Coronary Artery Disease and Coronary Artery Bypass Grafting at the Time of Lung Transplantation Do Not Impact Overall Survival

Kieran Halloran, 1,2 Alim Hirji, 1,2 David Li, 1 Kathy Jackson, 1 Ali Kapasi, 1,2 Steve Meyer, 1,3 John Mullen, 1,3 Dale Lien, 1,2 and Justin Weinkauf 1,2

Background. Coronary artery disease (CAD) is common in lung transplant candidates and may require revascularization before or at the time of their transplant. We reviewed the survival of lung transplant recipients with CAD requiring surgical intervention (CAD-coronary artery bypass grafting [CABG]) and those who did not (CAD-NoCABG) at the time of transplant, compared to a cohort with no CAD (NoCAD). Methods. We conducted a retrospective cohort study of adult patients transplanted in our program between 2004 and 2013. Our primary outcome was the association between 3-way CAD status (CAD-CABG, CAD-NoCABG, NoCAD) and overall retransplant-free survival via proportional hazards modeling, adjusting for age, gender, and transplant indication. Secondary endpoints included 1-year survival, survival by Kaplan-Meier analysis, duration of ventilation, intensive care unit stay, and hospitalization. Results. A total of 333 patients underwent transplant during the study timeframe. A total of 24 (7%) had CAD requiring CABG, 82 (25%) had CAD not requiring CABG, and the remaining 227 had no CAD. The 3-way CAD status was not associated with overall retransplant-free survival after adjustment for age, gender, and transplant indication. Duration of mechanical ventilation, intensive care unit stay and hospitalization were longer in both CAD groups compared with the NoCAD group. Conclusions. CAD status does not impact overall retransplant-free survival, despite greater perioperative complexity. Prospective studies comparing treatment strategies in these patient groups are warranted.

(Transplantation 2019:000: 00-00)

INTRODUCTION
Coronary artery disease (CAD) is a common comorbidity in patients with end-stage lung disease and a relative contraindication to lung transplantation. 1,2 This is due to the substantial contribution of cardiovascular events to mortality in lung transplant recipients, potentially reflecting an accelerated atherosclerotic process previously documented in transplant recipients. 3,4 This acceleration is at least in part driven by endothelial dysfunction and metabolic derangements caused by immune suppressive drugs, most notably the calcineurin inhibitors and corticosteroids. 5,6 Despite these concerns, patients undergoing lung transplant with mild-to-moderate CAD have been reported to have similar outcomes to those without. 7 For patients with more severe CAD documented prior to transplant, the revascularization options—percutaneous coronary intervention (PCI) and coronary artery bypass grafting (CABG)—have respective advantages and disadvantages. PCI can be done pretransplant in a minimally invasive fashion and results in less operative complexity, but is felt to be less beneficial for diffuse disease (3 or more vessels requiring therapy) or disease of the left main coronary artery. 8 Modern drug-eluting stents also require antplatelet therapy that often delays listing for transplant. 9 CABG has advantages in terms of definitive revascularization with no associated listing delay due to antplatelet therapy, but increases the complexity of the transplant operation. Previous studies have demonstrated that acceptable short- and long-term outcomes are possible with both strategies. 10,11

Our center has historically pursued a strategy of standardized surgical revascularization when lesions requiring therapy are documented during the transplant workup.