MP11 THREE YEARS EXPERIENCE WITH ENDOSCOPIC VEIN HARVESTING USING THE FREIBURG TECHNIQUE: A FOLLOW-UP OF 335 PATIENTS

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OBJECTIVE: In the last years endoscopic vein harvest became more popular in cardiac surgery. First studies reported reduced incidences of wound complications. Several factors limited the use of the method.

METHODS: A follow up of all patients (n = 335) that received endoscopic vein harvest for coronary bypass surgery using the Storz non-disposable system from April 1997 to March 2000 was performed to study the outcome of the new method. The data were compared to a group of patients (n = 139) operated upon using conventional vein harvest during the same time period. All patients were followed with an extensive query sheet. If needed additional information was collected by telephone interview with the patient and the family physician.

RESULTS: A follow up of >95% could be achieved. Significant differences between the 335 patients that underwent endoscopic vein harvest and 139 patients that underwent conventional vein harvest could be found. The endoscopic group reported significant less postoperative pain, significant less post-operative hematoma, less impaired leg function, less leg swelling, less leg infection, less antibiotic treatment and a higher content with the surgical result than in the conventional group. Both groups were similar regarding age, gender and risk factors. No significant differences were found regarding sensory disturbances and postoperative infarction.

CONCLUSIONS: Our data demonstrate significant advantages of our used endoscopic method. We will proceed using the endoscopic method while having no additional costs using a non-disposable system.

MP10 COMPLETE MYOCARDIAL REVASCLARIZATION WITHOUT CARDIOPULMONARY BYPASS: SEQUENCE OF DISTAL ANASTOMOSES

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OBJECTIVE: Hemodynamic stability in off pump surgery (Off CPB) is generally achieved by initially implanting the LIMA to the LAD. Problems associated with length and insufficient blood flow may adversely affect the recovery of the ischemic LV mass. Moreover Off CPB surgery has been criticized because of incomplete revascularization. To assess completeness of myocardial revascularization in Off CPB procedures a prospective study was conducted. The LIMA pedicle was harvested using cautery. Post-operatively the sequence of distal coronary anastomosis was recorded. The projected/performed grafts were compared.

METHODS: Data was collected on 100 consecutive patients. There were 97 males and 3 females, mean age was 65.22 yrs. The mean LVEF 48.77%. Six patients (pts) had 1 vessel disease (VD), 16 2VD and 78 3VD. The LAD territory was compromised in 98 pts, RCA in 81 and the CFX in 93. The surgical technique consisted in the placement of three deep pericardial sutures, creation of a right pleuro-pericardial window and the use of intermittent hypotensive anesthesia with multimodality brain monitoring. The revascularization was usually initiated in the RCA territory.

RESULTS: One pt died and there were no conversions to CPB. The first and the last anastomosis for 78 patients with 3 VD is shown in the table. A total of 378 grafts (mean = 3.8) were performed in 272 VD. The mean grafts for 3VD was 4.14, for 2VD was 2.75 and for 1VD was 1.66.

Grafted Vessel	LAD	Diag	RI	OM1	OM2	PLV	PDA/AM	RCA	Total
First Graft	8 Vein	1	1	5	9	9	23	22	78
Last Graft	67 LIMA	3	0	5	1	0	2	0	78
Grafts Performed	78	43	24	54	33	11	46	35	324

CONCLUSIONS: Operative management, and grafting the LIMA to the LAD last, provides hemodynamic stability and allows the surgeon to achieve complete myocardial revascularization.

MP12 FROM MIDCAB TO E-ACAB, THREE YEARS CLINICAL OUTCOME AFTER MINIMALLY INVASIVE CORONARY ARTERY BYPASS REVASCLARIZATION

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OBJECTIVE: Minimally Invasive Direct Coronary Artery Bypass (MIDCAB) is the method of surgical treatment in patients (pts) with lesion in left anterior descending artery (LAD). Left internal thoracic artery (LITA) is the graft of choice for LAD grafting due to excellent long-term patency. The implementation of the video-assisted LITA harvesting allowed to harvest it completely and atraumatically, to lessen chest wall trauma, and to reduce the length of minithoracotomy.

METHODS: Between June 1998 and December 2001 we performed 217 MIDCAB procedures. In all the cases the video-assisted LITA harvest was employed. The LITA-LAD anastomosis was performed through left minithoracotomy without use of the cardiopulmonary bypass. The criteria of eligibility to MIDCAB were: type B or C lesion in 6th or 7th segment of the LAD, restenosis after percutaneous transluminal coronary angioplasty (PTCA) and/or stenting.

RESULTS: There were one early and two late deaths. Baseline Canadian Cardiovascular Society (CCS) classification was 2.57 ± 0.7 versus 1.2 ± 0.7 after 30 days (p<0.001). Follow-up period was 3 to 32 months. Control coronary angiography was performed in 157 pts (72.3%). Angiographic studies showed patent LITA-LAD graft in 154 pts (98.1%). We showed a good quality of anastomosis in 150 pts (95.5%). Conversion to sternotomy (2.8%) and complications rates (4.1%) were low and did not have the influence on composite end-point (death, myocardial infarction and repeat revascularization).

CONCLUSIONS: The MIDCAB procedure is safe and effective method of treatment in patients with lesion in proximal LAD. MIDCAB with video-assisted LITA harvesting allowed to reduce operative trauma, improved the quality of anastomosis and reduced postoperative pain.