Risk factors of persistent ventricular arrhythmias after mitral valve repair in Barlow disease patients: six-year follow-up

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Introduction: Improvement in malignant ventricular arrhythmias (VA) has been reported after mitral valve surgery in some mitral valve prolapse patients (MVP) with severe degenerative mitral regurgitation. Mitral annular disjunction, posterior systolic curling, and mitral annular abnormal contractility are associated with arrhythmic MVP and underwent correction during the mitral valve repair. However, mitral valve disease progression and ventricular arrhythmic substrates (left ventricular fibrosis of papillary muscles and basal posterior wall) could be potential substrates for persistent malignant arrhythmias even after surgical correction.

Our aim was to evaluate the risk factors of persistent VA after mitral valve repair in Barlow's disease patients in six-year follow-up.

Methods: 30 consecutive patients (mean age 53.1 ± 9.4, 47% male) who underwent mitral valve repair for severe mitral regurgitation (MR) due to mitral valve prolapse were enrolled in our observational, prospective, single-center study. Resected abnormal segments of the mitral leaflets were examined by experienced pathologists for signs of myxomatous degeneration. Transthoracic echocardiography and 24-hour Holter monitoring were performed pre- and postoperatively annually. PVCs and nonsustained ventricular tachycardia (VT) runs were reviewed.

Results: All patients survived the operation. There was only one sudden cardiac death on sixth year of follow-up. During 173 person-years of follow-up 3 patients (10%) had developed recurrent moderate to severe (≥2) MR. The total number of PVCs and non-sustained ventricular tachycardia runs dropped significantly in 1st (p=.04, Wilcoxon matched pairs test) and 2nd (p=.03), years of postoperative follow-up.

Postoperative incidence of PVCs and VT correlated strongly with postoperative end-diastolic LV diameter (EDD rs=.69; p=.005), moderate negatively with LV ejection fraction (EF rs=-.55; p=.001).

Advanced myxomatous degeneration assessed by pathologists and MV posterior leaflet's thickness ≥5 mm after repair assessed by echocardiographer associated with postoperative PVCs and VT (rπ=.58; p=.045 and rs=.62; p=.002, respectively). Recurrent MR also strongly associated with postoperative PVCs and VT (rs=.76; p=.0018).

In univariate analysis, advanced myxomatous degeneration (p=.008), postoperative end-diastolic LV diameter (p=.001), and low EF (p=.003) were identified as risk factors of persistent PVCs/VT after surgery.

Conclusions: Advanced myxomatous degeneration assessed by pathologists or echocardiographer and postoperative left ventricular remodeling are associated with persistent malignant ventricular arrhythmias. Further investigation in larger cohorts to evaluate the association between degenerative mitral valve disease and ventricular arrhythmias is needed.