

SCA 29

VARIABILITY OF INTRAOPERATIVE FUNCTIONAL MITRAL REGURGITATION SEVERITY IN PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTING

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Introduction: Mitral regurgitation(MR) severity is reportedly responsive to perioperative changes in afterload.^{1,2} Intraoperative transesophageal echocardiographic(TEE) assessment of MR severity, especially for ischemic or functional MR, may influence the decision to perform a mitral valve(MV) procedure during concurrent cardiac surgery.³ This study investigated the incidence of change in MR severity during the entire pre-cardiopulmonary bypass(CPB) period.

Methods: TEE evaluation was performed in 20 patients undergoing coronary artery bypass grafting(CABG). All patients had MR without significant structural MV abnormalities. Following induction and prior to CPB, the MR color flow Doppler jet(CDJ) in the mid-esophageal 4-chamber view was continuously recorded until the initiation of CPB. Mean arterial pressure(MAP) was recorded at 5-minute intervals. Three experienced echocardiographers blinded to MAP, graded MR severity off line according to the CFDJ area. The MR severity within each 5-minute interval and corresponding MAP were determined. Analysis was performed using JMP version 4.0(SAS Institute, Cary, NC). Data are reported as meanstandard error.

Results: A total of 342 time intervals(individual range 11-25) were analyzed from the 20 patients. Throughout the study period, the frequency of observed MR grades(0,1+,2+,3+,4+) were 14%, 58%, 20%, 6%, and 1%, respectively. MAP averaged 7516 mmHg. MR severity changed by one grade at least once in 18/20(90%) patients, and changed between 24% of all time intervals. Changes in MAP for any given 5-minute interval was predictive of a change in MR grade($P<0.05$). A change in MR grade was associated with an increase or decrease in MAP of 72 mmHg(Fig. 1). However, for any individual patient, the average MAP at the times when the patient had their highest MR grade was an average of only 4 mmHg greater than when the patient had their lowest MR grade. Although 57% of observed variability in MR grade was accounted for by patient and MAP factors, less than 18% of the variability was accounted for by MAP alone.

Discussion: This study reports the considerable variability of intraoperative MR severity during the pre-CPB period. Changes in MR severity were significantly associated with a concomitant change in MAP, yet considerable change in MAP can occur without change in MR severity(Fig. 2). Understanding the dynamic nature of MR is critical for the intraoperative TEE evaluation of its severity and decision for possible MV repair or replacement.

1. J Cardiothorac Vasc Anesth 1994;8:19-23
2. Am J Cardiol 2000;85:199-203
3. Circulation 2001;104:168-75

Figure 1. Percentage of 5-minute time intervals with a change in mitral regurgitation (MR) grade, and the mean arterial pressure (MAP) change associated with MR grade change

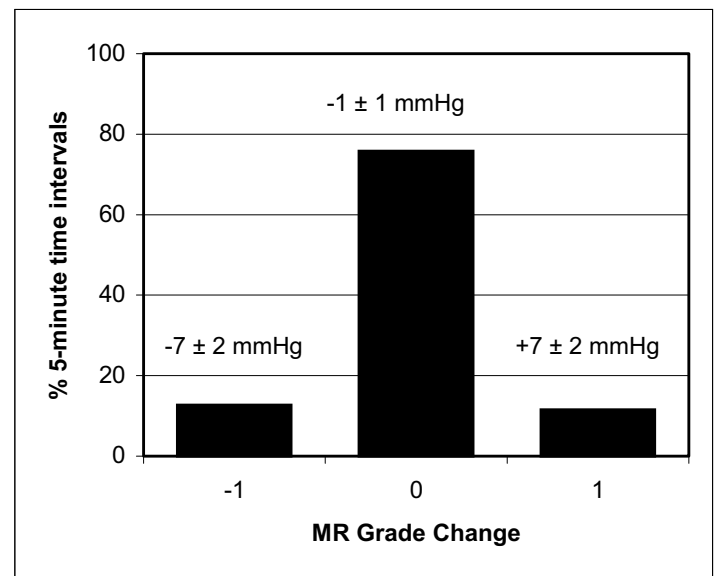


Figure 2. Logistic fit of probability of mitral regurgitation (MR) grade change by change in mean arterial pressure (MAP) compared to previous 5-minute time interval.

