

Methods: Between 1997 and 2006, 870 patients underwent MPR with MND for NSCLC, 450 patients had VMPP (Group V), and 320 were subjected to thoracotomy (Group T). Among them, we retrospectively reviewed 46 and 32 patients who underwent VMPP and MPR by thoracotomy, respectively, for cN0-pN2 NSCLC. These patients underwent postoperative chemotherapy.

Results: There were no differences between the two groups regarding preoperative data except the greatest tumour diameter (Group V vs. Group T, 30 vs. 39 mm) or regarding the number of nodes dissected. The rate of nodal metastasis (number of metastatic nodes/number of dissected nodes) was similar between the two groups (0.24 vs. 0.24 in total nodes dissected, 0.23 vs. 0.23 in mediastinal nodes dissected). The 3- and 5-year recurrence-free survivals were similar (62.1 vs. 59.4% and 52.5 vs. 45.5%). Most of the pattern of recurrence was due to remote metastasis. The 3- and 5-year survivals were similar (62.1 vs. 59.4% and 35.5 vs. 36.7%).

Conclusions: This study demonstrates that VMPP with MND is a feasible approach without loss of radicality for cN0-pN2 NSCLC. It is unnecessary to convert the VATS approach to thoracotomy in order to do MND even if pN2 disease is revealed during VMPP.

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EXOGENOUS SULFIDE REDUCES MYOCARDIAL APOPTOSIS IN RESPONSE TO ISCHAEMIA-REPERFUSION INJURY

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Objectives: Ischaemia-reperfusion (I/R) injury is often encountered clinically and results in myocardial cell death via apoptosis and necrosis. Hydrogen sulphide (H₂S) is produced endogenously in response to ischaemia and thought to be cardioprotective, although its mechanism of action is not fully known. This study investigates the cardioprotection provided by exogenous H₂S, generated as sodium sulfide, and its effects on apoptosis following myocardial I/R injury.

Methods: The mid-LAD coronary artery in Yorkshire swine (12) was occluded for 60 min, followed by reperfusion for 120 min. Controls (6) received placebo, and treatment animals (6) received sulfide 10 min prior to reperfusion. Haemodynamic, global, and regional functional measurements were obtained. Evans blue/TTC staining identified the area-at-risk (AAR) and infarction. Serum CK-MB, troponin, and Fatty-Acid-Binding-Protein (FABP) were assayed. Tissue expression of apoptosis-inducing-factor (AIF), total and cleaved caspase-3, and total and cleaved PARP were assessed via Western blotting. TUNEL staining was performed to assess apoptotic cell counts.

Results: Pre-I/R haemodynamics were similar between groups. Post-I/R, mean arterial pressure (mmHg) was reduced by 30.2±4.3 in controls vs. 8.2±6.9 in treatment animals ($P<0.05$) +LV dP/dt (mmHg/s) was reduced by 1308±435 in controls vs. 403±283 in treatment animals ($P<0.05$). Infarct size (% of AAR) in controls was 47.4±6.2% vs. 20.1±3.3% in the treated group ($P<0.05$). In treated animals, CK-MB and FABP were lower by 47.0% ($P=0.10$) and 45.1% ($P<0.05$), respectively. AIF, total caspase-3 and total PARP expression was similar between groups. Cleaved (active) caspase-3 and cleaved (active) PARP were lower by 65.4% ($P<0.05$) and 31.8% ($P=0.16$), respectively, in treated animals. TUNEL staining demonstrated significantly fewer apoptotic cells in sulfide treated animals ($P<0.05$).

Conclusions: Sodium sulfide is efficacious in reducing apoptosis and myocardial dysfunction in response to I/R injury. Exogenous sulfide may have therapeutic utility in clinical settings in which I/R injury is encountered.

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WARM ISCHAEMIA PROVOKES INFLAMMATION AND REGIONAL HYPERCOAGULABILITY WITHIN THE HEART DURING OPCAB

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Objectives: Meta-analyses suggest that off-pump coronary artery bypass (OPCAB) may increase the risk of early graft failure and preliminary studies have shown greater intracardiac thrombin formation compared to on-pump CABG. We hypothesised that obligatory periods of warm myocardial ischaemia directly relate to myocardial inflammation and thrombotic activity, causing a 'regional hypercoagulable state'.

Methods: Postoperative arterial and coronary sinus blood obtained from 60 consecutive OPCAB patients was analysed to define a transcardiac gradient for markers of myocardial injury (myoglobin), inflammation (TNF- α and IL-8) and thrombosis (thrombin generation-F1.2, contact activation pathway-FXII-a and platelet derived microparticles-via flow cytometry). Intramyocardial pH was monitored continuously during native coronary occlusion for 30 grafts ($n=11$ patients). The influence of variations in medical management that affect haemostasis (e.g. antiplatelet therapy, anti-fibrinolytics, peak ACT during heparinisation) was analysed.

Results: pH change during coronary occlusion strongly correlated with transcardiac myoglobin ($R=0.96$, $P<0.0001$). Myoglobin, in turn, showed strong correlations with the transcardiac gradients of TNF- α ($R=0.83$, $P<0.001$) and F1.2 ($R=0.72$, $P<0.0001$), and transcardiac F1.2 strongly correlated with TNF- α ($R=0.73$, $P=0.01$) and IL-8 ($R=0.51$, $P=0.02$). Patients receiving aprotinin ($n=20$) showed significantly less cardiac release of myoglobin (4.1 ± 7.5 vs. 72.9 ± 108.8 , $P=0.002$), F1.2 (31 ± 37 vs. 89 ± 149 , $P=0.03$), FXII-a (2.6 ± 4.1 vs. 19.2 ± 34 , $P=0.04$) and microparticles (7 ± 3.9 vs. 12.9 ± 8 , $P=0.01$).

Conclusions: Strong correlations between regional myocardial acidosis and the transcardiac gradients of markers for inflammation and thrombosis suggest that even brief episodes of coronary occlusion in the beating heart may have pathophysiological consequences. Aprotinin, but not other factors that influence the coagulation system, appears to mitigate this process during OPCAB.

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DO BEATING HEART TECHNIQUES APPLIED TO COMBINED VALVE AND GRAFT OPERATIONS REDUCE MYOCARDIAL DAMAGE AND INFLUENCE CLINICAL OUTCOMES?

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Objectives: We examined the outcomes of combined beating heart CABG and valve surgery (hybrid) and compared these to conventional CABG and valve surgery (conventional).

Methods: Between April 1997 and March 2006, 388 patients received combined CABG and valve surgery. Patient characteristics and cardiac enzyme release (the highest recorded CK-MB in the first 24 h) were collected prospectively. Mid-term survival was assessed using a national death registry. To account for differences in case-mix we used logistic regression to develop a propensity score for hybrid group membership (c-statistic 0.82) and then performed a propensity-matched analysis. χ^2 , Fisher's exact, and Wilcoxon rank sum tests were used as appropriate. Kaplan-Meier curves were used for mid-term survival. A P -value of <0.05 was considered significant.

Results: One hundred and forty patients underwent hybrid operation with a logistic EuroSCORE of 13.5, compared to 248 who underwent conventional operation with a logistic EuroSCORE of 10.9 ($P=0.006$). Eighty-two patients from each group were successfully matched. The logistic EuroSCORE after matching was similar between the groups (11.3 vs. 12.9; $P=0.48$). The median number of grafts per patient was also similar, three in each group ($P=0.98$). Post-op CK-MB levels were found to be significantly lower for hybrid patients ($44 \mu\text{mol/l}$ vs. $29.5 \mu\text{mol/l}$; $P=0.04$). In-hospital mortality was not statistically different (9.8 vs. 6.1%; $P=0.39$). Survival at 5-year was 74% for hybrid and 71% for conventional group ($P=0.92$).

Conclusions: CK-MB levels in patients receiving hybrid CABG and valve surgery are reduced compared to conventional CABG and valve surgery. In-hospital outcomes and mid-term survival was similar between groups.

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HYPERBARIC OXYGEN PRECONDITIONING MEDIATES CARDIOPROTECTION AND IMPROVES CLINICAL OUTCOME FOLLOWING ISCHAEMIC REPERFUSION INJURY BY AFFECTING MYOCARDIAL HSP72 AND SERUM SELECTIN EXPRESSION

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