
Rib Fracture Diagnosis in the Panscan Era



With increased use of chest computed tomography (CT) in trauma valuation, traditional teachings in regard to rib fracture morbidity and mortality may no longer be accurate. New research shows that, under current chest CT imaging protocols, two thirds of rib fractures were observed on chest CT only; also, patients with rib fractures had higher admission rates and mortality than those without rib fractures.

Additionally, first or second rib fractures were associated with significantly higher mortality and great vessel injury, according to the findings to be published in *Annals of Emergency Medicine*, the official journal of the American College of Emergency Physicians.

Trauma centres are increasingly incorporating head-to-pelvis CT (panscan) in their imaging protocols for blunt trauma, and chest CT use has increased markedly. With the much greater sensitivity for minor pulmonary and thoracic injury afforded by chest CT, rib fractures are likely being diagnosed with greater frequency, possibly rendering standard principles about rib fractures obsolete. In this study, investigators sought to determine the frequency of rib fracture observed on CT only versus fractures observed on both chest CT and chest radiograph; admission rates and mortality of groups of patients: those with rib fracture observed on CT only, those with isolated rib fracture, and those with fractures of the first or second rib; and the frequency of first or second rib fracture associated great vessel injury.

Researchers conducted a planned secondary analysis of two prospectively enrolled cohorts of the National Emergency X-Radiography Utilisation Study chest studies, which evaluated patients with blunt trauma who were older than 14 years and received chest imaging in the emergency department. They defined rib fractures and other thoracic injuries according to CT reports and followed patients through their hospital course to determine outcomes.

Of 8,661 patients who had both chest radiograph and chest CT, 2,071 (23.9%) had rib fractures, and rib fractures were observed on chest CT only in 1,368 cases (66.1%). In addition to the findings described above, investigators observed that patients with first or second rib fractures had significantly higher prevalence of concomitant great vessel injury than patients with fractures of ribs 3 to 12, and the odds ratio of great vessel injury with first or second rib fracture was 4.4 (95% CI 1.8 to 10.4).

"Our findings confirm previous teaching in regard to first or second rib fracture-associated great vessel injury and mortality," the authors write. "We found no difference between mortality rates or rates of great vessel injury in patients with first or second rib fractures observed on chest radiograph compared with those observed on CT only."

The study has important limitations, among them is that the authors limited their review of clinical outcomes to mortality and great vessel injury. "The high admission rates may merely reflect the detection of injuries and not be a true morbidity outcome. Future evaluation of other outcomes, such as need for pain control by nerve blocks and epidural catheters, may reveal important data to consider when rib fracture diagnosis protocols are implemented," the authors point out.

Source: [Annals of Emergency Medicine](#)

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