

The impact of additional epicardial imaging to transesophageal echocardiography on intraoperative detection of residual lesions in congenital heart surgery.

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Abstract

OBJECTIVE:

Transesophageal echocardiography is the primary intraoperative imaging modality used to evaluate cardiac surgery. Its predecessor, epicardial echocardiography, enables visualization of certain cardiovascular structures that are beyond the visual scope of transesophageal echocardiography. We review the current use of epicardial echocardiography to analyze its contemporary application and benefit.

METHODS:

A retrospective review of the intraoperative echocardiograms of 1204 children undergoing bypass cardiovascular surgery between January 2007 and December 2009 was performed. The incidence of epicardial echocardiography use, intraoperative revisions, and early reinterventions were analyzed.

RESULTS:

Epicardial echocardiography was performed in 7.9% of all intraoperative studies: epicardial echocardiography alone (n = 38) and transesophageal echocardiography + epicardial echocardiography (n = 57). Epicardial echocardiography alone was performed in patients with contraindications for transesophageal echocardiography. In the transesophageal echocardiography + epicardial echocardiography group, indications to obtain additional information by epicardial echocardiography were for the assessment of branch pulmonary arteries (40%), coronary arteries (28%), aortic arch/Blalock-Taussig shunt (14%), Glenn/Fontan circuit (9%), pulmonary veins/baffles (7%), and residual ventricular septal defects (1.7%). The overall intraoperative surgical revision incidence was 10.2%, consisting of 21% of the transesophageal echocardiography + epicardial echocardiography group, 5.3% of the epicardial echocardiography alone group (P = .01), and 9.8% of transesophageal echocardiography alone group (P = .02). Intraoperative revisions indicated after epicardial echocardiography were mostly related to extracardiac structures (77%), whereas they were mostly related to intracardiac structures in the transesophageal echocardiography alone group (80.7%) (P = .0002). Early reintervention was indicated mostly for pulmonary artery and Glenn obstructions, the majority (75%) with previously known stenosis or interventions on the pulmonary arteries.

CONCLUSIONS:

Epicardial echocardiography detects residual intraoperative lesions not visualized by transesophageal echocardiography, most frequently related to pulmonary arteries. Its use, in addition to standard transesophageal echocardiography, may decrease the need for early reintervention