evidence of myocardial fibrosis (LGE) by the time of AVR, which does not regress post-operatively. Equally there is a failure of myocardial perfusion reserve to improve. This suggests that although significant LV remodelling occurs it is likely that irreversible fibrosis limits improvement in functional capacity.

Abstract 076 Table 2

	Pre-operative	Post-operative	p Value
VO2 (ml/kg)	15.4 (4.1)	16.0 (5.0)	0.24
Respiratory exchange ratio (RER)	1.1 (0.1)	1.1 (0.1)	0.62
Heart rate (% predicted)	85 (12)	88 (12)	0.08
O_2 pulse	9.8 (2.6)	9.9 (2.7)	0.77
VE/VCO_2 slope	29.2 (3.7)	29.7 (3.7)	0.38
NYHA	I=9; II=32; III=5	I=35; II=7; III=1	0.03*
NT-proBNP (Log fmol/ml)	2.20 (0.73)	2.23 (0.56)	0.70

077 OSTEOPOROSIS AND BISPHOSPHONATE'S USE ASSOCIATED WITH REDUCED PROGRESSION OF CALCIFIC AORTIC STENOSIS: RETROSPECTIVE OBSERVATIONAL SINGLE CENTRE STUDY

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Purpose Progression of Aortic Stenosis (AS) has been subject of much debate in the recent past with studies evaluating effects of statin therapy. Little is known about the factors that affect progression of AS. Recently there is a growing interest in the field of Bone modifiers reducing progression of AS. In this study we aim to study the effects of osteoporosis and bisphosphonate on progression of calcific AS.

Methods Retrospective electronic case notes of patients who had diagnosis of AS with at least two echocardiogram between 2005 and 2009 were studied. Exclusion criteria includes diagnosis of Rheumatic heart disease, bicuspid aortic valve and other significant valvular pathology. Demographics, AS severity, statin use. Peak velocity, Mean gradient, Left ventricular function were recorded. Rate of change of mean gradient (mm Hg/year) and Peak velocity (m/s/year) were then calculated from this data. Previous studies evaluating natural history of progression of AS shown that on average the rate of progression of Peak velocity across aortic valve is 0.24 m/s/year (m/s/yr). We have used this value as cut-off to identify patients in which AS has progressed. Electronic case notes were reviewed to identify osteoporotic patients on bisphosphonate during the study period.

Results N 103 Male 13 Mean Age 79.89 SD ±10.29. Patient are then divided into two groups based on diagnosis of osteoporosis (Bisphosphonate group) and Control (Non-bisphosphonate). No statistically significant differences was found in between groups in terms of demographics. Please refer to Abstract 077 table 1. Differences in rate of change of Peak velocity (m/s/yr) and mean gradient (mm Hg/yr) between the bisphosphonate and non-bisphosphonate groups were assessed using linear regression with statin status and left ventricular function included as covariates. Differences in rate of change of velocity of 0.13 m/s/year (95% CI 0.01 to 0.26), p=0.034 and in mean gradient of 2.59 m/s/year (95% CI 0.75 to 4.45), p=0.006 were demonstrated. Patient group, statin status, severity of AS and left ventricular function were included as independent variables in a logistic regression model used to discriminate between "progressors" (defined as a rate of change of velocity of >0.24 m/s/year) and "non-progressors" (≤0.24 m/s/year). The OR associated with being a progressor (Non-bisphosphonate/bisphonate group) was 4.83 (95% CI 1.63 to 14.32), p=0.006 or equivalently the RR was 2.96 (if the patient is not treated with bisphosphonates).

Abstract 077 Table 1

	Group A (patients on bisphosphonate)	Group B (control)
Total number	52	51
Male	7 (13%)	6 (12%)
Age	80.55 SD 6.89	78.89 SD 7.09
Average duration of treatment with bisphosphonate	40 months (3.33 years)	
Time interval between echo scans	25 SD 10	27 SD 9

Conclusion Our study has shown that Osteoporotic patients on Bisphosphonate have significantly decreased progression of AS. Whether this result was due to bone metabolism associated with either osteoporosis and/or bisphosphonate use needs to be clarified further in randomised control trials.

078 A RANDOMISED STUDY OF THE EFFECTS OF BI-LEAFLET PROSTHESIS ORIENTATION ON AORTIC HAEMODYNAMICS AND CORONARY FLOW VELOCITY PROFILES

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Objectives The orientation of curved bi-leaflet mechanical prosthesis has been shown to significantly affect the development of aortic sinus flow in the in vitro study. However, its clinical implication for trans-aortic pressure gradient or coronary flow dynamics remains to be defined. The present study was aimed to characterise these two haemodynamic aspects by randomising the orientation of MIRA aortic prosthesis in patients undergoing aortic valve replacement (AVR).

Methods 45 patients (58±12 years, 36 males) undergoing AVR with a MIRA prostheses were randomised to anatomic (leaflets parallel to left coronary) or anti-anatomic (leaflets perpendicular to left coronary) orientation. Echocardiography was performed at 1 week and 12 months after AVR to assess prosthesis pressure gradient, LV mass and LAD flow velocity profiles.

Results Aortic prosthesis and coronary LAD haemodynamics were analysed with respect to follow-up time and orientation by twoway ANOVA. In valve size >23 mm, prosthesis orientation did not affect valve haemodynamics, LAD flow profiles or LV mass index (all p>0.05). In valve size ≤23 mm, anti-anatomic orientation group had higher mean prosthesis pressure gradient (8.1±0.5 vs 6.3±0.5, mm Hg, p=0.023), but also a greater LAD systolic flow velocity (17.5±1.1 vs 13.8±1.4, cm/s, p=0.048) and longer LAD systolic flow duration (235±7 vs 208±9, ms, p=0.030) than those of anatomic orientation. LAD diastolic flow velocity and LV mass index did not differ between the two orientations (p>0.05).

Conclusions Anti-anatomic orientation of MIRA aortic prosthesis appears to produce more physiological LAD systolic flow profiles, which can be explained by a stronger aortic sinus vortices flow demonstrated by previous in vitro study. A greater pressure gradient in the same orientation, however, suggests the possibility of fluid dynamics across its central orifice may be insulated by the vortices flow in aortic sinus, implying a complex 3D velocity profile produced by the curved bi-leaflets prosthesis.