Coronary endarterectomy on beating heart

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Therefore, I made the two following observations in order to demonstrate this: (1) whether or not the CTn I level in circulating blood in a redo CABG is affected by autotransfusion of shed mediastinal blood; and (2) whether or not shed mediastinal blood contains a higher CTn I level in redo cardiac operation than that in the primary one. CTn I levels in circulating blood were obtained from 48 consecutive patients undergoing redo CABG at the time of preoperative, immediately after admission to the surgical intensive care unit, 16 hours postoperatively, and on the 2nd and 4th postoperative days. All patients received intraoperative myocardial protection with moderate body hypothermia, cold blood potassium cardioplegia, and topical ice slush. Shed mediastinal blood was collected in a reinfusion system (Pleur-evac; Deknatal, Fall River, MA). Patients with more than 400 mL of shed blood within the first 4 hours after chest closure underwent reinfusion of the shed blood. The collected shed blood was reinfused through a standard blood filter without any special management. There were 2 patients with early postoperative myocardial infarction and 1 patient with low cardiac output syndrome. Those 3 patients were excluded from the observation. In the remaining 45 patients, 19 underwent reinfusion of shed blood (group 1), while the other 26 patients did not (group 2). CTn I data were compared with a Mann-Whitney *U* test because CTn I is not distributed normally [3], while other data were analyzed by analysis of variance or student's *t* test. Differences were considered significant at a probability level less than 0.05.

There were no significant differences in age, sex, cardiac ejection fraction, cardiopulmonary bypass and aortic cross-clamp time, minimum body temperature, and number of grafts between two groups. The circulating blood CTn I levels averaged 0.0265 ± 0.0503, 0.6408 ± 0.4288, 1.6977 ± 1.2844, 1.5605 ± 0.5776, and 0.5776 ± 0.5587 μg/L in group 1, and 0.0218 ± 0.0283, 0.05161 ± 0.7547, 1.6536 ± 2.1875, 1.0873 ± 1.1204, and 0.3286 ± 0.4094 μg/L in group 2 at the time of preoperative, immediately after admission to the surgical intensive care unit, 16 hours postoperatively, and 2nd and 4th postoperative days, respectively. There were no significant differences between the two groups at all time points.

In the second observation, I measured CTn I levels in shed mediastinal blood of 15 consecutive patients accepting redo valve replacement (11 cases) or redo CABG (4 cases) (group 3) and 15 randomly selected patients undergoing primary valve replacement (11 cases) or primary CABG (4 cases) (group 4). Shed blood samples were collected 4 hours after chest closure. CTn I data were compared with a Wilcoxin nonparametric test while other data were analyzed as that in the first observation.

There were no significant differences in age, sex, cardiac ejection fraction, cardiopulmonary bypass time, and aortic cross-clamp time between the two groups, but duration of intervention in group 3 (273.4 ± 44.4 minutes) was longer than that in group 4 (203.5 ± 38.3 minutes). The shed blood CTn I levels were not significantly different between the two groups (1.4091 ± 1.5093 μg/L in group 3 and 1.2329 ± 1.1710 μg/L in group 4).

The present results of those two observations indicate: (1) CTn I levels in circulating blood are not affected by reinfusion of shed mediastinal blood in redo CABG; and (2) dissection of dense adhesions between the heart and its surrounding tissues does not significantly induce perimyocardium to liberate CTn I into shed mediastinal blood; that is, perimyocardial damage caused by dissection of adhesions in redo open heart operation using modern surgical techniques is limited.

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Reply

To the Editor:

The additional data about cardiac redo operation reported by Chen further confirm our findings that the circulating levels of troponin I are not influenced by autotransfusion of shed blood. Troponin I appears to be a sensitive marker of myocardial damage also in the immediate postoperative period of a variety of cardiac procedures.

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Coronary Endarterectomy on Beating Heart

To the Editor:

As it is known the "beating heart technique" expanded the domain of coronary artery bypass grafting in high-risk patients [1]. Later, the technique of aortocoronary bypass through a limited incision was adopted [2]. Because no extracorporeal circulation is used in this method, it is arguably the most physiologic way to achieve coronary revascularization.

Main indications for beating heart coronary bypass are severe left ventricular dysfunction, recent history of cerebrovascular accident, and chronic renal failure. In some of our patients undergoing the beating heart technique we encountered diffuse atherosclerosis of the coronary arteries necessitating endarterectomy. We decided to continue with the beating heart technique in 7 of these patients because of the presence of left ventricular dysfunction and either of the following conditions: recent history of cerebrovascular accident in 3 patients, severe chronic obstructive pulmonary disease in 2 patients (forced expiratory volume in 1 second less than the expected value despite full medical treatment), chronic renal failure, and advanced age in 2 patients. Midline sternotomy was the incision of choice. A retrocardiac sponge pad, two pericardial traction sutures on the edge of pericardium, and one proximal suture around the coronary artery were the only methods of immobilization. Two epicardial silk sutures on both sides of the artery facilitated better exposure. After the distal extent of the endarterectomy was reached, a circular suture around the coronary artery was used for better exposure and limiting the amount of bleeding. Heparin (1.5 mg/kg) was given before tightening the coronary traction sutures. Half of the heparin was neutralized

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