Technical features of coronary artery bypass surgery on the beating heart

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Abstract

Objective. Retrospective analysis of off-pump coronary artery bypass technique and results was done.

Method. From 2007 to 2010, 847 patients underwent coronary bypass operations on the beating heart. Authors proposed the following features of operations: high thoracic epidural anesthesia in combination with an inhalation anesthesia, routine usage of left thoracic internal artery, wide T-shape pericardiotomy, primary formation of proximal anastomoses of the aorto-coronary bypasses, stabilization of the local part of the heart in the field of placing distal anastomosis and access to the lateral and posterior surface of the heart with vacuum stabilizers, using blower-humidifier and intracoronary shunts.

Results. The artificial blood circulation was used due to an intraoperative unstable hemodynamic in 11 patients (1.3%), in 5 of them on the beating heart. In 16 patients (1.9%) resternotomy was performed in early postoperative period because of the bleeding. Cardiac complications developed in 36 patients (4.3%). Mortality was 0.8% (7 patients). An average postoperative hospital stay - 9.2±7.1 days. Technical aspects, advantages and disadvantages of the method used are discussed in the article.

Conclusion. Proposed technique is simple, safe, has good immediate results and can be recommended for coronary bypass surgery.

Editorial comment by A.Akopov

Beating heart bypass surgery is the newest and most significant advancement in cardiac surgery. Off-pump coronary artery bypass grafting (CABG) refers to CABG without the use of cardiopulmonary bypass. The major rationale for this procedure, which is also called “beating heart surgery”, is to avoid the morbidity associated with cardiopulmonary bypass (induction of a systemic inflammatory response by the bypass circuit) and of cross-clamping the aorta (risk of stroke or systemic embolization). Several studies have shown that patients who are treated with traditional bypass surgery using a heart-lung machine may suffer an increased risk of stroke, kidney failure, memory loss and blood transfusions. Beating heart bypass surgery significantly reduces those risks. Plus, multiple studies have shown that off-pump surgery results in shorter hospital stays, shorter time spent on a ventilator and less blood loss.

The off-pump technique is technically more challenging and requires additional training. It has been chosen by some practitioners for high-risk patients with contraindications to conventional CABG, such as those with extensive ascending aortic atheromatous or calcific changes which might preclude safe aortic instrumentation. A potential disadvantage of off-pump surgery is the difficulty of performing distal anastomoses on a beating heart.

Medical Military Academy is one of the most experienced sites in Russia for beating heart surgery. Their philosophy is that anyone requiring heart bypass surgery is a candidate for beating heart surgery. In article “Technical features of coronary artery bypass surgery on the beating heart” the authors present the results of 847 patients undergoing coronary bypass operations on the beating heart with a very low incidence of postoperative morbidity and mortality.