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ECHOCARDIOGRAPHIC PREDICTORS OF IMPROVEMENT IN LEFT VENTRICULAR FUNCTION AFTER TRANSCATHETER AORTIC VALVE REPLACEMENT

Poster Contributions

Poster Hall B1

Saturday, March 14, 2015, 10:00 a.m.-10:45 a.m.

Session Title: Coronary I

Abstract Category: 30. TCT@ACC-i2: Aortic Valve Disease

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Background: Severe aortic stenosis and increased afterload result in left ventricular remodeling with increased muscle thickness and diastolic dysfunction. Eventually the left ventricle can no longer reduce wall stress by muscle thickening resulting in afterload mismatch and a reduction in ejection fraction (EF). Studies have shown that higher afterload (impedance) is associated with a reduced EF. However, in patients with low EF not solely due to aortic stenosis, we expect lower baseline impedance to EF ratio than in patients with reduced EF from severe aortic stenosis. The former group does not show an improvement in EF post TAVR compared to the latter.

Methods: 103 patients with an EF of <50% received an Edwards Sapien valve via transcatheter aortic valve replacement (TAVR) at our institution from May 2007 to May 2013. A baseline echocardiogram performed prior to receiving the valve along with a follow up echocardiogram performed 3 to 40 days after receiving the valve were evaluated. Systemic arterial compliance (SAC), Impedance (Zva), and wall tension (T) were measured. A ratio of wall tension to ejection fraction and a ratio of impedance to ejection fraction were also measured.

Results: Measurements on echocardiogram before TAVR and at follow up were performed in 97 patients. 36 patients (37%) showed either a reduction (14 patients) or unchanged (22 patients) EF at follow up. 61 (63%) showed an improvement in EF on follow up echocardiogram. As expected, there was a decrease in impedance and tension post TAVR. Impedance to EF ratio prior to TAVR was higher in patients with an improvement in EF at follow up compared to those without an improvement (0.15 vs. 0.13, $p < 0.05$). All patients with impedance to EF ratio more than 0.23 showed an improvement in EF post TAVR (9 patients).

Conclusion: In patients with left ventricular dysfunction, Impedance to EF ratio before TAVR may help distinguish those who will show an improvement in EF after TAVR from those who will not. We hypothesize that patients with lower impedance to EF ratio at baseline have a low EF not solely due to aortic stenosis and increased afterload, and therefore EF will not improve after TAVR.