



CWIS Chest Wall Injury Summit 2023

Oral Presentation Abstract Submission

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Title of Presentation Surgical Stabilization of rib fractures in anticoagulated patients: proceed with caution?

Background

Anticoagulant use may be associated with increased morbidity following chest wall trauma. Although surgical stabilization of rib fractures (SSRF) is increasingly performed, the outcome of patients undergoing SSRF while on anticoagulation therapy pre-injury remains unknown. This study aimed to compare surgical process and outcomes of patients who did and did not use anticoagulation therapy prior to injury. We hypothesize that pre-injury anticoagulant use is associated with delay in SSRF and worse clinical outcomes.

Methods

We queried the Chest Injury International Database (CIID), established by the Chest Wall Injury Society (CWIS), for patients undergoing SSRF between August 2018 and March 2022 stratified by preinjury anticoagulation. Anticoagulation therapy was categorized into antiplatelet use (e.g. ASA and clopidogrel) and anticoagulant use (e.g. coumarins and factor Xa inhibitors). The primary outcome was time from injury to SSRF (>2 days vs ≤2days). Secondary outcome measures included SSRF duration, 90-day readmission rate, and complications such as bleeding and development of pneumonia. Univariate analysis was performed using Chi-squared or Wilcoxon-rank-sum tests as appropriate. Generalized linear models accounted for clustering within facilities and for confounders. Numerical data are presented as median (IQR).

Results

Two hundred and eighteen SSRF patients were included, of whom 25 (11.4%) were on anticoagulation therapy pre-injury. These patients were significantly older (72 years, IQR: 65–80 versus 57 years, IQR: 43–66; $p < 0.0001$), had more comorbidities (2, IQR: 1–3 versus 0, IQR: 0–1; $p < 0.0001$), and had a lower ISS (14, IQR: 10–20 versus 21, IQR: 14–30; $p = 0.0021$). Rib Score did not differ significantly (3, IQR: 1–3 versus 3, IQR: 2–4; $p = 0.12$), as did time from injury to SSRF (2 days, IQR: 1–4 versus 3 days, IQR: 2–5; $p = 0.31$) and operative time (154 mins, IQR: 120.0–212.0 versus 177 min, IQR: 143.0–210.0; $p = 0.34$). Patients using anticoagulants were more likely to have complications (8, 32% versus 26, 13.5%; $p = 0.02$) and required longer ICU stay with fewer ICU-free days (24, IQR: 22–26 versus 28, IQR: 23–28; $p = 0.004$). However, they had shorter ventilation time, with more ventilator free days (VFD) (28, IQR: 28–28 versus 27, IQR: 27–28; $p = 0.008$). After adjusting for confounders and intra-facility clustering, pre-injury anticoagulation was not significantly associated with delayed SSRF (i.e. >2 days after admission) (Relative Risk, RR=0.99, 95% CI 0.70–1.41), readmission within 90 days (RR=0.59, 95% CI 0.05–6.93), operative time (RR=1.07, 95% CI 0.96–1.20) or occurrence of complications (RR=0.98, 95% CI 0.27–3.49).

Conclusion

Pre-injury anticoagulant use neither delayed SSRF nor impacted operative time in patients requiring SSRF. Additionally, it was not associated with increased risk of complications. We therefore conclude that SSRF can be safely performed without delay in patients who are on anticoagulation therapy at the time of injury.