

SURGICAL APPROACHES IN AORTIC VALVE REPLACEMENT AND THEIR INFLUENCE ON LUNG VENTILATION, SURGICAL STRESS AND SYSTEMIC INFLAMMATORY RESPONSE

A. V. Ivanyuk, O. A. Loskutov, A. I. Yachnik, A. V. Rudenko, B. M. Todurov

Abstract

Aortic valve replacement (AVR), traditionally performed using median sternotomy, is a safe and routine procedure with low risk and excellent long-term results.

The aim of the study was to evaluate a minimally invasive J-shaped sternotomy influence on lung ventilation, surgical stress and systemic inflammatory response in comparison with traditional median sternotomy approach.

Materials and methods. 102 patients with aortic stenosis in the age between 24 and 78 years were examined: 27 women (26,5 %) and 75 men (73,5 %).

The patients have been divided into 2 groups depending on the approach type. Group 1 (median sternotomy) consisted of 54 patients (39 men (72,2 %) and 12 women (33,3 %)) in the age between 27 and 78 years (in average $54,3 \pm 13,9$ years). Group 2 (minimally invasive approach) consisted of 48 patients (36 men (66,7%) and 14 women (33,3%)) with average age of ($64,2 \pm 6,2$) years.

The examination (clinical, echocardiographic, biochemical, lung function, immunoassay etc.) was performed twice: one day before surgery and at the fifth day of postoperative period.

The average patient' stay at intensive care unit after surgery in group 1 was ($2,3 \pm 0,8$) days, in group 2 — ($1,7 \pm 0,8$) days, which resulted in a reduction of overall hospital stay.

Results. An unidirectional positive tendency to faster normalization of FEV1, FVC and VC values was observed in group 2 in comparison with group 1 patients. This was explained by partial preservation of chest and smaller tissue damage during surgery.

The study results confirmed that minimally invasive approach contributed to less systemic inflammatory response in postoperative period in comparison to median sternotomy. This was confirmed by a reduced concentrations of main inflammatory plasma cytokines: TNF-alpha — by 1,5 times, IL-6 — by 2,1 times and some acute-phase proteins: C-reactive protein — by 1,9 times and fibrinogen — by 1,2 times.

Conclusion. This study objectively confirmed the advantages of minimally invasive approach over median sternotomy during AVR surgery.

Key words: aortic valve defect, aortic stenosis, aortic insufficiency, surgery approaches, lung function, surgical stress, systemic inflammatory response.

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Anatoly V. Ivaniuk

SO «MOH of Ukraine heart institute»

Department of ischemic heart disease

and major vessels surgery

Surgeon

5a, Bratyslavskaya str, Kyiv, Ukraine

Tel.: +380 (44) 291-61-01, info@heart.kiev.ua