severe ones. Clinical outcome is strongly predicted by the rate of progression, especially in mild and moderate AS. Thus, patients with a rapid pattern of progression should be followed more closely.

12:24 p.m.

1036MP-123 Can Instantaneous Changes in Aortic Valve Area During Ejection Predict Valve Area Response to Dobutamine Testing in Valvular Aortic Stenosis?

Ian G. Burwash, Luc M. Beauchaine, Karen M. Hay, Kwan-Leung Chan, University of Ottawa Heart Institute, Ottawa, Ontario, Canada.

In patients (pts) with aortic stenosis (AS), the increase in aortic valve area (AVA) during dobutamine testing has been shown to predict symptomatic status and differentiate “true” severe from “pseudo” severe AS. Recently, the instantaneous change in AVA during testing at rest has been proposed as predictive of the AVA response to dobutamine testing. In 30 pts with moderate or severe isolated AS (AVA<1.2 cm2, AI>1), we investigated whether indices of AVA dynamics during ejection at rest could predict the AVA response to dobutamine testing. Resting LV outflow tract (VOT), and transvalvular velocities (Vmax) were analyzed to determine instantaneous AVA (AVAi) and flow (Qi) at 1% time intervals during the ejection period (EP). Indices of AVA dynamics during ejection at rest were compared with the absolute change in AVA (ΔAVA), % change in AVA (%ΔAVA) and valve compliance (VC) during dobutamine testing. VC was measured as the change in AVA per change in flow (Ωme) using 6 dobutamine infusion rates (0, 1.25, 2.5, 5, 7.5 and 10 µg/kg/min).

Results: From baseline to maximum dobutamine dose in the 30 pts, AVAi increased 51% (239±24 to 361±74ml, p<0.0001) and resulted in an 18% increase in AVA (2.60±0.20 to 3.04±0.24cm², p<0.0001). VC was 0.10±0.7cm²/100mls. Pts with an AVAi increase <20% (n=17) and ≥20% (n=13) during dobutamine testing had a similar time to peak VOT (68±6 vs 41±12%EP) and Vmax (32±13 vs 32±4%EP). Time to 80% peak AVAi (20±12 vs 27±20%EP) and peak AVAi (68±28 vs 64±24%EP), time spent ≥80% of peak AVAi (61±19 vs 61±19%EP), AVAi opening rate [%AVAi to peak AVAi] (0.66±0.08 vs 0.67±0.07%EP) and %AVAi/AVAi (11±10 vs 16±10%AVAi/AVAi) were measured. There was no relationship between indices of AVA dynamics during ejection at rest and the absolute ΔAVA, %ΔAVA or VC during dobutamine testing. Conclusions: In pts with moderate and severe AS, instantaneous changes in AVAi during ejection at rest do not predict the AVAi response to dobutamine testing. Indices of AVAi dynamics during ejection at rest should not be used as a substitute for dobutamine testing in AS pts.

12:36 p.m.

1036MP-124 Left Ventricular Longitudinal Shortening in Patients With Aortic Stenosis: Relationship With Symptomatic Status

Antonio Tongue, Philippe Pibarot, Jean G. Dumesnil, Isabelle Laforest, Claudine Therault, Louis-Gilles Durand, Quebec Heart Institute, Sainte-Foy, Quebec, Canada; Institut de recherches cliniques de Montreal, Montreal, Quebec, Canada.

Background: Symptomatic status in aortic stenosis (AS) does not always correlate to classical markers of hemodynamic severity and it has been hypothesized that other factors may be involved. In this context, we have previously observed that, whilst ejection fraction is preserved, LV longitudinal shortening (LVLiS) may be selectively decreased in patients with AS; our hypothesis was that this might be a marker of subendocardial ischemia since subendocardial myocardial fibers are oriented longitudinally.

Objective: To examine if there is a relation between LVLiS and symptoms in patients with AS.

Methods: Relevant clinical and echocardiographic variables, including LVLiS calculated using the model of Dumesnil et al. were measured in 131 consecutive patients (79 males, 52 females, mean age: 68±15 years) with at least moderate AS (Aortic Valve Area (AVA)<1.5 cm²).

Results: There were 25 asymptomatic patients and 106 symptomatic patients (exertional dyspnea 62%, resting dyspnea 25%, angina 57%, syncope 27%). In comparison to the former, the latter had a smaller AVA (0.91±0.27 vs. 1.13±0.20 cm², p<0.001), a lower LVLiS (19±12 vs. 28±9%, p=0.01), and higher incidence of coronary artery disease (52 vs 20%, p=0.008). The other variables significantly associated with symptoms were: age, previous myocardial infarction, obesity, LV mass index, LV ejection fraction, cardiac index, indexed AVA, energy loss index, and valvular resistance. However, in multivariate analysis, the only variables independently associated with symptomatic status were age (p=0.03), indexed AVA (p=0.003), and LVLiS (p=0.04). LVLiS resulted in an improvement of the overall performance for the prediction of symptoms when compared to LV ejection fraction (73 versus 65%).

Conclusion: These results suggest that LVLiS is more closely associated to changes in symptomatic status than ejection fraction and, as such, it might reflect selective subendocardial ischemia. Since symptoms are associated to progression in AS, LVLiS might also be a marker of progression in AS and thus become a useful parameter to consider for clinical decision making in these patients.

1:00 p.m.

1036MP-125 Effect of Jet Eccentricity on Functional Severity of Congenital Aortic Stenosis

Kathryn E. Richards, Dimitri Deserrano, Neil L. Greenberg, James D. Thomas, Mario J. Garcia, The Cleveland Clinic Foundation, Cleveland, Ohio.

Background: In patients with congenital aortic stenosis, Doppler derived pressure gradients and symptoms are often higher than expected for the apparent anatomic orifice area. We hypothesized that this discrepancy could be caused by higher pressure loss (kinetic energy) due to jet eccentricity and wall collision.

Methods: Using computational fluid dynamics (CFD) and parameters observed in clinical aortic stenosis, we performed 16 flow simulations with varying degree of jet eccentricity, from 0 to 25° (deviation from the centadine). The orifice area was kept constant at 0.8 cm². The pressure drop across the aortic valve was changed from 30 to 75 mmHg, corresponding to stroke volume of 39 to 63 ml/beat.

Results: Pressure losses for different stroke volumes as a function of eccentricity are displayed in the graph below. The non-linear behavior is due to the impact of the jet on the wall for a rotation greater than 5° (this value is dependent on the geometry of the aortic root).

Conclusions: Jet eccentricity increases pressure loss in a simulated model of aortic stenosis. This phenomenon may explain why some patients with congenital aortic stenosis with moderate reduction in anatomic valve area have higher than expected pressure gradients and symptoms.

1:15 p.m.