Objective(s): Blunt thoracic aortic injury (BTAI) has a low incidence in patients with blunt thoracic trauma, however, it carries potentially devastating consequences. Controversy surrounding the timing of repair for BTAI remains. We utilized a nationwide database to determine the association between the timing of BTAI repair and outcomes using matched controls.

Methods: Retrospective review of the National Trauma Databank from 2008 to 2015. All patients with BTAI, based on Abbreviated Injury Scale (AIS) codes 420099, 420299 and 420202-18, were included. Based on the University of Washington revised classification scheme, aortic injuries were grouped into minimal (small intimal tear), moderate (large intimal tear or pseudo aneurysm) and severe (rupture). Repair time was classified as early (before 24 hours) or delayed (after 24 hours). Our primary outcome measure was in-hospital mortality while our secondary outcome measures were post-operative complications and length-of-stay (LOS).

Results: A total number of 4031 patients met inclusion criteria. A total of 3349 patients (83%) underwent early repair while 682 patients (17%) were treated in a delayed fashion. On multivariate analysis, early repair was associated with significantly increased in-hospital mortality regardless of BTAI grade (odds ratio (OR): 2.94, 2.23 and 2.88; 95% Confidence Interval (CI): 1.55-5.69, 1.23-4.04 and 1.74-4.77; P values 0.001, 0.008 and <0.001; for minimal, moderate and severe injuries, respectively). In surviving patients, significantly fewer complications were observed with early repair, again regardless of injury grade (OR: 0.64, 0.67 and 0.46; 95% CI: 0.47-0.87, 0.48-0.94 and 0.34-0.62; P values 0.004, 0.02 and <0.001; for minimal, moderate and severe injuries, respectively). In addition, and again regardless of injury grade, early repair was also associated with a shorter LOS (Hazard Ratio (HR): 0.64, 0.81 and 0.81; 95% CIs: 0.55-0.74, 0.68-0.96 and 0.70-0.94; P values <0.001, 0.01 and 0.006; for minimal, moderate and severe injuries, respectively).

Conclusions: Regardless of injury severity, early (<24 hours) repair for BTAI is associated with increased mortality, yet less post-operative complications and a shorter hospital length of stay.