

**SCA 137**

**XPOSE VS. PERICARDIAL STITCHES: HEMODYNAMICS IN OPCAB SURGERY COMPARING DIFFERENT EXPOSING TECHNIQUES**

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**Introduction:** One of the main issues in beating heart surgery is to accomplish stable hemodynamics during exposing of the heart for grafting coronary vessels at the inferior and lateral wall. Stabilizing systems like the Xpose® (Guidant: Menlo Park, CA; USA) suction device are offered promising better hemodynamic conditions and less mitral valve regurgitation that may occur due to heart displacement. The aim of this study was to investigate hemodynamics during OPCAB surgery comparing the Xpose® suction device (XS) versus simple pericardial stitches (PS) exposing the inferior and lateral wall of the heart.

**Methods:** 27 consecutive patients (4 female/23 male) with 3-vessel coronary artery disease were prospectively evaluated after informed consent. Mean age was 70±8 years and mean ejection fraction was 55±18%. Mean number of coronary artery anastomoses were 2.9±0.7 per patient. Hemodynamic parameters included heart rate (HR), arterial blood pressure (MAP) and central venous pressure (CVP). Also cardiac index (CI) was measured using a Swan Ganz catheter. After opening of the pericardium first data were recorded (TF). Then the patient was turned to a head-down position and baseline measurements (T0-values) were done before the heart was displaced for inferior vessel anastomosis (T0-inf.) and for lateral vessel anastomosis (T0-lat.). Measurements were repeated after displacement of the heart (T1-values): for exposing the inferior wall (T1-inf.) in 18 times and in 21 times for exposing the lateral wall (T1-lat.). Displacement of the heart was started using alternately XS or PS as the first technique for the first measurement. After measuring has been completed the heart was turned back to normal position to allow hemodynamics to recover to baseline values (T0). Then again the heart was displaced in the same position in the same patient for the second measurement using the opposite exposing technique. The use of inotropics for hemodynamic support was not necessary in any patient during coronary artery anastomosis. Last measurement was done before closure of the pericardium (TE). Also intraoperative transesophageal echocardiography (TEE) was done to detect mitral valve regurgitation (MR).

**Results:** In all patients the procedures were completed in OPCAB-technique without any perioperative complications. Values for HR showed a wide range without any significant changes at any time point of measurement or between the exposing technique. Mean values for MAP were not statistically different between TF and T0 or TF and TE. Exposure of the inferior wall (T1-inf.) went

along with a significant decrease of MAP without differences between both techniques of exposure. This decrease was even more pronounced during exposure of the lateral wall (T1-lat.) again without any difference regarding the exposing technique.

For the CVP we could not see any significant changes at any time point of measurement or between the exposing technique although there was a slightly increase during heart displacement (T1-values). No significant changes of mean CI could be found between TF- and T0-values and TF- and TE-values. The CI decreased significantly during heart displacement (T1-values) without showing significant differences regarding the inferior and lateral wall or the exposing technique.

Intraoperative TEE did not show an increase of MR during exposition of the heart except in 3 patients (1 in XS; 2 in PS).

All data are expressed in the following table as mean values and standard deviation. For statistical analysis Student's t-test including Bonferroni correction was used (significance value \*:  $p < 0.05$ ).

	HR (1/min)	MAP (mmHg)	CVP (mmHg)	CI (l/min/m <sup>2</sup> )
TF	65.2±12.8	87.9±11.6	10.3±3.3	2.81±0.46
T0-inf/XS	68.2±15.6	87.6±12.4	10.3±4.4	2.79±0.42
T0-inf/PS	67.4±13.7	88.1±10.2	10.8±3.9	2.71±0.39
T1-inf/XS	69.6±14.5	69.2±12.1*	12.5±4.0	2.08±0.43*
T1-inf/PS	70.8±14.3	68.0±12.6*	13.4±4.9	1.94±0.42*
T0-lat/XS	67.4±14.2	93.4±9.8	11.3±3.5	2.69±0.31
T0-lat/PS	68.1±12.8	92.1±11.4	10.9±4.1	2.74±0.39
T1-lat/XS	69.9±14.1	66.1±11.4*	15.1±4.1	1.93±0.59*
T1-lat/PS	70.8±15.6	67.7±11.7*	15.1±4.1	1.93±0.56*
TE	67.1±13.5	82.6±11.4	8.6±3.2	2.53±0.51

**Discussion:** OPCAB procedures are known to cause hemodynamic changes specially during the exposition of the inferior and lateral wall. Development of special stabilizing systems have been addressed to this problem. In our study exposing of the inferior and lateral wall during OPCAB procedure could be achieved with simple pericardial stitches as well as with the Xpose® suction device allowing adequate stable hemodynamic conditions. As hemodynamic parameters and degree of mitral valve regurgitation showed no significant differences the use of Xpose® did not offer any additional hemodynamic benefit on average. Only in some individual cases the use of XS seemed to be favourable improving hemodynamic situation.