

Tractor Rollover Injury – A Life Threatening Blunt Chest Injury

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Abstract— Complex chest injuries are very common due to roll over vehicle accidents. Such Injuries could be life threatening if not managed early as they lead to tension pneumothorax, mediastinal injuries and intrathoracic hemorrhage. There are varying modalities available for treating such injuries and many times, operative intervention is required for such injuries. Conservative management of such injuries have resulted in prolonged Intensive Care Unit (ICU) stay, prolonged hospital stays, variety of lung complications and infections, delayed healing of rib fractures. Also there is persistent requirement for analgesic medications for long term and poor quality of life until about six months. Managing such patients with operative means gives a more aggressive and promising option for patients and reduces the consequences of such injury which is proved to be more effective and preferred method nowadays. Here is a similar case of complex chest injury which was managed operatively and had proved to be more fruitful than conservative management.

Keywords— Rollover injury , rib fixation , lung laceration , pneumothorax.

I. CASE REPORT

A 69 year old male patient came with history of rollover of tractor while working in farm. Patient presented with severe chest pain on both sides and severe breathlessness. Patient was conscious, tachycardiac (heart rate- 124/min), tachypneic (respiratory rate- 40/min) and hypoxic on arrival. Patient was started oxygen therapy with 6 litres of oxygen by non-rebreathing mask and examination revealed decreased bilateral air entry with bony crepitations & surgical emphysema on left side. Chest x-ray revealed bilateral pneumothorax with left multiple rib fractures. Intercostal drainage tube (ICD) was inserted first on left side and no air leak was confirmed.

side with ICD insitu on left side, extensive surgical emphysema on chest wall which was more on left side and midline, few areas of cavitation in left lung parenchyma suggesting lung laceration with multiple patchy areas of ground glass opacities and air space opacification suggesting of lung contusion and significant mediastinal emphysema. Bone window showed fracture of left 1st to 12th ribs (figure 2), right 1st to 5th ribs and body of left scapula. Right intercostal tube drainage was inserted after CT scan without evident air leak post ICD.

Routine blood investigations were done which were found normal. Patient was managed with Intravenous (IV) antibiotics, multimodal IV analgesics and shifted to Intensive Care Unit (ICU) for monitoring and further management.



Figure 1. Bilateral Pneumothorax with Left sided Subcutaneous Emphysema

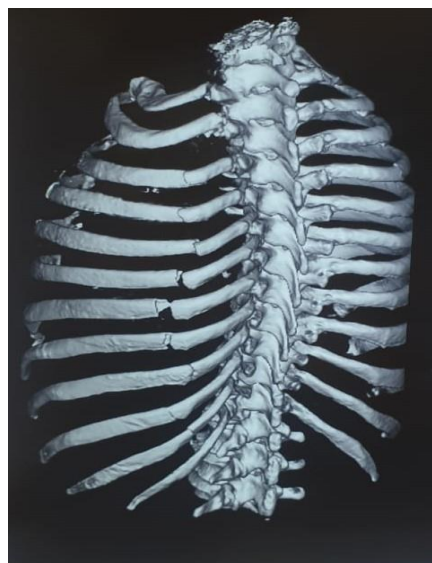


Figure 2. Right sided 1st to 12th rib fractures

Post stabilization CT chest was done which showed bilateral pneumothorax (figure 1) which was larger on right

Patient improved after ICD insertion on either side with less breathing difficulty, persistent oxygen requirement

& persistent increased pain score (8/10). He was undertaken for thoracotomy and left rib fixation. Left posterior thoracotomy with fixation of 4th, 5th and 6th ribs were done with 8 hole plate and 6 cancellous screw in each plate (figure 3 and 4).

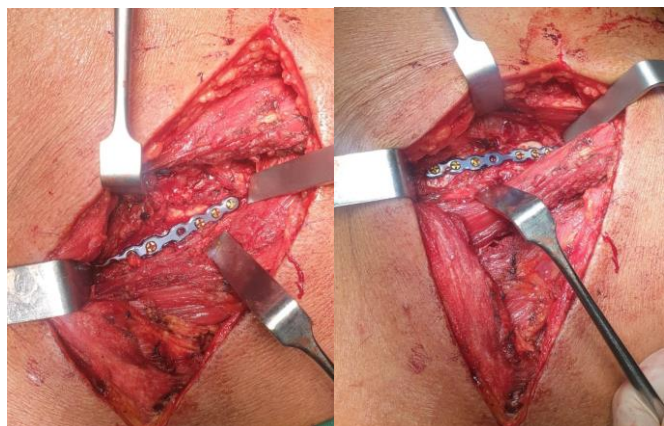


Figure 3 and 4. Left posterior thoracotomy with fixation of 4th, 5th and 6th ribs were done with 8 hole plate and 6 cancellous screw in each plate.

Post operative period was uneventful with good pain management (pain score 3/15). Patient was discharged with left ICD in situ on third postop day and it was removed in follow up after 5 days. Patient improved drastically and could return to normal routine work within 4 weeks of discharge.

II. DISCUSSION

Few prospective studies have been done on surgical rib fixation which shows the significance of it. While most studies are retrospective, a meta-analysis and systemic review of all such studies shows significant results of rib fixation with prospect to become a standardized management in multiple rib fractures.^[1]

Surgical rib fixation study done by *Leinecke et al* showed a 57% decrease in mortality, 55% lower risk of pneumonia and 75% lower risk of tracheostomy while *Slobogean* study showed 57% lower odds of mortality, 55% lower odds of pneumonia, 75 % lower odds of tracheostomy and 64% lower odds of septicemia. Both this studies also showed the decreased ventilator duration, decreased ICU stay and decreased hospital stay with surgery.^{[2][3]}

In a study done by *Uchida et al* showed offers good long-term benefits, with the ability of the patient with flail chest or multiple rib fractures to return to activity in the pre-morbid state. As short-term outcomes, the median number of days of mechanical ventilation and those of the ICU stay were 4 (1–8) and 6 (3–10) days, respectively.^[4]

Piercci's study revealed that surgical fixation performed within 72 hours improved the primary outcome of pain score at 2-week follow-up among patients with three or more displaced fractures in the absence of flail chest.^[5]

Another meta-analysis by *Liu et al* showed that the surgical management group experienced a significant decrease in hospitalization time, intensive care time, mechanical ventilation time, mortality rate, pulmonary infection rate and tracheotomy rate compared with the non-surgical management group.^[6]

In spite of significant advantages as in above stated studies favoring surgical rib fixation of multiple rib fractures over conservative management we lack consensus guidelines showing proper indications for selecting patients for rib fixation.

III. CONCLUSION

Such cases of complex blunt chest injuries involving multiple rib fractures, with or without flail segment requires early surgical stabilization of rib fractures. It has shown superior results and lesser complications when compared with conservative type of management.

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