INTRODUCTION

For the patients with severe coronary lesions, the cardioplegia administered in anterograde manner does not offer...
adequate protection due to de fact that its distribution is not uniform intra-myocardially because of the stenosis.(1) In the literature, the retrograde administration of the cardioplegia is indicated in the patients with multiple and severe stenotic lesions on the coronary arteries and also in the coronary re-interventions.(2)

Recently, the data from literature mortality indicates that the retrograde administration of the cardioplegia is an independent predictive factor for mortality in coronary re-interventions.(3)

Efficacy and the safety of the retrograde administration is limited for the right ventricle.(4) The continuous retrograde administration of the cardioplegia appears to reduce the global myocardial ischemia and increases the ventricular performance.(5)

The acute myocardial infarction due to acute coronary artery occlusion determines an incomplete myocardial protection in the case of anterograde administration of cardioplegia. In these situations, the combined administration anterograde and retrograde of the cardioplegia can be an alternative solution for the myocardial protection during aortic cross clamping.

**PURPOSE**

The purpose of our work is to present the case of a patient with three vessel coronary artery disease who suffered an acute myocardial infarction complicated with acute mitral insufficiency situation in which, the myocardial protection was realized by intermittent anterograde and retrograde administration of cardioplegia with warm blood.(6)

**CASE REPORT**

A 62-year-old patient was admitted at the Interventional Cardiology with the symptomatology of acute myocardial infarction, severe chest pain and dyspnoea.

At clinical examination, there were systolic murmurs in the mitral area and the third ventricular sound, pulmonary crepitant crackles bilaterally. On ECG, there were signs of acute inferior myocardial infarction with positive values for the enzymes of myocardial necrosis. The cardiac echography (figure no. 1) reveals severe mitral insufficiency (figure no. 2) and decrease kinetics of the inferior wall of the left ventricle (figure no. 3).

The coronarography showed acute occlusion of the right coronary artery in the first segment (figure no. 4) and severe stenoses 70-80% on „left main” and left anterior descending artery (figure no. 5), circumflex artery and obtuse marginal artery (figure no. 6).

**Figure no. 1. Echocardiographic study**

**Figure no. 2. Acute mitral regurgitation echography**

**Figure no. 3. Posteroirior ventricular wall contractility dysfunction**

**Figure no. 4. Right coronary obstruction**

**Figure no. 5. Left main stenosis and anterior interventricular artery stenosis**
In the setting of this clinical status complicated with acute pulmonary edema due to the mechanical complication (acute mitral insufficiency), the patient was sent to the operating room where on the base of three coronary lesions, the acute status and the described complications, the cardioplegic solution was administered retrograde and after the coronary artery bypass grafting was done the administration was combined anterograde into the aortic root and through the grafts and retrograde through the coronary sinus. The approach to the coronary sinus was direct by the incision of the right atrial wall, so the approach of the mitral valve was done through the atrial septum. In total, cardio-pulmonary bypass (complete clamping of the venae caves on the canulas) (figure no. 7) in mild hipotermia at 33 degrees Celsius the aorta was cross clamped and 500 ml of the “calafiore” solution (warm blood with potassium) were delivered into the aortic root so anterogradely into the coronary arteries, than after it was open the right atrial wall and a catheter was inserted directly into the coronary sinus and other 500 ml of cardioplegic solution were administered retrogradely (figure no. 8).

Than the left anterior descending artery and the right coronary artery were bypassed (figure no. 9) with autologous venous grafts (if we would used internal mammary artery the operation time would have been prolonged). The obtuse marginal artery was too small and calcified so it could not be bypassed. After this was done the cardioplegia was administered combined anterogradely into the aortic root and through the grafts (500 ml) and retrogradely into the coronary sinus (500 ml) in cycles repeated on every 20 minutes during all the time of the mitral valve replacement (figure no. 10, 10”) until aortic declamping, when the heart start beating spontaneously and was weaned from extracorporeal circulation with small doses of Dobutamine (5 μg/kg/min) and Norepinephrine (180 ng/kg/min) plus intra-aortic balloon pump.

The cross aortic time was 109 minutes and the cardio-pulmonary bypass was 140 minutes. During the administration
of cardioplegia anterogradely it were determined the values of lactic acid and the markers of acidosis (ph, BE, standard bicarbonate) from coronary sinus and from cardioplegia respectively when administered retrogradely from aortic root and cardioplegia in order to compare them and to determine the efficacy of the myocardial protection in these two ways of administration. The values for lactic acid are in table no. 1.

Table no. 1. Lactic acid value

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<th>Stage</th>
<th>Input average</th>
<th>Input min</th>
<th>Input max</th>
<th>Output average</th>
<th>Output min</th>
<th>Output max</th>
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<td>4.9</td>
<td>1.5</td>
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</table>

**DISCUSSIONS**

From the table no. 1, it can be observed that the lactic acid in retrograde administration present values under 4 mmol / L compared with the first anterograde administration initial when the values are over 6 mmol / L. (the normal Astrup values determined on Cobas b 221 device are until 2.5 mmol / L). The graphic representation of the data (figure no. 11) shows a superior myocardial protection, with small values of the lactic acid, if you compare retrograde with anterograde administration.

The postoperative evolution was good the patient being extubated at 48 hours (due to acute pulmonary edema), the intra-aortic balloon pump was stopped at 72 hours and there was no need of inotropics at 4 days when the patient went on the normal ward from ICU and it was discharged home 12 days after the operation. Postoperator echocardiographic study describes normal cord recuperation (figure no. 12).

**CONCLUSIONS**

The cardioplegia solution administered anterogradely and retrogradely offers a “better” myocardial protection in the case of patients with severe coronary artery disease especially in the setting of acute myocardial infarction when that myocardial area in unprotected during aortic cross clamping only by the anterograde administration of cardioplegia.

**REFERENCES**