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Impact of different techniques for mitral valve repair on left ventricular function: a 2D/3D echocardiographic analysis

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Aim: Different surgical techniques are available for mitral valve (MV) repair in patients with degenerative severe mitral regurgitation (MR). Leaflet resection (LR) and neochordoplasty (NP), both including ring annuloplasty (RA), are the most frequently performed techniques for posterior mitral leaflet prolapse/flail repair. Despite NP technique is supposed to preserve LV physiology more than LR, it is unclear which technique provides the best haemodynamic pattern. In the present study, the results of the two different surgical techniques in terms of left ventricular (LV) dimension and function are investigated.

Methods: 23 consecutive patients who underwent MV surgical repair were enrolled. All patients underwent, before surgery and after 8 ± 2 months, 2D and 3D echocardiography with automatic (Heart Model, Philips) assessment of LV volumes and ejection fraction (EF), left atrial (LA) volume, right ventricular (RV) dimension and function, pulmonary artery systolic pressure (PASP), MR, tricuspid regurgitation (TR) and MVPG quantification. MR was corrected using 1) NP with polytetrafluoroethylene sutures and 2) triangular LR, both with RA. Patients were divided in 2 groups according to the surgical technique. Results: techniques were able to successfully correct MR. There were no significant differences in baseline echocardiogram and demographic characteristics between the two groups. There were no significant differences in terms of post-surgical MVPG between the two groups. In all patients a trend in reduction in LV dimension at follow-up was observed, but it was statistically significant only in NP patients (pre-surgical EDV 150 ± 41 VS post-surgical EDV 100 ± 27 ml, p = 0.03).

Conclusions: Both MV repair techniques showed a successful MV repair and an improvement in LV volumes at follow-up, especially in NP group. Further perspective studies are necessary to demonstrate the hypothesis of more physiological haemodynamic pattern associated with NP techniques.

Echo parameters pre VS post MV Repair

Parameter	pre	post	p value
LVEDV RN (ml)	150 ± 41	100 ± 27	0.03
LVESV RN (ml)	58 ± 20	46 ± 14	NS
LVEF RN (%)	58 ± 8	55 ± 7	NS
LVEDV RR (ml)	160 ± 58	118 ± 31	NS
LVESV RR (ml)	62 ±11	51 ±13	NS
LVEF RR (%)	59 ± 8	57 ± 4	NS

EDV: end-diastolic volume, ESV: end-systolic volume, EF: ejection fraction, RN = Ring + Neochordae; RR= Ring + Resect.