



CWIS Chest Wall Injury Summit 2023

Oral Presentation Abstract Submission

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Title of Presentation Early vs. Late Surgical Stabilization of Multiple Rib Fractures in Patients with Traumatic Brain Injury: A Nationwide Analysis

Background

Surgical stabilization of rib fractures (SSRF) has emerged as a viable option for the management of patients with severe chest wall injuries. While early SSRF was associated with improved in-hospital outcomes in patients with isolated chest trauma, there is still a paucity of data examining the optimal timing of SSRF in patients with concomitant traumatic brain injury (TBI). This study aimed to assess whether early SSRF was associated with improved outcomes in patients with multiple rib fractures and TBI.

Methods

We performed a retrospective analysis of ACS-TQIP 2016-2020, including patients with TBI and multiple rib fractures who had undergone SSRF. The primary outcome was in-hospital mortality. Secondary outcomes included hospital length of stay (H-LOS), post-procedural LOS, ventilator-associated pneumonia (VAP), intensive care unit length of stay (ICU-LOS), ventilator days, and tracheostomy rate. Propensity score matching accounting for patient characteristics and injury burden (Figure 1) was performed to compare patients who underwent early rib fixation (≤ 72 hours) vs. late (>72 hours).

Results

Of 712 patients included in this analysis, 291 (40.9%) and 421 (59.1%) underwent early vs. late SSRF, respectively. After propensity score matching, 190 well-balanced pairs were formed. No significant difference in mortality was observed between the early and late SSRF groups (6.3% vs. 3.7%, $p=0.24$). However, compared with delayed SSRF, early rib fixation was associated with significantly shorter H-LOS (12.8 days vs. 20.6 days, $p<0.001$), a lower rate of VAP (4.7% vs. 12.6%, $p=0.006$), shorter ventilator days (5 days vs. 8 days, $p<0.001$), and a shorter ICU-LOS (8 days vs. 14 days, $p<0.001$) (Figure 2).

Conclusion

While no difference in mortality was seen when comparing early vs. late SSRF in TBI patients, early SSRF was associated with a significant decrease in H-LOS, ICU-LOS, ventilator days, and VAP rate. These findings suggest a beneficial role of early rib fixation in patients with TBI.