

TITLE: IMPROVED INTRAOPERATIVE DETECTION OF INTERATRIAL SHUNTS BY TRANSESOPHAGEAL ECHOCARDIOGRAPHY**AUTHORS:** S. Konstadt MD, E. Louie MD, D. Kanuri MD, T. Rao MD, P. Scanlon MD**AFFILIATIONS:** Depts of Anesthes., and Cardiol., Loyola Univ Med Cen, Maywood, IL 60153

Previous attempts to diagnose unsuspected interatrial shunts (IAS) have yielded prevalences (10%) much lower than autopsy studies (25%).^{1,2} This study reports the use of refined contrast echocardiography (CE) and pulse-wave and color Doppler techniques (DT) to diagnose IAS.

The protocol was approved by the IRB and written informed consent was obtained from 50 patients undergoing elective cardiac surgery. A 5 MHz esophageal echocardiographic probe was used to obtain a view of the right and left atria with the interatrial septum in its thinnest cut and perpendicular to the ultrasound beam. During continuous hemodynamic recording, ten cc of saline was then vigorously agitated by exchanging it between two syringes interconnected by stopcocks and was injected into the right atrium during a brief period of apnea. Injection was deemed adequate only if the complete right atrium was opacified by the contrast, and was repeated as necessary. Identically produced agitated saline was then injected during 20 cm H₂O CPAP. When opacification of the right atrium was complete, the airway pressure was released. Under

these same physiologic conditions color and pulsed-wave DT were also performed.

11 of 50 patients (22%) demonstrated right to left passage of saline contrast across the interatrial septum. DT demonstrated right to left shunting in only 2 of the patients with positive CE studies. In two patients without CE evidence of shunting, DT demonstrated intermittent right to left shunting. Thus the combination of CE and DT identified a 26% (13/50) prevalence of IAS.

Using refined CE and DT, this study demonstrated an incidence of IAS that approximates the autopsy studies. The key modifications in our technique are the use of the biatrial view, the enhanced contrast obtained by the method of agitation, and to minimize the possibility of streamlining, the requirement that the contrast must completely opacify the right atrium. Additionally for CE to detect right to left shunts it is important to document pressure reversal (RAP>LAP) following CPAP release. One patient in this series had no reversal or shunting after release of 20 cm H₂O CPAP, but release of 30 cm H₂O CPAP resulted in pressure reversal and shunting.

REFERENCES:

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2. Hagen PT, Scholz DG, Edwards WD: Incidence and size of patent foramen ovale during the first ten decades of life: an autopsy study of 965 normal hearts. *Mayo Clin Proc* 59:17-20, 1984

A1210**TITLE:** IS CORONARY REVASCULARIZATION USING THE INTERNAL MAMMARY ARTERY CONTRAINDICATED IN PATIENTS WITH COPD?**AUTHORS:** R. McCarthy, Pharm.D., K. Tuman, M.D., A. Ivankovich, M.D.**AFFILIATION:** Anes. Dept., Rush Medical College, Chicago, Illinois 60612

Use of the internal mammary artery (IMA) as a conduit for coronary artery bypass grafting (CABG) has become increasingly popular because of better patency rates compared to saphenous vein grafts. In patients with COPD, however, its use as a pedicle graft has been questioned because of concerns about decreased graft flow because of positive pressure ventilation and large lung volumes. Despite these concerns, there are circumstances where the IMA may be used despite the presence of COPD (e.g., lack of sufficient saphenous vein, especially in younger patients). This study was undertaken to examine whether the use of the IMA as a pedicle graft for CABG was associated with any adverse outcomes in patients with COPD.

After institutional approval, we studied 1960 consecutive adults undergoing CABG. 61 patients with clinical and laboratory evidence of COPD required use of the left IMA for revascularization of the left anterior descending or circumflex coronary arteries. A cohort of age and gender-matched patients (n=61) with COPD who underwent CABG without use of the IMA during the same time period were randomly selected without knowledge of other perioperative variables. All received standard intra- and postoperative

ventilation (10-12ml/kg delivered tidal volume with avoidance of PEEP unless required for inadequate PaO₂, despite high FIO₂). Perioperative characteristics were compared between these 2 groups using Chi square and t-tests. There were no differences in age, aortic clamp time, # of coronary grafts, NYHA status, degree of LV dysfunction, left main coronary disease, diabetes, or use of beta adrenergic or calcium-entry blockers between groups. Despite a greater incidence of MI < 3mo in the IMA group (44 vs 28%), there was less postop ECG ischemia (hardcopy: 18 vs 36%). There was no difference in perioperative MI (POMI: CKMB > 40 and ECG changes) in those with or without IMA (3.3 vs 4.9%) or inhospital mortality (4.9 vs 3.3%). The incidence of dysrhythmias, low CO syndrome, or reoperation for bleeding did not differ between groups. A stepwise logistic regression model (LRM) was used to select those factors most highly related to occurrence of POMI in the overall population (n=1960) where the incidence was 5.5% (n=108). The LRM revealed that POMI was associated with prolonged aortic cross clamp times, non-use of preoperative calcium-entry and beta-adrenergic blocking drugs, recent MI (< 3 mo), unstable angina, female gender, and need for vasoactive infusions after CPB. No multivariate association of COPD or use of the IMA with the occurrence of perioperative MI could be demonstrated using the LRM. These data do not support the hypothesis that use of the IMA as a pedicle graft for coronary revascularization is associated with increased morbidity or mortality in patients with COPD.