

coaptation geometry and leaflet curvature during the heart cycle. Force quantification and distribution on the valve will also be evaluated.

Material and methods: The two different types of annuloplasty bands and the rigid ring will be surgically implanted and tested in an acute porcine model. Twenty animals (80kg) will be used for testing, equally distributed into 4 groups; a Duran group (flexible), a Simulus group (flexible), a Classic group (fully rigid) and a native group. Before and after ring implantation, the dynamic 3D geometry and leaflet coaptation will be assessed by sonomicrometry and by 2D echocardiography, respectively. Dedicated force transducers attached directly to the annuloplasty rings will measure annular deformational forces in the septal-lateral and commissural dimensions. A comprehensive analysis of the impact of flexible properties of the annuloplasty rings on mitral leaflet motion and stress distribution will be performed from simultaneous recordings and calculations of the mentioned parameters throughout the cardiac cycle. Results: Pending.

Conclusion: We hypothesize that the Medtronic Simulus ring, compared to the Medtronic Duran Ring, provide better support of the mitral annulus by reducing annular motion and the resulting deformational forces of mitral annulus during the cardiac cycle.

The Tricuspid Valve Annular Geometry and Dynamics –A Clinical Experiment in Pigs

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Background Tricuspid annuloplasty rings are routinely applied clinically. An optimal ring should reconstruct the valve annulus to its original configuration and adapt natural annular motion. However, there is still a lack of knowledge for a rational design. The aim of this study was to investigate the correlation between tricuspid valve annular geometry and deformational forces out-of-plane (substudy 1) and in-plane (substudy 2) using a porcine model.

Materials and methods: Two substudies were performed on fifteen pigs. In substudy one seven pigs were put on cardiopulmonary bypass. On a stopped heart fifteen sonomicrometry crystals were inserted along the tricuspid annulus (n=8), valve leaflets (n=3), papillary muscles (n=3) and at the right ventricular apex to measure three dimensional geometric changes. Data were collected before and after implantation of a flat rigid ring with four strain gauges, able to measure out-of-plane forces. In substudy two same surgical procedures was performed in eight pigs and forces in-plane were measured using a flat rigid ring with six strain gauges. All data were collected over 10 heart cycles after weaning from cardiopulmonary bypass on normal hemodynamic. Right atrial and ventricular pressure was measured concurrently.

Results: The annular configuration was found to be saddle shaped with highest points at the antero-septal and postero-lateral positions. All measured forces out of the annular plane were compressive in systole with highest force generation in the septal (2 ± 1.1 N) and posterior (1.9 ± 0.9 N) part.

Post Cardiac Surgery Arrest Mortality in ICU among 3343 Patients, a Six Year Study

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Introduction: The prevalence of post cardiac surgery arrest in adult patients is 0.7-2.9%. The main causes of cardiac arrest following cardiac surgery are ventricular fibrillation, tamponade and major bleeding. The aim of this study is to determine the mortality rate of post cardiac surgery arrest and its causes.

Method: A total of 3342 patients that have undergone cardiac surgery in Sina hospital, Isfahan, Iran between 2009-2014 were studied. Those who experienced cardiac arrest in ICU were included. Those subjects who were discharged and had arrest were excluded. The data were obtained via Sina's electronic database which is based on European association of cardiac surgery database. The statistical analyses were carried out by SPSS 16.0. Data were shown as frequency (%). For comparing qualitative variables between groups Chi square test was used. Logistic regression was used to determine single and multiple effects. The variables are sex, age, and procedure group, cause of cardiac arrest and rate of mortality.

Result: From 3342 subjects, 142 patients experienced cardiac arrest in ICU. Of 66% patients were male. The mean age is 62.3 ± 11.6 . Procedure group prevalence is CABG (70.8%), aortic valve (5.8%), mitral valve (4.4%), coronary and mitral valve replacement (8%), others (11%). The frequency of causes of cardiac arrest is ventricular fibrillation (20.9%), hypotension (26.6%), apnea (7.9%), bradycardia (37.4%), pulseless electrical activity (1.4%) and others (5.8%). The mortality rate is 71.5%. Likelihood ratio chi-square showed statistical significant between the cause of arrest and mortality rate (p-value=0.01). Bradycardia had the highest rate of mortality. Procedure group and mortality were statistically significant (p-value=0.03). The rate of mortality in CABG is 71.4%. The highest rate between procedure groups is in synchronous coronary and mitral valve replacement surgery. In order to control the confounding effect of age, sex, procedure group binary logistic regression used. Regression showed that cause of arrest had significant effect on mortality (p-value=0.1, $\beta=0.26$, Wald=6.652, OR=1.29, CI [1.06-1.58]).

Conclusion: The cause of cardiac arrest had significant relation with mortality rate in patients who underwent cardiac surgery.

Surgical Science of OPCAB.

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Background: OPCAB, though as old as coronary surgery, simplicity, low cost, better outcome and its unique life saving quality in certain cases has not become the universal operation. The reason might be the original presentation which was technical without