Echocardiographic prediction of early systolic postoperative left ventricular failure after surgery of severe mitral regurgitation

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Introduction Early postoperative left ventricle failure (LVF) is frequent in patients with chronic severe mitral regurgitation (MR) after both valve repair and replacement. The aim of this study was to assess whether a preoperative two-dimensional echocardiography analysis may predict the LVF.

Methods Patients exclusively operated for MR were included prospectively in this study. Rest echocardiography was performed before surgery (D0), and at day 1, and day 7, including speckle tracking to assess the global longitudinal left ventricular strain (LVS). Exclusion criteria were combined surgery and uncontrolled arrhythmia. LVF was defined as LVEF<45%. A logistic regression and a multivariate linear regression were performed when appropriate, including variables with p<0.10 in a univariate analysis (ANOVA).

Results Between February 2012 and November 2014, 93 consecutive patients (age=65 years [55-74]; 56 men) underwent repair or replacement of the mitral valve for MR (median regurgitant orifice area=52.7mm², regurgitant volume=77.5mL), LVEF decrease from 65±7% at D0 to 53±11 (p<0.01) at D1 and 56±10 (p<0.01) at D7. LVF was shown in 31 patients (33%). Average postoperative change of LVEF was −14.4±9.8%.

Postoperative decrease in LVEF>20% was found in 24 patients (26%). Seven preoperative echocardiographic variables were associated with LVF in univariate analysis: LVEF, LVS, transmitral E-wave (E), transmitral A-wave (A), E/A, velocity of the tricuspid annular systolic motion and BMI. In multivariate analyses, only high LVS and low BMI were independent predictors of LVF: OR=0.65 [0.43-0.95], p=0.02, and OR=1.66 [1.24-2.5], p=0.002, respectively. Two variables were significantly related to the variation of postoperative LVEF in the multivariate model: weight (p=0.05) and LVEF (p=0.04).

Conclusion After surgical correction of MR, LVF is frequent and predicted by LVS and BMI, whereas LVEF and weight can predict LVEF variation.

The author hereby declares no conflict of interest