Endarterectomy and reconstruction of the left anterior descending artery: early and late outcomes

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ABSTRACT

Objective: Diffuse coronary artery disease is a great problem for surgery, because it can be very difficult or even impossible to perform coronary anastomosis without removing the atherosclerotic plaque. On the other hand the removing of the plaque (i.e. endarterectomy) is considered to be a very high-risk procedure without satisfactory results because of high rate of perioperative myocardial infarction. In this article we present our experience in coronary endarterectomy (CE) with reconstruction of the left anterior descending coronary artery (LAD) in 149 patients.

Methods: We retrospectively reviewed data from 149 patients who underwent CABG with adjunctive CE and reconstruction of the LAD between 2003 and 2010 years (CE group). Another group included 68 patients who had clinical indication but were not eligible for CABG because of extensive and severe atherosclerotic lesion of distal LAD (medical group). Mean age in CE group and medical group was 59.5±8.4 and 60.2±9.9, respectively (p=0.522). Coronary artery endarterectomy was performed at the surgeon’s discretion when LAD was severely calcified or diseased, precluding the safe performance of conventional CABG. All operations involving CE were performed using cardiopulmonary bypass, moderate hypothermia (32°C to 34°C) and single aortic cross-clamping. Saphenous vein and internal mammary artery were used as grafts. Late outcomes were followed up in 127 (87.6%) patients from CE group and in 58 (85.3%) patients from medical group. Mean follow-up period in CE group and medical group was 43.3±23.9 months and 48.6±15.7 months, respectively (p=0.235).

Results: In CE group operative mortality was 2.7% (4 patients). Perioperative myocardial infarction developed in 15 (10.3%) patients. The actuarial survival rate in CE group was 89.3%. There were ten (7.9%) late deaths. In medical group, 17 (29.3%) cardiac deaths during the follow-up (p<0.001). 3 patients in CE group and 5 in medical group had myocardial infarction (2.6% vs 8.6%, respectively, p=0.121). 5 (4.3%) patients in CE group had new onset angina pectoris. Angiography was performed in 52 (44.4%) patients, mean 50.2±22.9 months after operation. Patency of arterial grafts was 51 (98.1%), venous grafts – 77 (93.9%), graft with a narrowing less than 50% – 3 (3.7%).

Conclusions: Our results demonstrate that in the current era of cardiac surgery CE is safer than it was previously thought and can be used effectively to achieve complete revascularization in high-risk patients. Thus, complete revascularization of diffuse lesions of LAD can be accomplished by adjunct endarterectomy without additional morbidity or mortality and with satisfactory functional results.

Comment by Professor Oleg Zverev

Bogdan A. P. and colleagues in their paper presented excellent early and long-term results in a high risk group of patients suffering from diffuse coronary artery disease who underwent coronary endarterectomy from the left anterior descending coronary artery in addition to coronary artery bypass grafting surgery. They examined the early and late outcomes of CABG with endarterectomy compared to medical treatment. The study included a sufficiently large number of patients, most of them were followed-up for five or more years postoperatively, statistical analysis was unexceptionable. The results of the study seems to show strong evidence of validity of coronary endarterectomy in addition to coronary artery bypass grafting surgery in patients with diffuse coronary lesions in the modern era of cardiac surgery.
Results of surgical treatment of severe pulmonary emphysema in dependence on the age of the patients

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ABSTRACT

Objective: In the absence of any opportunities for lung transplantation, surgical reduction of the lung volume (LVRS) remains the only surgical method to correct dyspnea in severe pulmonary emphysema. Selection criteria for patients with high risk of complications after LVRS have been clearly defined by the result of several randomized multicenter trials. This article deals with the results of surgical intervention in patients divided in two groups according to their age (younger and older than 40 years), including young patients at high risk of complications by NETT criteria.

Methods: We analyzed the results of examination and LVRS treatment of 123 patients with diagnosed diffuse emphysema and 3-4 grade of dyspnea according to MMRC scale. Patients were divided into two groups according to the age at the time of admittance to the hospital: younger than 40 years (group A - 9 patients), 40 years and older (group B - 114 patients). Examination of patients in group A revealed: FEV1 17.88±2.21% predicted (864±122ml), RV 368,44 ± 67,03% predicted, DL (CO) 29.11±3.22% predicted; in group B: FEV1 28.65±9.63% predicted (1090±231ml), RV 241.18±45.55% predicted, DL (CO) 33,09±14.14% predicted. During CT examinations, we founded out predominant localization of emphysema in lower lobes in seven patients in group A (78%). In group B, in 82 patients (72%) emphysema was determined predominantly in the upper lobes of both lungs (p=0.004).

Results: In group A, we observed complications in 11.1%, in group B – in 42.2% of patients (p=0.056). Postoperative mortality was determined only in group B (8 patients, 7.0%), p=0.534. During the first year after surgery in group A, only one of the operated patients (11.1%) was repeatedly admitted for hospital because of exacerbation of infectious origin, in group B - in 14 patients (12.2%), p=0.401. In group A, in six (66.7%) operated patients the grade of dyspnea according to MMRC scale decreased for more than one grade in the first months after surgery, in group B - in 30 patients (26%), p=0.015.

Conclusions: LVRS in patients younger than 40 years is characterized by a more favorable course of the postoperative period, and better long-term results when compared with patients of older age groups. Nevertheless, younger patients present more severe functional disorders, and certain criteria of high risk of postoperative complications, such as very severe decline of FEV1 and predominantly lower lobe emphysema.

Comment by Professor Sergey Lazarev

Patients with diffuse emphysema are frequently complaining on severe shortness of breath, which can be partially corrected by lung volume reduction surgery (LVRS). Selection criteria for patients with high risk of complications after LVRS have been clearly defined by the results of several randomized multicenter trials. It is well known that patients with very low FEV1 and either homogeneous emphysema or a very low carbon monoxide diffusing capacity had been found by NETT to be at high risk for death after surgery and unlikely to benefit from LVRS. But most of research works dealing with the results of LVRS, are not taking into consideration the age of the patients. Thus, it can happen that the statistical analysis of obtained data was carried out in heterogeneous groups of patients, possibly with several different diseases. As shown in a current paper, patients younger than 40 years present more severe functional disorders, and certain criteria of high risk of postoperative complications, such as very severe decline of FEV1 and diffusion capacity of the lungs, predominantly lower lobe emphysema. Authors compared results of LVRS treatment of 123 younger and older than 40 years and conclude that LVRS in patients younger than 40 years is characterized by a more favorable course of the postoperative period, and the best long-term results when compared with patients of older age groups. In the thoracic department, where LVRS is a regularly performed procedure, they can ignore some criteria of high risk of complications in young patients, and the frequency of postoperative complications remains low.