

Predictors of Pericardial Effusion Requiring Drainage Following Coronary Artery Bypass Graft Surgery: A Retrospective Analysis

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Abstract : Objective: Pericardial effusions are an uncommon but potentially fatal complication after cardiac surgery. The goal of this study was to describe the incidence and risk factors associated with the development of pericardial effusion requiring drainage after coronary artery bypass graft surgery (CABG). Methods: A retrospective analysis was undertaken using prospectively collected data. All adult patients who underwent CABG at our institution between 1st January 2017 and 31st December 2018 were included. Pericardial effusion was diagnosed using transthoracic echocardiography (TTE) performed for clinical suspicion of pre-tamponade or tamponade. Drainage was undertaken if considered clinically necessary and performed via a sub-xiphoid incision, pericardiocentesis, or via re-sternotomy at the discretion of the treating surgeon. Patient demographics, operative characteristics, anticoagulant exposure, and postoperative outcomes were examined to identify those variables associated with the development of pericardial effusion requiring drainage. Tests of association were performed using the Fischer exact test for dichotomous variables and the Student t-test for continuous variables. Logistic regression models were used to determine univariate predictors of pericardial effusion requiring drainage. Results: Between January 1st, 2017, and December 31st, 2018, a total of 408 patients underwent CABG at our institution, and eight (1.9%) required drainage of pericardial effusion. There was no difference in age, gender, or the proportion of patients on preoperative therapeutic heparin between the study and control groups. Univariate analysis identified preoperative atrial arrhythmia (37.5% vs 8.8%, $p = 0.03$), reduced left ventricular ejection fraction (47% vs 56%, $p = 0.04$), longer cardiopulmonary bypass (130 vs 84 min, $p < 0.01$) and cross-clamp (107 vs 62 min, $p < 0.01$) times, higher drain output in the first four postoperative hours (420 vs 213 mL, $p < 0.01$), postoperative atrial fibrillation (100% vs 32%, $p < 0.01$), and pleural effusion requiring drainage (87.5% vs 12.5%, $p < 0.01$) to be associated with development of pericardial effusion requiring drainage. Conclusion: In this study, the incidence of pericardial effusion requiring drainage was 1.9%. Several factors, mainly related to preoperative or postoperative arrhythmia, length of surgery, and pleural effusion requiring drainage, were identified to be associated with developing clinically significant pericardial effusions. High clinical suspicion and low threshold for transthoracic echo are pertinent to ensure this potentially lethal condition is not missed.

Keywords : coronary artery bypass, pericardial effusion, pericardiocentesis, tamponade, sub-xiphoid drainage

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