

**1202-178 Sudden Death and Ventricular Tachycardia in Patients With Coronary Artery Disease: Is there a Role for Coronary Revascularization Without ICD Implantation?**

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**Background:** The effect of coronary revascularization (CR) on survival of pts with coronary artery disease (CAD) and ventricular tachycardia (VT) or aborted sudden cardiac death (SCD) is unknown. It is unclear whether additional medical treatment (MED) is sufficient or implantation of a defibrillator (ICD) is warranted in all these pts.

**Methods and Results:** 178 pts with CAD and VT or SCD (156 m, 22 f, age  $61.8 \pm 7.9$  yrs, ejection fraction  $40.2 \pm 15.1\%$ ) were retrospectively analyzed. All pts underwent coronary angiography and electrophysiologic (EP) study. 152 pts (85.4%) were inducible at baseline. 52 underwent CR. Of these, 19 pts had no evidence of a previous myocardial infarction (MI). After a follow-up of  $27.5 \pm 20.1$  months, total mortality (33 vs. 14.4%), cardiac mortality (26.1 vs. 10%) and SCD (15.9 vs. 0%) were all lower in the ICD group ( $p < 0.05$  each). Of pts undergoing CR, 91% were inducible before and 68% after CR. 24 pts received an ICD, 28 MED (class I  $n = 3$ ,  $\beta$ -blockers  $n = 18$ , sotalolol  $n = 4$ , amiodarone  $n = 3$ ). 14/24 pts (58%) with ICD had VT/SCD recurrence, 3/28 with MED (11%,  $p < 0.05$ ). Mortality was 2/24 (8%, 0 sudden) in the ICD vs. 7/28 (25%, 2 sudden) in the MED group ( $p = n.s.$ ). 2/19 (11%) pts (1 pt ICD, 1 pt MED) without previous MI had a VT/SCD recurrence which was fatal in the MED pt. Multivariate analysis revealed previous MI and EF  $< 40\%$  as predictors of higher mortality but not EP inducibility.

**Conclusions:** 1) The ICD significantly reduced mortality mainly by reducing SCD. 2) After CR, VT/SCD recurrence is high although reduced with additional MED. 3) Even in pts. without previous MI the high recurrence rate justifies ICD treatment in addition to CR.

**1203 Doppler Echocardiography: Evaluation of Valvular Regurgitation**

Wednesday, April 1, 1998, Noon-2:00 p.m.  
Georgia World Congress Center, West Exhibit Hall Level  
Presentation Hour: Noon-1:00 p.m.

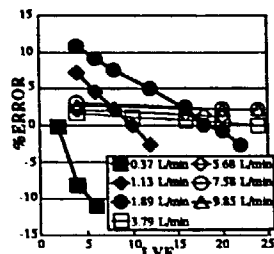
**1203-113 Utility of the Proximal Color Flow Jet Width in the Assessment of Regurgitant/Stenotic Orifices - Effect of low Velocity Filter and Comparison to Actual Vena Contracta Size: A Numerical Study**

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The proximal jet width (PJW) seen by color Doppler is felt to accurately represent the vena contracta width (VCW), the narrowest portion of the regurgitant or stenotic orifice jet area, and to be immune to factors that affect other Doppler methods. We evaluated the dependency of PJW on low velocity filter (LVF) Doppler settings and compared each PJW to actual VCW.

**Methods:** We ran steady flow (0.37-25 L/min) through 4 round orifices (diam: 1-2.5 cm, areas: 0.8-3.1 cm<sup>2</sup>) using 3D finite volume axisymmetric numerical models. Flow visualization software allowed us to measure the VCW and mimic various LVF settings (4-24 cm/sec) to measure the actual PJW at each setting.

**Results:** Graph shows results for 1.2 cm orifice showing % error between PJW and VCW for LVF settings. In low flow states with Reynolds#  $< 1000$  (0.37-1.89 L/min), optimal LVF settings are required to avoid significant over/under-estimation. In high flow states with Reynolds#  $> 1000$  (3.79-9.85 L/min) there was minimal overestimation throughout. Results were similar for all orifices considered with low flow state errors:  $\pm 15\%$ .



**Conclusions:** For low flow states, color Doppler proximal jet width (PJW) is dependent on the low velocity filter (LVF) setting chosen. Entrainment of

fluid outside jet area along with too low LVF settings causes overestimation of vena contracta width (VCW). With LVF settings set too high, flow velocities at the outer edge of the vena contracta are left out leading to underestimation of VCW. Thus, in low flow states LVF settings should be optimized to reduce errors in the estimation of severity of regurgitant and stenotic lesions using the PJW method. The effects of LVF in high flow states are minimal.

**1203-114 Color Flow Reversal in the Right Pulmonary Artery: A More Accurate Indicator of Severe Pulmonary Insufficiency**

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**Hypothesis:** Pulmonary Insufficiency (PI), is severe when diastolic flow reversal (DFR), is demonstrated by color or PW Doppler in either the left or right pulmonary arteries (RPA).

**Background:** Chronic severe PI causes right ventricular dilation and may cause RV dysfunction. In pts with severe PI after repair of Tetralogy of Fallot (TOF), pulmonary valve replacement reduces RV size and improves exercise performance. Accuracy of current Doppler methods for assessing PI severity by PI jet analysis are limited.

**Method:** Cardiac catheterization and 2D Echocardiograms in 20 pts (15 M, 5 F), with PI, were reviewed. Ten pts were sip TOF repair and 10 sip valvuloplasty for PS. Mean age was 21.4 yrs (1 to 56 yrs). Severe PI was demonstrated by angio and PA pressures at cath.

**Results:** Accuracy of DFR in the RPA, main PA, PI jet length  $> 2$  cm (PI-L), and width  $> 2/3$  PV annulus diameter (PI-W) were:

	DFR-RPA	DFR-MPA	PI-L	PI-W
Sensitivity	100%	100%	100%	67%
Specificity	90%	70%	50%	90%
P value	0.000	0.003	0.033	0.02

**Conclusion:** Color or PW Doppler flow reversal in the RPA is a more accurate indicator of severe PI than traditional PI jet features.

**1203-115 Aortic Flow Reversal: Does its Extent Distinguish the Severity of Aortic Regurgitation?**

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Aortic flow reversal has been shown to indicate the severity of aortic regurgitation, but clinically appears in patients with both moderate and severe regurgitation by other criteria. We tested the hypothesis that flow reversal in both the thoracic and abdominal aorta implies more severe aortic regurgitation than flow reversal limited to the thoracic aorta because it draws from more of the aortic capacitance. This has not been previously tested; we therefore analyzed 127 patients (69 men; 59  $\pm$  21 yr) with aortic regurgitation (67 mild, 45 Moderate, 15 severe) studied by color Doppler and 2D echo.

**Results:** Pandsiastolic flow reversal in the thoracic aorta was present in 30 patients, 19 of whom had also flow reversal in the abdominal aorta. In patients with flow reversal in the thoracic and abdominal aorta, regurgitant jet height/LV outflow tract height was higher than in those with only thoracic flow reversal ( $50 \pm 20\%$  vs.  $36 \pm 16\%$ ,  $p < 0.05$ , vs.  $25 \pm 14\%$  without flow reversal,  $p = 0.0001$ ). In the short-axis view, a jet area/LV outflow tract area ratio  $> 20\%$  was present in none of the 97 patients who did not have any flow reversal, in 1 of the 11 patients (9%) with flow reversal only in the thoracic aorta, and in 17 of the 19 patients (89%) with flow reversal extending to the abdominal aorta ( $p < 0.001$ ).

**Conclusions:** Flow reversal in the abdominal aorta implies more severe aortic regurgitation than flow reversal limited to the thoracic aorta.

**1203-116 Peak Mitral Inflow Velocity and Jet Width of the Vena Contracta as Simple Predictors of Mitral Regurgitation Severity**

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**Background:** Echocardiographic evaluation of mitral regurgitation (MR) is largely qualitative; quantitative measures of severity are laborious and seldom used. The width of the vena contracta of the MR jet and peak inflow velocity (pk E) have been shown to predict MR severity.

**Methods:** In 62 prospective pts referred to the UCSF Adult ECHO laboratory we measured jet width in the parasternal long axis (PLAX) and 4 chamber views (4C), peak mitral inflow velocity (pk E) and regurgitant fraction (RF). We correlated these variables to each other and the regurgitant fraction (RF).

W E N E S D A Y P O S T E R