Effect of Afterload Reduction on Left Atrial Appendage
Tissue Velocities After Percutaneous Mitral
Commissurotomy for Mitral Stenosis

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OBJECTIVES: This study sought to investigate the relative load dependency of left atrial appendage (LAA) tissue Doppler velocities in patients (Pts) with mitral stenosis after percutaneous mitral commissurotomy (PMM).

BACKGROUND: Assessment of left atrial function is difficult and depends on loading conditions, transmural pressure gradient and left atrial intrinsic properties. In mitral stenosis, elevated resistance to blood flow through the stenotic valve is a model of increased left atrial afterload. We sought to determine the influence of the acute decrease in transmural pressure gradient after successful PMM on LAA velocity measured by tissue Doppler imaging (TDI) and LAA emptying flow velocity, respectively.

METHODS: Transoesophageal echocardiography was performed immediately before and 24 hours after PMM in 34 Pts with severe mitral stenosis (55 ± 11 years, 20 with sinus rhythm, 14 with atrial fibrillation) for measurement of LAA area, LAA emptying flow velocity, and LV systolic strain rate. Results were correlated with LAA velocities measured by TDI, and with transmitral pressure gradient and LAA emptying flow velocity increased from 23 ± 11 to 34±13 cm/s (p < 0.05).

CONCLUSIONS: Evaluation of regional left atrial function is feasible by TDI, demonstrating a triphasic pattern in LAA velocity profile. TDI parameters accurately reflect acute changes in left atrial loading conditions whereas LAA flow parameters are poorly influenced.

Myocardial Acceleration During Isovolumic Contraction:
A Load-Independent Tissue Doppler Marker of Ventricular Contractility

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Background: Myocardial acceleration during isovolumic contraction (IVA) is a tissue Doppler (TDE) measure for contractility. In animal experiments, IVA has been shown load-independent and more of a better marker of RV contractility than myocardial velocities. For clinical validation, we studied interventional device-closure of an atrial septal communication (ASD) as a model for acute intra-cardiac volume changes comparing the effect on tissue velocities and IVA. Methods: TDE was performed in 39 pediatric patients (median 6.1 ± 0.7 years). Results: Right after ASD closure, S velocities fell in all segments (table). Conclusion: IVA is a load-independent and thus a better marker of RV contractility than myocardial velocities.

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Background: Abnormal motion of the interventricular septum (IVS) is frequently observed after open heart surgery without any complication. However it is difficult to evaluate IVS motion of LV by a novel echocardiography method.

Methods: We examined 20 patients. 10 pts had coronary artery bypass grafting (non-CABG group). The other 10 pts had coronary artery bypass grafting followed by CABG surgery (CABG group). We analyzed the peak IVS motion and ejection fraction between two groups. There was significant difference in tissue Doppler velocities of IVS in the non-CABG group (table). The peak IVS motion was significantly decreased and ejection fraction was also significantly decreased in the non-CABG group.

Results: There was no significant difference in end diastolic volume, and systolic volume, and ejection fraction between two groups. There was significant difference in tissue Doppler velocities of IVS in the non-CABG group. The peak IVS motion was significantly decreased and ejection fraction was also significantly decreased in the non-CABG group.