

Systemic Venous Flow During Cardiac Surgery Examined by Intraoperative Transesophageal Echocardiography

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Abstract

Patterns of systemic venous return change after cardiac surgery. However, the exact timing and underlying mechanisms are not well understood. To analyze these changes transesophageal echocardiography was used to evaluate 21 patients (mean age 56 +/- 17 years) during cardiac surgery. Eleven patients underwent coronary bypass grafting, 2 had ablation of accessory bundles, 4 had mitral and 4 had aortic valve replacements. All were in sinus rhythm and were undergoing their first cardiac operation. Hepatic and pulmonary venous flow, tricuspid annular motion, and signs of tricuspid regurgitation were recorded sequentially 5 times: (A) with chest closed, (B) with chest open and pericardium closed, (C) with both chest and pericardium open, (D) after cardiopulmonary bypass with chest open, and (E) after cardiopulmonary bypass with chest closed. The hepatic venous Doppler flow velocity integrals (cm) changed, from stage A to stage E: systolic flow decreased from 5.9 +/- 5.2 to 2.2 +/- 1.4 (p less than 0.01); diastolic flow increased from 3.1 +/- 1.5 to 4.8 +/- 3.3 (p less than 0.001); and systolic to diastolic ratio decreased from 2.0 +/- 1.2 to 0.7 +/- 0.6 (p less than 0.001). Reversed flow at the end of ventricular systole was present in 9 patients (43%) at stage A and in all patients at stage E. Decreased tricuspid annular motion was noted in all but 1 patient after cardiopulmonary bypass. No patient presented significant tricuspid regurgitation at any stage. In conclusion, the significant change in the pattern of systemic venous return after open heart surgery is not due to opening of the chest wall or parietal pericardium, or to tricuspid regurgitation.(ABSTRACT TRUNCATED AT 250 WORDS)