

Article Title:

Seal The Bleed or Wait to Proceed? Resuscitation and Early vs. Delayed Timing for Thoracic Endovascular Aortic Repair in Blunt Thoracic Aortic Injury

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Abstract:

Introduction: In patients with blunt thoracic aortic injury (BTAI) undergoing thoracic endovascular aortic repair (TEVAR), the optimal timing of intervention remains unclear, particularly in the context of concurrent injuries and resuscitation needs. This study compares early versus delayed TEVAR and identifies predictors of mortality. We hypothesize that TEVAR timing is not independently associated with mortality after adjusting for clinical covariates, including resuscitation markers.

Methods: A single-center, retrospective review of patients with BTAI and TEVAR was performed. Resuscitation markers [lactate, base excess (BE)], transfusions, and outcomes were collected. Patients were stratified by TEVAR timing. A multivariable logistic regression (MLR) was performed for mortality.

Results: 93 patients underwent TEVAR and met inclusion criteria. There were 23 (25%) patients in the delayed and 70 (75%) in the early cohorts. There was no difference in demographics, initial vital signs, or concomitant TBI or SOI between cohorts. The delayed group had more immediate operative intervention for associated injury (52% vs. 21%, $p=0.01$) and were more likely to be resuscitated to a lactate of 2 or BE -2 before intervention (95% vs. 60%, $p=0.002$). The grade of injury was significantly different ($p=0.01$) between delayed and early groups: I (1% vs. 0%), II (43% vs 13%), III (56% vs 71%), and IV (0% vs. 14%). Death was most commonly from the sequela of traumatic thoracic aortic coarctation ($n=3$, 33%) and multisystem organ failure ($n=3$, 33%). MLR found that PRBC transfusion within the first 24 hours (AOR 1.18, 95%CI 1.06-1.30, $p=0.02$) was associated with mortality after adjusting for covariates, including time to TEVAR and grade of injury.

Conclusions: The timing of TEVAR was not related to outcomes. Early PRBC transfusion predicts mortality. Timing of TEVAR should depend on the patient's condition rather than a fixed time point.