
eComment: Valve prosthesis-patient mismatch: hemodynamic, echocardiographic and clinical consequences

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Pisano et al. [1] describe a difficult group of patients requiring a mechanical valve, but having a small calcified aortic root, making a root enlarging procedure potentially hazardous. Their methods and conclusions raise a number of issues.

The effective orifice area (EOA) was calculated using the continuity equation method [2]: EOA = (LV outflow cross-section area) × (subvalvular flow/supravalvular flow). This means that the cardiac output is an important factor. With no documentation of cardiac output assessment pre- and post-dobutamine stress testing, interpretation of the EOA is difficult. The use of heart rate, although useful, does not directly correlate with increased cardiac output due to the shortening of diastole, and the diastolic dysfunction that is virtually universal in patients with aortic valve disease.

Doppler is notoriously inaccurate in patients with atrial fibrillation. The number of patients that had this pre- and postoperatively at the time of investigation was unspecified in the manuscript. Atrial fibrillation is associated with left ventricular hypertrophy, making it a potentially important confounding factor [3], as the effects on regression are unknown.

Left ventricular mass regression is not just dependent on aortic stenosis, but also the presence of systemic hypertension, and the stage of valve disease. As half the patients were hypertensive, were these the ones that had LV regression due to their hypertension being adequately managed postoperatively?

Even in the presence of patient-prosthesis mismatch, patients with normal left ventricular function will have left ventricular mass regression as the ventricle is being off-loaded, even if not adequately.

Patient-prosthesis mismatch in the small annulus is potentially critical in patients with poor ventricular function, and suggesting such extrapolation of data from patients with good ventricular function may be premature.

References