TECHNIQUES FOR EVALUATING THE EFFECTIVENESS OF SURGICAL MYOCARDIAL REvascularization

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Abstract – The study was conducted on a total of 98 cases with ischemic coronary disease, who had history of stable effort angina associated with old myocardial old infarction. Revascularization was performed in all cases, realized in a variable number of 1 to 4 by - bypass sites. Non-invasive preoperative assessment was made: resting ECG, ECG effort test, Holter monitoring, Doppler echocardiography, M and 2D, echo stress, scintigraphy and coronarography. In 22 cases preoperative laboratory data were correlated with histopathology examination results obtained by myocardial biopsy before the beginning of extracorporeal circulation. We made the same non-invasive laboratory investigations and coronarography (26 cases) for 3 years post surgery. Excluded from the study were cases in which the existence of left ventricle aneurysms and mitral insufficiency. In these cases in combination with myocardial revascularization was realized LV reconstruction, aneurisectomy or mitral anuloplasty. Except where coronarography was performed post surgery was made comparative analysis of efficiency of various non-invasive investigations to assess the degree of myocardial revascularization. In 43 of cases non-invasive analysis was compared with coronarography data. The study allowed the elaboration of a program to monitorize the efficiency of bypass myocardial revascularization.

Motivation and purpose of the study is evidence of increasing morbidity rate in various clinical forms of ischemic coronary disease (ICD), so as acute coronary accidents: unstable angina, myocardial infarction, and especially the chronic forms of coronary disease, to determine a concentrated effort in cardiology and cardiac surgery to optimize medical acts. There are other two certain elements that compete to rise the issue: expanding spectrum of therapeutic possibilities in the ICD and total accessibility to surgical solution. In analyze of the cases we try to find opportunities to investigate the pre-and postoperative myocardial ischemia to choice the most effective ways of myocardial protection and evaluation of various surgical techniques of myocardial revascularization.

Key words - ischemic coronary disease, surgical myocardial revascularization

1. Material and method

The analysis was conducted on a sample of 98 patients, hospitalized in the Emergency Center of Cardiovascular Diseases in period January 2006 - August 2009, selected from a total of 396 cases with coronary artery bypass graft (CABG) using extracorporeal circulation. Selection of patients wanted to ensure homogenity of the lot study. Postoperative monitoring was done over a period of 3 years. In the 98 cases was made myocardial revascularization by CABG, through extracorporeal circulation in the heart stopped, myocardial protection was provided by administration of solution cardioplegica-cold blood, in general moderate hypothermia (31°C). Have been made a variable number of by-pass aorto-coronary sites: 1 to 4 (total 294), mean age of patients 53.8 years (31 / 74 years), the situation was balanced by gender (54 men). Investigations performed pre-and postoperatively in 100% consisted of clinical examination, radiological examination, standard biological laboratory tests, ECG rest, echocardiography M, 2D and Doppler. Other investigations were conducted to a number of selected cases: echocardiography effort (28 cases pre-surgery/ 19 cases post surgery), eco stress (36 preoperative and 27 postoperative cases), myocardial scintigraphy (28 patients / 11 patients) and coronarography ± ventriculography (100% pre / 25 post surgery).

In 22 cases preoperative myocardial biopsies were taken (before extracorporeal circulation) studying the morph-hystological components of hibernation or irreversible lesions. It was evaluated surgical myocardial revascularization, the number and functionality (patency) of bypass grafts.
2. Results

Aims of the study were to improve the contractile function of LV. LVEF increased by 5-12% (35 patients) and 13-22% (28 patients) during the 3 years. LVEF is helpful in evaluating the degree of revascularization and the analysis of parietal segmentation could directly assess the degree of benefit that each brought bypass revascularize territories, if maintaining graft potency. In this issue is that of 68 patients, were recorded moderate hipochinzenie of 1-5 segments, reversed at total normochinzenie in 36 patients and in 27 patients, partial normokinesie.

In all these cases the global systolic function improved seminificativ. Cases that was analysed, directly in anostomosis-vascularized segments shows that direct benefit was recorded in cases of 185 grafts. In noticeable hipochinzenie recorded in the case of 22 patients in 37 segments, complete reversibility was noted in 13 patients, partial in 9 patients. Diastolic dysfunction with delayed relaxation presented in 24 patients was resolved in the 7 patients (in the absence of high blood pressure associated) ECG, Holter monitoring, stress test pointed out the elements of ischemia-lesion improvement in 58 from 91 patients, the disappearance of ischemia-injury at 28 patient. Stress test ECG was positive in 4 patients postoperatively. Tolerance to effort obviously improved in 72 patients (73.46%) Myocardic scintigraphy made on 17 patients of 25 examined preoperatively, an improved myocardial perfusion. Coronography reviewed in 26 cases showed in 8 patients dysfunction of grafts, who required myocardial revascularization intervention. Morpho-hysto-pathological analysis by electron microscopy performed at the "Victor Babes" by a group lead by Mr. Prof. Dr. Desiderios Lacky, confirmed the presence of variable elements of apoptosis in myocardial hibernation pre-, post-operative samples taken postextracorporeal circulation. Extracorporeal shows an amendment to the state of myocardial protection, favorable to over 73% of cases (scientific analysis was realised in a separate study).

3. Conclusions, Discussion

Analysis of collected data showed that there was a significant concordance of clinical data vs. ECG vs. echo with the significance of lesions on coronary angiography. Preoperative evaluation of sistolo-diastolic function of left ventricle is essential in establishing the indication of surgical intervention. Noninvasive investigations techniques use for postoperative evaluation showed an increased efficiency confirmed by coronary angiography in assessing the effectiveness of measures for revascularization. Echocardiographic data that confirms the existence of segmentar achieneia, postmyocardial infarction is a contraindication to achieve by-pass on those tributary vessel areas.

Hemodynamically significant coronary artery stenosis that justifies bypass graft is evident. Prezentaion of collateral vessels are a decisive argument in determining the indication for CABG. All laboratory tests can confer soledity in evaluating these patients to assess opportunities in both surgical indications and postoperative evaluation of the efficiency of the revascularization performed. Morphopathological detected issues that have prevailed in the predominantly reversible changes (hibernand infarction), and obvious aspects of cell lysis , together with evidence of irreversible (scarring, miocardosclereoza, Ca impregnations) allow the assertion of practical conclusions in coronary surgery, confirming the idea that this sechelar postinfarct myocardial areas can not benefit from revascularization procedures in the right direction Apoptosis, associated with echographyc regional akieneia and the absence of myocardial perfusion (scintigraphy) is contraindication for revascularization surgery. "Hibernating myocardium", necessarily implies the existence of offsets in the coronary circulation territory indicating a major indication for revascularization. Hypoperfusion at scintigraphy is not obligatory in according with improving systolic-diastolic myocardial function after bypass (15 patients-54%).

The reperfusion rhythm disorders (markers of reperfusion), lack of inotropic support required to stop BCP, increase tolerance to effort, rest ECG without ischemia-lesion, minimal pharmacological coronarodilatator support are elements of certainty for an efficient revascularization

4. References