P101. Leaflet Curvature After Mitral Valve Repair: the Influence Of Annuloplasty Shape

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OBJECTIVES: Spatially dense surface curvature heterogeneity is a marker of stress in cardiovascular structures. We hypothesized that by reestablishing more normal leaflet geometry saddle-shaped annuloplasty will reduce leaflet curvature heterogeneity when compared to flat annuloplasty in patients undergoing mitral valve repair for P2 segment flail.

METHODS: To assess leaflet curvature heterogeneity we used real time 3D echocardiography and custom software to determine the standard error of the mean of Gaussian curvature (SEMK) continuously over the leaflet surfaces of eight patients after valve repair for P2 segment flail. Four patients had flat annuloplasty and four had saddle-shaped annuloplasty in addition to leaflet resection. Regional averages for SEMK were then calculated.

RESULTS: Overall valve heterogeneity of Gaussian curvature was greatest in flat versus saddle annuloplasty (1.63±0.67mm-1 vs. 1.02±0.51mm-1, p=0.001). This difference was most prominent on the posterior leaflet. Regional analysis demonstrated decreased SEMK in P2 and P3 segments after saddle-shaped repair (1.26±0.66mm-1 and 0.78±0.43mm-1), compared to flat repair (2.33±0.79mm-1, p=0.08 and 1.42±0.3mm-1, p=0.056).

CONCLUSIONS: Saddle-shaped annuloplasty produces a leaflet curvature profile in the P2 and P3 regions that is consistent with reduced stress when compared to flat annuloplasty.

	Flat	Saddle	p
valve	1.63 ± 0.67	1.02 ± 0.51*	0.001
anterior leaflet	1.44 ± 0.56	1.06 ± 0.51	0.09
posterior leaflet	1.81 ± 0.75	0.97 ± 0.53*	0.007
P1	1.69 ± 0.86	0.89 ± 0.47	0.17
P2	2.33 ± 0.79	1.26 ± 0.66	0.084
P3	1.42 ± 0.3	0.78 ± 0.43	0.056