

SCA 23

TEE-DERIVED TRANSVALVULAR GRADIENTS AND ADVERSE OUTCOME AFTER AORTIC VALVE REPLACEMENT

Jones D, Phillips-Bute B, Glower D, Mathew J, Swaminathan M
Duke University Medical Center, Durham, NC, USA

Introduction: Intraoperative transesophageal echocardiography (TEE) is an important tool in the assessment of prosthetic valvular function. Although several predictors of poor outcome after aortic valve replacement (AVR) have been identified, (1) few studies have shown the significance of intraoperative transvalvular gradients measured by TEE. Therefore, we tested the hypothesis that higher post-replacement transvalvular gradients, assessed by intraoperative TEE, are independently associated with adverse outcomes after aortic valve replacement.

Methods: With IRB approval, we retrospectively analyzed intraoperative TEE and perioperative data on patients who underwent AVR at our institution between July 2000 and July 2003. All patients had a comprehensive TEE examination performed after induction of anesthesia (baseline) and following CPB, according to prescribed SCA/ASE guidelines, including a detailed assessment of the prosthetic aortic valve. A multivariate logistic regression analysis was performed to test the independent association between post-replacement peak aortic valve gradient and major adverse cardiac events (MACE – defined as the occurrence of one or more of either death, cardiac arrest, postoperative cardiac index <2 for >24 hours, myocardial infarction, and placement of an intra-aortic balloon pump). Significance was assessed at a 05.

Results: Complete data was available on 291 patients (See table). There were a total of 16 MACEs. A high intraoperative peak aortic gradient was independently associated with MACE (p=0.0259). This relationship is shown in the figure. In addition, age (p=0.0205) was also a significant covariate in this model.

Discussion: We confirmed our hypothesis that a high intraoperative peak aortic valve gradient after AVR is independently associated with adverse postoperative outcome. This is the first time that the importance of intraoperative transvalvular gradients after AVR has been studied in such large a group of patients. One explanation is that these patients do worse because of residual left ventricular

outflow obstruction, therefore obviating the benefits of AVR. Our study is limited by its retrospective design and the fact that we had a relatively small occurrence of adverse events. These findings suggest that intraoperative TEE-derived transvalvular gradients may have a prognostic value in patients undergoing AVR, and warrant prospective investigation.

References

1. Rao V, et al. *Circulation*. 2000;102:III5-9.
2. Morocutti G, et al. *Cardiovasc Surg*. 2002;10:328-32.

Table: Demographic Data

Variable	Mean	Std Dev
Age (yrs)	63.4	14.1
Male/Female	171/120	
Height (cm)	169	15.2
Weight (kg)	84.2	20.2
EF (%)	49.5	14.2
Cross clamp time (min)	117.7	51.3
CPB time (min)	179.7	72.0
Length of stay (days)	9.3	9.5
Prosthetic valve size (mm)	22.4	2.4
Number of grafts	2.1	1.0

