

Chest Wall Injury Society

Title of Presentation

Timing of Regional Anesthesia in Isolated Flail Chest

Background

Flail chest causes severe pain and respiratory failure. The optimal timing for administering regional anesthesia (RA) in patients with flail chest remains unclear. This study aims to determine whether earlier RA (≤ 24 hours) in isolated flail chest impacts overall outcomes.

Methods

We conducted a retrospective cohort study using data from the ACS TQIP (2017 -2023). Adults (≥ 18 years) with isolated flail chest receiving RA (epidural or peripheral nerve block) were included. We excluded patients with penetrating trauma, extra-thoracic AIS ≥ 3 , death or discharged within 24 hours, transfers, and ED intubation. The cases were divided into early RA (≤ 24 hours) and late RA (> 24 hours). The outcomes included unplanned intubation, routine discharge, hospital length of stay (LOS), and ICU LOS. Multivariable logistic and linear regression adjusted for patient characteristics, thoracic AIS, mechanism of injury, rib fixation, and shock index. A sub-analysis evaluated the rib-fixation cohort.

Results

There were 5,409 isolated flail chest cases with a median age of 59 years. 71% were male, and most cases involved a motor vehicle collision (66%). 79% of patients received early RA, and analysis showed that late RA was associated with increased odds of unplanned ICU admission (OR 1.49, 1.15-1.92, $p=0.001$), unplanned intubation (OR 1.50, 95% CI 1.17-1.93, $p=0.001$), prolonged hospital and ICU stays ($p<0.001$) and decreased likelihood of routine discharge (OR 0.76, 0.65-0.87, $p<0.001$). Sub-analysis showed that early administration of RA was associated with lower tracheostomy rates and shorter ICU and hospital stays ($p<0.05$).

Conclusion

In isolated flail chest, RA beyond 24 hours is associated with unplanned ICU admission, intubation, prolonged hospital and ICU durations, and lower rates of routine discharge. These findings support prioritizing early analgesic intervention to improve recovery and reduce morbidity.

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