

XXV National Congress of the “Società Polispecialistica Italiana dei Giovani Chirurghi”  
13-15 June 2013, Bari, Italy

**CROSS-CLAMP TIME, MYOCARDIAL ISCHEMIA, INFLAMMATORY SYSTEM ACTIVATION  
AND THROMBIN GENERATION IN CABG PATIENTS**

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**Objective:** During cardiac operations with cardiopulmonary bypass coagulation, fibrinolytic and inflammatory systems are activated. Despite heparin administration thrombin generation occurs and it could contribute to myocardial ischemia–reperfusion injury. Aim of the study was to evaluate the influence of inflammation and coagulation activation on peri-operative myocardial damage.

**Methods:** We performed a retrospective analysis of prospectively collected data onto 48 consecutive patients underwent coronary artery bypass operations. Patients were divided in two groups (Low group: (L), 16 patients; High group: (H), 32 patients) according to the cut off value of post-operative cardiac Troponin I (cTnI) peak for the first and the second tertiles (3 picog/L). Clinical variables, activation of coagulation by means of Prothrombin Factor 1.2 (PF 1.2), activation of inflammation by means of Interleukin-6 (IL-6) and myocardial damage by means of cTnI were evaluated until post-operative day (POD) 5.

**Results:** Pre-operative variables were similar in both groups. H group patients had longer cross clamp time (68±20 vs 56±22 min; p: 0,049) and CPB time (106±23 vs 86±27 min; p:0,009). PF 1.2 values were similar in both groups but IL-6 peak values were significantly higher in group H (198,2 ±147,4 vs 401,9 ± 416; p:0,05).

**Conclusions:** Inflammatory system activation occurs in CABG patients in relation to myocardial ischemia time, indicating that not only thrombin generation plays a role in ischemia reperfusion injury.

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### MYOCARDIAL DAMAGE FOLLOWING CARDIAC SURGERY: COMPARISON BETWEEN SINGLE-DOSE CELSIOR CARDIOPLEGIC SOLUTION AND COLD BLOOD MULTI-DOSE CARDIOPLEGIA

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**Objective:** Myocardial protection during cardiac surgery can be accomplished by the use of crystalloid potassium cardioplegia or by blood potassium cardioplegia. The aim of this study was to assess the efficacy in myocardial protection of a single-dose of Celsior compared with repeated cold blood cardioplegia

**Methods:** We performed a retrospective analysis of prospectively collected data onto 137 consecutive valvular patients; after stratification by means of matching according to cross clamp and cardiopulmonary bypass time, 32 patients were retained for comparison (16 patients received Celsior and 16 patients received cold blood cardioplegia). Creatine-Kinase-mb isoform (CK-mb) and cardiac Troponin I (cTnI) release were evaluated until six days after the operation.

**Results:** Pre-operative data, aortic cross-clamp and bypass time were similar in both groups of patients. In Celsior group CK-MB and cTnI values were significantly higher from the first up to the sixth post-operative day. Peak cTnI value were  $19.4 \pm 13.4$  and  $9.7 \pm 7$  ng/mL ( $p:0.01$ ) in Celsior and Cold blood group respectively. Peak CK-MB values were  $79.6 \pm 58.8$  and  $45.9 \pm 20.6$  U/L ( $p:0.07$ ) in Celsior and Cold blood group respectively. The incidence of ventricular arrhythmias and the use of temporary pacing was similar in both groups.

**Conclusions:** Myocardial damage following complex elective cardiac operations is reduced in patients receiving Cold blood cardioplegia compared to Celsior solution. This is associated with lower incidence of arrhythmias and post-operative cTnI and CK-MB values and may reflect a better myocardial protection during cardioplegic arrest.

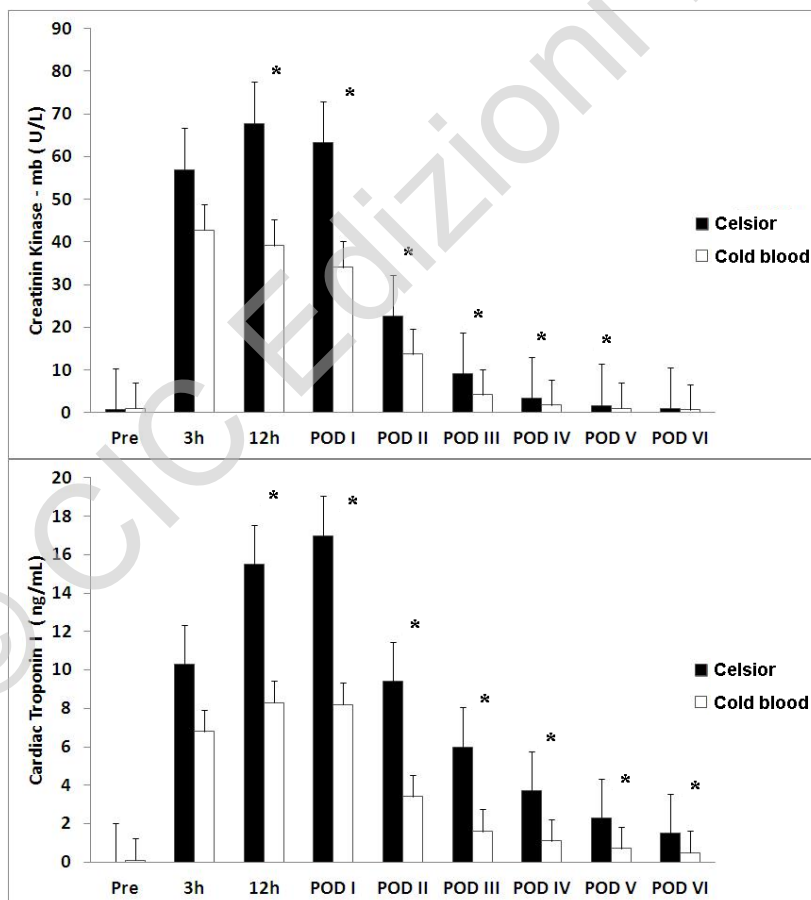


Fig. 1 - Creatine Kinase-MB and cardiac Troponin I post-operative mean values according to Celsior cardioplegia and cold blood cardioplegia administration. Pre: pre-operative; 3h: 3 hours after the end of the operation; 12 h: 12 hours after the end of the operation; POD: post-operative day. \*:  $p < 0.05$ .

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**A COMPARISON OF SHORT-TERM RESULTS BETWEEN MINIMALLY INVASIVE VALVE SURGERY VERSUS CONVENTIONAL MEDIAN STERNOTOMY**

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**Objective:** Generally cardiac valve operation were performed with conventional median sternotomy. Today less invasive approaches such as mini-sternotomy or mini thoracotomy have been developed to perform cardiac operations

**Methods:** From May 2010 to March 2013, 84 patients underwent cardiac valvular operation. Twenty-eight patients were selected for the mini-invasive procedure while in 56 patients a traditional approach was performed. A short-term follow-up was performed to compare the two approaches.

**Results:** Post-operative mortality was 0%. Two patients were converted to standard sternotomy. For aortic valve patients, the cardiopulmonary bypass time ( $115\pm 21$  vs  $91\pm 22$  min;  $p < 0.001$ ) and aortic cross-clamp time ( $100\pm 35$  vs  $69\pm 17$  min;  $p: 0.001$ ) were significantly lower in standard approach. Intensive Care Units (ICU) lengths of stay ( $28\pm 11$  vs  $59\pm 154$  hours;  $p: 0.818$ ) and hospital length of stay ( $7\pm 2$  vs  $8\pm 7$  days;  $p: 0.447$ ) were similar in the two groups. Also in mitral valve patients, cardiopulmonary bypass time ( $193\pm 50$  vs  $115\pm 39$  min;  $p < 0.001$ ) and aortic cross-clamp time ( $136\pm 19$  vs  $84\pm 28$  min;  $p < 0.001$ ) were significantly lower in standard approach. ICU ( $41\pm 26$  vs  $33\pm 15$  hours;  $p: 0.964$ ) and hospital length of stay ( $5.8\pm 1.1$  vs  $6.8\pm 3$  days;  $p: 0.407$ ) were similar in both groups

**Conclusions:** Despite longer operative times, minimally invasive approaches showed similar results for short term outcomes, and they could be considered a safe alternative to standard surgical approaches.

**MULTIBRANCHED FROZEN ELEPHANT TRUNK: THE ADVANTAGE OF LEFT SUBCLAVIAN SIDE GRAFT**

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**Objective:** Aortic debranching with frozen elephant trunk simplifies the distal anastomosis and may reduce the neurologic risk with perfusion of the left subclavian artery during HCA.

**Methods:** Three patients had an acute dissection with tear distal to the left subclavian. One had a treated chronic dissection with distal pseudoaneurysm. One had an aneurysm. A pigtail is inserted from the femoral artery. The left subclavian artery is cannulated. When the circulation is arrested, the antegrade cerebral perfusion is obtained. The left subclavian artery is ligated proximally but the vertebral artery and the spine branches are perfused. A stiff wire is inserted from the tip of the pigtail and a 15 cm endoprosthesis is deployed in an antegrade fashion (Z1 Criado). The distal anastomosis is performed more proximal including the stent. The lower body circulation is restarted through a side branch of the prosthesis. The epiaortic vessels are anastomized individually tunneling the subclavian graft into the chest.

**Results:** There was one death (acute dissection) for early rupture of the right coronary sinus and one case of temporary dialysis.

**Conclusions:** In patients that require arch and proximal descending aorta treatment under circulatory arrest, the use of a multibranched frozen elephant trunk with left subclavian side graft cannulation may facilitate the operation and reduce the neurologic risk.

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**PROPHYLACTIC BILATERAL PECTORALIS MAJOR FLAP HARVESTING AND STERNAL COVERAGE IN PATIENTS UNDERGOING MEDIAN STERNOTOMY IN CARDIAC SURGERY**

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**Objective:** Deep sternal wound infection (DSWI) is an uncommon but devastating complication of median sternotomy in cardiac surgery, associated with significant mortality and morbidity. Predicting its occurrence is essential for future prevention, in fact severe sternum infections require extended resection necessitating plastic reconstruction of the resulting defect and stabilization of the chest. Multivariable predictors for development of DSWI are old age, diabetes, previous stroke or TIA, and congestive heart failure. The use of bilateral internal thoracic artery grafts increase the risk of DSWI in patients undergoing coronary artery bypass surgery, particularly in those with congestive heart failure alone or with diabetes.

**Methods:** A retrospective analysis of all patients undergoing cardiac surgery at our institution between 2001 and 2012 was conducted. We studied the incidence of wound infections, sternal osteomyelitis and the outcome of patients undergoing bilateral pectoralis major flap harvesting on functional and cosmetic results, chest stabilization and pulmonary function.

**Results:** A model that can identify patients undergoing cardiac surgery who are at high risk for major infection is proposed. These high-risk patients may be considered for perioperative I step prophylactic intervention strategies such as bilateral pectoralis major flap harvesting and sternal coverage, to reduce rates of major infections.

**Conclusions:** Bilateral pectoralis major flap repair is a safe technique to cure severe mediastinitis necessitating complete sternal resection and we believe it can be also performed as a I step prophylactic procedure in selected patients, in order to offer better sternal coverage, increase local blood perfusion providing a multilayer anatomical barrier against infections. A routinary performance of this protocol in selected patients would lead to identical healing time, an almost uncompromised quality of life without respiratory impairment and significant reduction in the onset of later wound infection reducing hospital stay and sanitary burden.

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