Valve Disease/Pericardial Disease/Cardiomyopathy

Abstract 91 Table 1  Scoring system used to analyse ICE/TTE. It is imperative to be able to see SAM of the mitral valve to know the location of target myocardium. Being able to see this myocardium and other adjacent structures that may be closely linked in vascular supply allows the operator to comment on suitability for alcohol injection.

Domain 1: Mitral valve and systolic anterior motion

Score Observation
2 Able to determine SAM – septal contact point with precision such that images could allow determination of the length of AMVL in contact with septum at maximum excursion (or if no contact – ability to measure with precision the distance from AMVL tip to septum (Analogous to parasternal long axis m-mode measurement of E-point septal separation [EPSS] distance))
1 Able to localise approximate SAM – septal contact point (or, if there is no contact with the septum, able to localise approximate anterior leaflet tip position at point of maximum excursion)
0 Unable to determine tip position of the anterior leaflet in relation to the interventricular septum

Domain 2: Target septum

Score Observation
2 Able to define endocardial border of basal ventricular septum in both RV and LV with visualisation of central intra-septal ‘fusion line’ between RV and LV. On-axis images
1 Able to define endocardial border of proximal ventricular septum in both RV and LV but no visualisation of central intra-septal ‘fusion line’ between RV and LV
0 Unable to clearly define endocardial border of one or both sides of the ventricular septum.

Domain 3: Adjacent structures; Mid septum, Right ventricular cavity, anterior papillary muscle

Score Observation
2 3 key structures
1 2 key structures
0 0 or 1 key structure

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TRANSCATHETER AORTIC VALVE IMPLANTATION IN PATIENTS WITH PRE-EXISTING CHRONIC KIDNEY DISEASE

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Introduction Transcatheter aortic valve implantation (TAVI) for symptomatic severe aortic stenosis is being increasingly undertaken in a more complex cohort of patients with multiple comorbidities. Whilst it is a safe alternative to surgical aortic valve replacement in the high-risk population, these comorbidities are often excluded from large trials. We sought to investigate the effect of chronic kidney disease (CKD) on morbidity and mortality following TAVI including patients on haemodialysis.

Methods We performed a post hoc analysis of a prospectively collected registry of all patients undergoing TAVI at our centre between 2008–12. Patients were grouped into a ‘CKD’ or a ‘No-CKD’ group (with CKD defined as patients with a baseline estimated glomerular filtration rate (eGFR) <60 mL/min/1.73 m²). Patientes requiring prior haemodialysis were included in the morbidty and mortality analysis but excluded from acute kidney injury (AKI) analysis. AKI was defined as set out in the recently updated Valve Academic Research Consortium (VARC-2) criteria. The TAVI procedure was performed using Medtronic CoreValve and Edwards LifeSciences Sapien valves and implanted using the femoral (percutaneous and surgical cut-down), axillary, subclavian, transapical and transaortic routes.

Results 118 consecutive patients underwent TAVI with 63 considered to have significant pre-existing ‘CKD’ whilst 55 did not (‘No-CKD’). 4 patients required either chronic or acute renal replacement therapy (RRT) prior to the procedure. The mean age of the population was 81.3 ± 7.7 years (mean±SD), 57.6% were males, 22.0% diabetic and the mean Logistic EuroSCORE was 20.9 ± 14.9%. The baseline eGFR was 46.8 ± 8.7 and 77.9 ± 16.5 μmol/L in the CKD and No-CKD groups respectively. Other than renal parameters, no significant baseline differences existed between the two groups. TAVI implantation predominantly involved the Medtronic CoreValve (90%) and the percutaneous transfemoral route (76%). CKD patients received less contrast than No-CKD patients (151.6 ± 62.4 vs. 195.0 ± 56.8 mL, p < 0.001). Following TAVI, in CKD and No-CKD patients respectively; AKI occurred in 23.7% and 14.5% (p = 0.455) and RRT was necessary in 8.5% and 3.6% (relative risk [95% CI] = 2.33 [0.47–11.5], p = 0.440); 30-day mortality rates were 6.3% and 1.8% (p = 0.370) and 1-year mortality rates were 17.5% and 18.2% (p = 0.919). Patients who developed AKI had a significantly increased risk of 30-day (12.5% vs. 1.1%, p = 0.029) mortality. We found the presence of diabetes (odds ratio (OR) [95% CI] = 4.58 [1.58–13.3], p = 0.005) and elevated baseline serum creatinine (OR [95% CI] = 1.02 [1.00–1.03], p = 0.026) to independently predict AKI by multivariate analysis.

Conclusions TAVI is a safe, acceptable treatment for patients with pre-existing CKD, however caution must be exercised, particularly in patients with pre-existing diabetes mellitus and elevated pre-operative serum creatinine levels as this confers a greater risk of AKI development.

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DOES INTERVENTION OF SEVERE VALVE LESIONS ALWAYS IMPROVE CARDIAC FUNCTION?

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Introduction Severe valve lesions can result in cardiac decompensiation. This study investigated the effects of surgical valvular intervention upon cardiac function assessed as peak cardiac power output (CPOmax) generation during exercise. We hypothesised that (i) cardiac function improves after valvular intervention, and (ii) those with subnormal pre-operative cardiac reserve indicative of cardiac decompensation would gain less physical and cardiac functional benefits than those with preserved pre-operative cardiac function.

Abstract 93 Table 1  Peak cardiopulmonary exercise haemodynamic and gaseous exchange data

| Variables                  | LF subgroup | HF subgroup |
|----------------------------|-------------|-------------|
|                            | Pre-op      | Post-op     | Pre-op      | Post-op     |
| CPOmax (% of Ao Ctrl)      | 6.2±6.0     | 8.5±8.6     | 8.5±8.6     | 8.5±8.6     |
| VCO2 (% of Ao Ctrl)        | 92.1±19.0   | 97.1±17.7   | 97.1±17.7   | 97.1±17.7   |
| O2 Sat (% of Ao Ctrl)      | 52.2±23.0   | 101.2±21.9  | 101.2±21.9  | 101.2±21.9  |
| CO2 (% of Ao Ctrl)         | 71.1±14.6   | 83.1±18.6   | 83.1±18.6   | 83.1±18.6   |
| MVO2 (% of Ao Ctrl)        | 72.8±13.3   | 80.0±8.0    | 80.0±8.0    | 80.0±8.0    |

Data given as mean±SD. Ao Ctrl: average, sea- & age-matched control; CO: cardiac output; CPO: cardiac power output; MAP: mean arterial pressure; SV: stroke volume; VO2: O2 consumption rate. * indicates statistically significant difference compared to pre-operative value.
Methods We compared the cardiopulmonary exercise performance and non-invasive haemodynamics of 46 consecutive patients with severe valvular disease before and after valvular intervention with reference to 101 healthy male and 139 female controls without cardiovascular disease. Cardiac and physical functional reserves were measured with standard respiratory gas analyses and CO₂ rebreathing to measure peak cardiac output and quantify peak cardiac power output (CPOmax) non-invasively during treadmill exercise. Data are given as mean ± SD and statistical significance accepted at P < 0.05.

Results The patient cohort showed no overall benefit from valvular intervention (pre-operative CPOmax 3.48 ± 1.27 W; post-operative CPOmax 3.60 ± 0.96 W, P = 0.42, n = 46). However, this comprised opposing effects upon two subgroups distinguished by a pre-operative CPOmax below (LoW subgroup) or within (HiW subgroup) the normal range defined by the control population. Thus, in the LoW subgroup CPOmax increased with valvular intervention from 2.63 ± 0.67 to 3.42 ± 0.98 W (P = 0.00014; n = 26), NYHA class improved (from 2.29 ± 0.75 to 1.65 ± 0.75, P = 0.0004), peak oxygen consumption (VO2max) increased (from 1.38 ± 0.55 to 1.56 ± 0.59 l min⁻¹, P = 0.0022), and peak flow- and cardiac pressure-generating capacities increased. In contrast, in the HiW subgroup, CPOmax decreased from 4.58 ± 0.96 to 3.84 ± 0.92 W following intervention (P = 0.00026; n = 20). NYHA classification remained unchanged, VO2max decreased (from 2.29 ± 0.72 to 1.97 ± 0.75 l min⁻¹, P = 0.005) and peak cardiac flow- and pressure-generating capacities significantly decreased (all P < 0.05) after valve intervention.

Conclusions This is the first investigation of the effects of surgical intervention upon non-invasively measured CPOmax during exercise in patients with severe valvular disease. It unexpectedly demonstrates that valvular interventions performed in routine clinical practice do not consistently improve cardiac function.

Patients with subnormal pre-operative cardiac functional reserve benefited from intervention, with significantly improved cardiac and physical fitness. Patients with normal pre-operative cardiac functional reserve generally showed decreased cardiac and physical fitness.

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Abstract 93 Figure 1

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