dow set at 116±6 KeV, image variability and image contrast. The differences between the IOC and the control groups were compared using the Students t-test.

Results- Age, gender, ethnicity, weight and tracer dose were similar between the both groups. The image quality parameters results are given in table.

	Groups	1st image	2nd image	Change
Scatter counts	Controls	6.0 ± 3.0	6.8 ± 2.8	1.05 ± 0.4
	IOC	8.4 ± 3.0	6.4 ± 2.3	2.0 ± 1.6
	p-value	0.75	0.7	0.02
Image contrast	Controls	72 ± 11	66.8 ± 13	-3.2 ± 7.8
	IOC	73.9 ±15	81.6 ± 13	7.7± 8.2
	p-value	0.7	0.043	0.007
Image variability	Controls	17.8 ± 3.5	19 + 2.9	-1.3 ± 1.4
	IOC	17.7 ± 3.8	14.8 ± 3.5	2.9 ± 1.9
	p-value	0.9	0.008	0.0001

(Counts are in millions, mean ± SD)

Conclusion- The use of iodinated oral contrast improved image quality. This simple, safe and inexpensive clinical technique can improve 99m Tc-sestamibi MPI.

ORAL CONTRIBUTIONS

875 Three-Dimensional Echocardiography

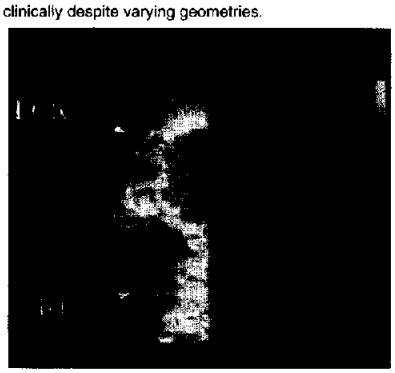
Tuesday, March 19, 2002, 4:00 p.m.-5:00 p.m.
Georgia World Congress Center, Ballroom II

4:00 p.m.

875-1 Multi-Threshold Flow 3-D Color Doppler Reconstruction of Velocity of the Flow Acceleration Region for Quantification of Mitral Regurgitation: A Chronic Animal Model Study

Xiaokui Li, Michael Jones, Xiang-Ning Li, Arthur D. Zetts, Rosemary A. Rusk, Yoshiki Mori, Crispin H. Davies, Gordon K. Mack, David J. Sahn, *Oregon Health & Science University, Portland, Oregon, NHLBI, Bethesda, Maryland.*

Background: Since mitral regurgitant orifice geometry is often quite complex, in this study we employed a scanline based digital color 3D reconstruction method that allows visualization of the flow convergence (FC) at any chosen velocity from the digital data processed offline. **Methods:** Mitral regurgitation (MR) was created in 4 sheep by chordal interruption 3-4 months before the study. During open chest study, an electromagnetic (EM) flow probe was sutured onto the mitral annulus ring to simultaneously record the transmitral flow data and was balanced against an aortic EM flow meter. Raw velocity scanline data were obtained for 180° (6° increment) rotations with a 7MHz TEE probe placed epicardially under 12 flow conditions (peak flow rate 30-130 ml/sec) obtained by volume loading, nitroprusside and angiotensin administration. The 3D data were transferred to a Silicon Graphics system to develop a multi-threshold computation to digitally reconstruct spatial FC surface for any selected velocity threshold. Direct FC surface tracings were made by computing 10-20 slices across the convergence zone. **Results:** For MR peak flow rate, there was good correlation between 3D and EM data (r=0.92, SEE=8.73 ml, p<0.05). Each measurement took 1-2 minutes. Measurements could also be integrated at 5-8 points during the heart cycle to provide the regurgitant volume. **Conclusions:** This 3D multi-threshold method could provide accurate estimation of mitral regurgitant flow clinically despite varying geometries.



4:15 p.m.

875-2 Geometric Differences of Mitral Valvular Apparatus Between Ischemic and Dilated Cardiomyopathy With Significant Mitral Regurgitation: Real-Time Three-Dimensional Echocardiography Study

Jun Kwan, Takahiro Shiota, A. Marc Gillinov, Deborah A. Agler, Jian Xin Qin, Yong Jin Kim, James D. Thomas, *The Cleveland Clinic Foundation, Cleveland, Ohio.*

Background: The aim of this study was to elucidate the geometric differences of mitral valve (MV) apparatus in patients with ischemic MR caused by posterior infarction (IMR) and functional MR due to idiopathic dilated cardiomyopathy (DCM), compared to normal control (NL) using real-time 3D echocardiography (RT3DE). **Methods:** Fourteen patients (9: posterior infarction 5: posterior and anterior infarction) with IMR, 13 patients with DCM and seven NL were studied. RT3DE volumetric images of MV apparatus were digitally transferred into a personal computer. Three different imaging long axis planes [Medial (M), Central (C) and Lateral (L),] of MV were generated at mid-systole by 3D computer software (TomTec). Commissure-commissure (CC) and septo-lateral (SL) distances were measured. Angles between annular plane and both posterior (α) and anterior mitral leaflet (β) were measured in all three planes [($M\alpha$, $C\alpha$, $L\alpha$) ($M\beta$, $C\beta$, $L\beta$)]. **Results:** In medial and central planes, α and β of both IMR and DCM significantly increased compared to NL. In lateral plane, α of both groups significantly increased, while β of IMR was not significantly different from NL.

	CC(cm)	SL(cm)	Mα(°)	Cα(°)	Lα(°)	Mβ(°)	Cβ(°)	Lβ(°)
NL	2.8±0.1	2.4±0.1	32±5	32±6	34±4	21±3	23±5	23±3
IMR	3.1±0.1^{++}	2.7±0.2^{+++}	64±8^{++}	58±9^{++}	55±7^{++}	40±5^{++}	32±8^{+}	25±6**
DCM	3.2±0.2^{++}	2.9±0.2^{++}	60±8^{++}	60±7^{++}	59±7^{++}	37±8^{++}	35±8^{++}	33±7^{++}

$^{+}$: p <0.05, $^{++}$: p <0.01 compared with NL. *: p <0.05, **: p <0.01 compared with DCM

Conclusion: Mitral annulus dilated more toward SL direction in DCM than IMR. Geometric change of MV in DCM was relatively symmetrical showing tethering of both leaflets from medial to lateral side while it was asymmetrical in IMR, showing no significant tethering of anterior leaflet laterally.

4:30 p.m.

875-3 Detection of Proximal Functional Occlusion of Three Major Coronary Arteries by Contrast-Enhanced Transesophageal Doppler Echocardiography

Masami Nishino, Shiro Hoshida, Shinichiro Suna, Masayuki Taniike, Yasuyuki Egami, Toshihiro Takeda, Ryu Shutta, Masayoshi Kawabata, Hideo Tanahashi, Jun Tanouchi, Yoshio Yamada, *Osaka Rosai Hospital, Sakai, Osaka, Japan.*

Backgrounds: Recently, transthoracic Doppler echocardiography (TTDE) has been useful for detecting coronary flow at the distal left anterior descending artery (LAD), and however, it is very difficult to detect the proximal LAD coronary flow, also left circumflex (LCX) and right coronary artery (RCA) flow using TTDE. It is clinically more important to evaluate proximal coronary lesions as compared to distal lesions. On the other hand, usefulness of Levovist to enhance various Doppler signals has been reported. Thus, in this study, we investigated whether transesophageal Doppler echocardiography (TEDE) using Levovist can evaluate coronary lesion of the proximal sites in LAD, LCX, and RCA. Methods: We studied consecutive 43 patients with suspected coronary artery disease who underwent TEDE with 5-MHz multiplane transesophageal probe after sedation by intravenous injection of a small amount of propofol. Within one week after TEDE, diagnostic coronary angiography was performed in each patient. Using TEDE, color Doppler flow mapping was detectable in 100% at proximal LAD, 79% at proximal LCX, and 72% at proximal RCA before and it was detectable in 100 % at each coronary artery after injection of Levovist (300 mg/ml in 2ml). Coronary angiogram revealed proximal LAD occlusion in two patients, proximal LCX occlusion in three patients, and proximal RCA occlusion in two patients that were all accompanied with collateral flow. In these 7 patients, contrast enhanced TEDE detected abrupt disappearance of color Doppler flow with retrograded distal flow (which supplied by collateral flow from the other coronary arteries) clearly, and these positions of abrupt disappearance of color Doppler flow correctly located the occlusion along the vessel that were shown by coronary angiogram. However, TEDE without Levovist could not detect abrupt disappearance of color Doppler flow or retrograded flow in the two occlusion lesions of LCX and in the two lesions of RCA. Conclusion: Contrast enhanced transesophageal Doppler echocardiography can detect proximal LAD, LCX and RCA functional occlusion with collateral flow accurately.

4:45 p.m.

875-4 Spatio-Temporal Brushlet Denoising Improves Real Time Three-Dimensional Calculation of Right Ventricular Function in Primary Pulmonary Hypertension Patients

Deborah R. Gersony, Elsa D. Angelini, Josh Donis, Clarito Dimayuga, Robyn J. Barst, Rola Saouaf, Marco R. Di Tullio, Andrew F. Laine, Shunichi Homma, *Columbia University, New York, New York.*

Background: Assessment of right ventricular (RV) function is clinically relevant in the follow-up of patients with primary pulmonary hypertension (PPH). No single echocardiographic approach has gained wide acceptance as being both reliable and accurate. We compared 2-dimensional (2D) and real-time three-dimensional (RT-3D) echocardiographic imaging to magnetic resonance imaging (MRI). Comparison was made both