

# Thoracic Epidural Used In The Emergency Department To Reduce Pain In A Patient With Multiple Rib Fractures: A Case Report

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## Abstract

Multiple rib fractures cause considerable pain that can seriously compromise respiratory mechanics and exacerbate underlying lung injury, predisposing to respiratory failure. Management of the patient with chest wall injury is directed allowing adequate oxygenation and ventilation. Multiple rib fractures due to blunt trauma to the chest wall as the result of assault, falls or motor vehicle accidents is a common presentation to the Emergency Department. Analgesia remains the mainstay of therapy for rib fractures. Opioid analgesics are useful but may cause respiratory depression if used in high doses. Continuous epidural infusion of local anaesthetic is a good option for treating patients with multiple rib fractures allowing improved inspiration and coughing without the risk of respiratory depression. We report such a case and discuss the subsequent clinical course and management.

## CASE REPORT

A 52-year-old male presented to the Emergency Department following a fall from 4 metre high scaffolding. His main complaint was severe right-sided chest pain, worse with movement and inspiration, and associated with shortness of breath. Past medical history included coeliac disease and hypothyroidism. He is a non-smoker and consumes alcohol occasionally.

Clinical examination revealed a flail chest segment on the right side with decreased air entry and dullness to percussion. The patient was maintaining his own airway and high flow oxygen was given. Oxygen saturation was 100% and other observations were normal. Intravenous access was obtained and intravenous morphine was given for pain control.

Chest X-ray was performed and revealed multiple lower rib fractures (7<sup>th</sup> -11<sup>th</sup>) on the right side with haemopneumothorax. A chest drain was inserted and a urinary catheter passed to monitor urine output.

CT scan was performed; this was reported as

- Multiple fractures of right lower ribs postero-laterally causing flail chest segment. This is associated with right haemopneumothorax, right basal collapse and pulmonary contusion.

- Left lung is clear, no mediastinal haematoma or pericardial effusion.
- No significant spinal injury.

A total of 65mg of morphine had already been given with poor effect. The patient was therefore given 100mg ketamine intramuscularly. Despite these measures the patient was still in pain. We were reluctant to administer more opiate in view of the risk of respiratory depression may so we involved the anaesthetic department with a view to establishing a thoracic epidural. This was inserted at the T5 level in the Resuscitation Room, using an infusion of bupivacaine and fentanyl. Good pain control was achieved, with the patient making an uneventful recovery.

## DISCUSSION

Chest wall injury is common following blunt trauma, varies in severity from minor bruising to life threatening conditions. Management of pain is important as multiple rib fractures cause severe pain that can seriously compromise respiratory mechanics and exacerbate underlying lung injury and pre-existing respiratory disease, predisposing to respiratory failure.

Intravenous opiates remain the mainstay of pain control. If adequate pain control is not achieved, regional analgesic

techniques such as intercostals nerve block, epidural analgesia, intrathecal opioids, intrapleural analgesia and thoracic paravertebral block have been used effectively. Although invasive, regional blocks tend to be more effective than systemic opioids and produce less systemic effects when used for management of rib fracture.

Some studies concluded that thoracic epidural analgesia is superior to intravenous patient-controlled analgesia morphine in providing analgesia for treatment of rib fracture.<sup>1,2</sup> Patients who received epidural analgesia had significantly lower pain scores at all times.<sup>2</sup> When epidural analgesia is used appropriately in certain circumstances, it is associated with a decrease in the rate of nosocomial pneumonia and a shorter duration of mechanical ventilation after multiple rib fractures.<sup>3</sup>

One study described a mortality rate for patients with rib fractures as 10%; this increased for each additional rib fracture. In this study, epidural analgesia was used in 2.2% of patients with rib fractures and a reduction in mortality shown. Increasing number of rib fractures correlated directly with increasing pulmonary morbidity and mortality. Epidural analgesia was associated with a reduction in mortality for all patients sustaining rib fractures, particularly those with more

than 4 fractures but this modality of treatment appears to be underused.<sup>4</sup>

This case provided the opportunity to discuss the appropriateness of thoracic epidural analgesia usage within the Emergency Department for a patient with multiple rib fractures. This intervention can decrease the morbidity and mortality of patients with multiple rib fractures.

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