Are first rib fractures a marker for life-threatening injuries in patients with major trauma?

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Why this study makes sense

• Previous small single-centre studies have shown an association between first rib fractures and other severe or life-threatening injuries.

• These studies were generally small retrospective studies, open to selection bias.

• In addition, they did not compare patients having first rib fractures with any other control group.

• All previous studies used CXR as the sole technique for detection of fractures

• With the increased use of CT as a primary imaging technique in major trauma, it is likely that a higher number of first rib fractures are being diagnosed as incidental findings.
Cohort study

- Recruited cohort: Patients sustaining rib fractures between January 2012 and December 2013 using data from the UK Trauma Audit and Research Network (>15 years old).

- 1683 patients with first rib fractures and 8369 with fractures of other ribs were identified.
Outcome

- Patients with first rib fractures were more likely to sustain serious intrathoracic and extra-thoracic injuries when compared with patients with other rib fractures.

- First rib fractures were associated with increased injury severity and polytrauma.

- Crude mortality rates were higher.
• The proportion of patients with multiple rib fractures (involving ≥3 consecutive ribs) was the same in both groups (44.3% vs 44.2%).

• Difference in significant intrathoracic injuries. (table 2):
  Flail chest (26.7% vs 16.8%),
  Severe lung injuries (44.1% vs 22.1%),
  Heart/pericardial injuries (1.6% vs 0.5%)
  Intrathoracic vascular injuries (2.3% vs 0.8%).
• Difference in **significant extrathoracic injuries**: Serious traumatic brain injuries (28.9% vs 12.5%), Cervical spine injuries (6.6% vs 1.5%), Thoracic spine injuries (6.7% vs 2.9%), Liver injuries (4.0% vs 1.7%) and Pelvic ring fractures (8.7% vs 4.2%)

• No difference between both groups: splenic injuries.
Quality

- **Selection bias**: Recruited cohort: selected according to TARN inclusion criterias. ([tarn.ac.uk](http://tarn.ac.uk)).

- **Measurement bias**: All patients have each of their individual injuries reliably and reproducibly coded from imaging, operative and autopsy reports at the TARN coordination centre at Salford Royal Hospital. The Abbreviated Injury Score (AIS) is used to allocate a numerical severity code to each injury as well as a localiser code which enables precise identification of each rib fracture. The AIS coding system then allows an overall Injury Severity Score (ISS) to be calculated for each patient.
Conclusion

- Good quality study

- First rib fractures are a marker of life-threatening injuries in major trauma.

- The increased mortality associated with these injuries was seen only in patients with polytrauma, suggesting that first rib fractures are an indicator of life-threatening intrathoracic and extrathoracic injury.

- Management of patients with first rib fractures should focus on identification and treatment of associated life-threatening injuries
WILL HE KILL ME IF I TELL HIM OR WILL HE KILL ME IF I DON’T TELL HIM?

by A. Bogus
"Your x-ray showed a broken rib, but we fixed it with Photoshop."