

PROGNOSTIC VALUE OF CARDIAC REMODELING PARAMETERS IN MITRAL STENOSIS PATIENTS AFTER CATHETER BALLOON MITRAL VALVULOPLASTY*Khamdamov S.K., Zufarov M.M., Im V.M.**Republican Specialized Scientific and Practical Medical Center of Surgery**named after Academician V. Vakhidov*

Echocardiographic diagnostics highlights a specific aspect of cardiac chamber remodeling that occurs as a result of hemodynamic disturbances in acquired mitral valve diseases. A deeper analysis allows the reorganization of traditional structural and geometric parameters in such a way that a new indicator emerges, which can expand their informational potential.

Objective: to study the parameters of cardiac remodeling before and after catheter balloon mitral valvuloplasty (BMV) in patients with mitral valve stenosis under echocardiographic monitoring.

Materials and methods. The study included 87 patients with mitral valve stenosis. Indications for intervention were the presence of a clinical picture of mitral stenosis, a mitral valve area of less than 1.5 cm², and a transmitral gradient greater than 10 mmHg. Contraindication for the intervention was mitral regurgitation of grade II or higher.

Echocardiographic examinations were performed on a GE Vivid S70N ultrasound system using a 515S sector probe in one- and two-dimensional modes. The normative values of the remodeling index (RI) were 3.5 for the left chambers and 1.5 for the right chambers.

Results. Echocardiographic assessment of cardiac remodeling before and after BMV demonstrated significant changes. The structural and geometric dimensions of the left atrium (LA) before surgery averaged 6.2 ± 1.16 cm, which decreased to 5.3 ± 0.85 cm after the procedure. The LA area decreased from 47.9 ± 9.47 cm² preoperatively to 24.8 ± 4.2 cm² postoperatively ($p < 0.001$). The left atrial volume index (LAVI) decreased from 90.36 ± 13.8 ml/m² to 57.62 ± 11.23 ml/m² ($p < 0.01$). The LA emptying fraction declined significantly from $22.0 \pm 4.38\%$ to $19.48 \pm 4.52\%$ ($p < 0.01$).

Left ventricular (LV) end-systolic volume (ESV) increased from 30.85 ± 8.78 ml preoperatively to 41.25 ± 2.56 ml postoperatively ($p < 0.01$). LV ejection fraction (LVEF) improved from $49.4 \pm 1.85\%$ to $56.23 \pm 5.69\%$ ($p < 0.05$). The LV remodeling index rose from 0.59 ± 0.18 to 0.89 ± 0.35 .

Right atrial (RA) parameters also improved: RA area decreased from 27.23 ± 2.16 cm² to 20.78 ± 1.65 cm² ($p < 0.01$), though not reaching control group values. The RA remodeling index declined from 1.42 ± 0.15 to 1.17 ± 0.12 . RA volume index dropped from 63.31 ± 14.71 to 46.58 ± 10.33 ($p < 0.01$).

Right ventricular (RV) indices showed significant positive changes: end-diastolic volume (EDV) increased from 38.12 ± 5.48 ml to 41.26 ± 6.23 ml ($p < 0.01$). RV ejection fraction improved from $45.7 \pm 6.23\%$ to $51.23 \pm 4.23\%$ ($p < 0.01$), although still lower than control values. The RV remodeling index increased from 1.02 ± 0.14 to 1.34 ± 0.15 ($p < 0.05$), remaining below control levels (1.69 ± 0.21).

Conclusion. Echocardiography visualizes the “spontaneous echo contrast syndrome,” which indicates blood stasis in the left atrium and the risk of thrombus formation. Intracardiac ultrasound during BMV provides better control during transeptal puncture, allowing visualization of the needle in the left atrium. Echocardiography also ensures precise monitoring of catheter and balloon positioning during angiography. In the postoperative period, echocardiography serves as an effective tool to evaluate immediate outcomes and predict long-term prognosis in patients.

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