# Rib Fractures with Concomitant Spinal Fractures Benefit from Surgical Stabilization

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## BACKGROUND

Surgical stabilization of rib fractures has previously demonstrated benefits in patients with complex thoracic cage injuries. However, it remains a challenge to identify which patients will benefit from surgical fixation with concomitant spine injuries.

## OBJECTIVES

Identify benefits of surgical fixation in patients suffering rib fractures and concomitant spinal fractures. **Primary Outcomes**: Mortality, ventilator days, and length of hospital/ICU stay.

## METHODS

All adult patients with rib injuries from years 2015-2019 were pooled from the National Trauma Data Bank. All categorical variables were tested with chi-squared tests.

## RESULTS

178,818 patients with rib and spinal fracture (RFWSF) met inclusion criteria. 11,989 (6.7%) had flail chest and spinal fractures, 31,726 (17.7%) had single RFWSF, and 135,103 (75.5%) had multiple RFWSF. Multiple Rib fractures carried an increased risk of spinal fracture (55%) vs Flail Chest (42.8%) vs Single rib fracture (2.2%). Mortality with FIX RFWSF decreased by (6.1%) versus NFIX group. Mortality of FIX of rib fractures without spinal fractures (RFWO) decreased by (2.2%) vs the NFIX group. Ventilator free days for RFWSF FIX v. NFIX group were 9 vs 5 ($p<0.001$) vs RFWO FIX vs NFIX group were 6 vs 3 ($p<0.001$). Overall hospital length of stay (LOS) and ICU LOS were decreased in FIX groups.

## CONCLUSION

Patients with RFWSF are more likely to receive rib FIX than those with RFWO. Rib FIX in patients with RFWSF versus those with RFWO facilitates less ventilators days, shorter ICU and hospital LOS as well as decreases mortality.

| N=178,818 | Rib Fractures with Spinal Fractures with Fixation | Rib Fractures without spinal Fractures with Fixation |
|---|---|---|
| Mortality decrease with fixation | 6.1% | 2.2% |
| Ventilator days | Decreased by 4 days with fixation | Decreased 3 days with fixation |
| Length of hospital and ICU stay | Decreased with fixation | Decreased with fixation |