

Morphological and Molecular Markers of Progressive Postoperative Left Ventricular Remodeling

Shipulin, Vladimir¹; Lezhnev, Alexander¹; Kazakov, Vitaliy¹; Kozlov, Boris¹; Suhodolo, Irina²; Gutor, Sergey²; Ogurkova, Oksana¹

¹Tomsk Institute of Cardiology, Tomsk, Russia; ²Siberian State Medical University, Tomsk, Russia

Objective: To reveal morphological predictors of postoperative heart remodeling in patients with ischemic cardiomyopathy (ICMP) by the data of intraoperative biopsies of myocardium and detect blood markers of chronic heart failure progressing in the late postoperative follow-up period.

Methods: The objects of the study were intraoperative biopsies of LV and RA myocardium from 138 patients with ICMP which were subjected to surgical left ventricular restoration in combination with CABG on bypass. The samples of peripheral blood were taken from 53 patient 1-2 days prior to the surgical intervention. Enzyme-linked immunoassay was used to evaluate concentration of matrix metalloproteinases (MMP) – 1,3,9 and tissue inhibitor MMP-1 in blood serum.

Results: In the postoperative period (1 year) all the patients were assigned into 2 groups: in 90 patients cavity volume, contractile LV function remained satisfactory while in 48 patients significantly decreased LV EF due to increased LV EDI was noticed. After clinical-morphological parallels of postoperative heart remodeling in patients with ICMP had been drawn it was noticed that diffuse, lymphocytic-macrophage inflammatory infiltration of myocardial stroma in combination with pronounced fibrosis, low trophic index and high values of pericapillar diffusion zone and Kernogan index of LV myocardium were the factors associated with unfavorable late outcomes of surgical treatment. The role of potential molecular markers can be given to the values of MMP-3 (>7,7 ng/ml) and MMP-9 (>102,4 ng/ml) in blood serum. The aforementioned values with almost 100% probability allow to predict an unfavorable outcome of surgical treatment in this category of patients population.

Conclusions: Thus, the aforementioned signs are morphological and blood markers of progressive postoperative LV remodeling in patients with ICMP.