International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2024: 7.101

ICU Management of Bilateral Rib Fractures with Thoracic Epidural Analgesia: Optimizing Analgesia and Respiratory Outcomes ensuring Early Discharge and Patient Mobilisation

Dr. Malde Yash Cherish[1], Dr. Aarti Gharat[2], Dr. Jessy Vennel[3]

[1]Resident, Anaesthesiology, MGM Medical College and Hospital, Kamothe, Navi Mumbai- 410209, Maharashtra, India

[2]Associate Professor, Department of Anaesthesia, SICU In-charge, MGM Medical College and Hospital, Kamothe, Navi Mumbai- 410209, Maharashtra, India

[3]Professor & Head, Department of Anaesthesiology, MGM Medical College and Hospital, Kamothe, Navi Mumbai- 410209, Maharashtra, India

Abstract: ***Thoracic epidural analgesia was applied as part of conservative management in a non-intubated patient with multiple rib fractures following blunt chest trauma, accompanied by hemopneumothorax and associated injuries. To help with pain-related breathing problems, we used a steady flow of ropivacaine with fentanyl through the epidural, Objective outcomes were followed using numerical pain scores, incentive spirometry volumes, and oxygen saturation on room air. Pain intensity reduced rapidly within the first day of epidural initiation and remained well controlled during the intensive care stay. At the same time, there were noticeable increases in spirometry volumes, showing improved breathing effort and lung function, while oxygen levels in the air returned to normal as effective pain relief helped with deeper and steadier breathing. The clinical course was marked by early transfer from intensive care and discharge from hospital within a shorter duration than commonly reported for comparable rib fracture cases. No procedure-related complications or hemodynamic instability were noted. These findings highlight that thoracic epidural analgesia is an effective and important part of the overall care for patients with rib fractures who are treated without surgery, especially when it's crucial to prevent breathing problems.***

Keywords: thoracic epidural analgesia, rib fractures, chest trauma, pain management, respiratory function

1. Background

Bilateral/Unilateral rib fractures from chest trauma pose a significant risk for respiratory complications, primarily due to pain-induced hypoventilation. Conservative management is preferred in many cases, and thoracic epidural analgesia (TEA) provides effective pain control. This poster evaluates the impact of TEA on objective patient outcomes including spirometry performance, oxygen saturation on room air, and ICU/hospital length of stay in non-operated rib fracture patients.

2. Method

A middle-aged, non-intubated patient with history of fall from stairs from a height diagnosed with left sided rib fractures (Left 3rd–7th Rib) with left sided hemopneumothorax with ICD with Grade II liver laceration with left DER fracture was admitted to the ICU. Management was conservative and non-surgical from all specialties. A thoracic epidural catheter was placed at T6–7 level and a combination of ropivacaine with fentanyl administered by continuous infusion. Pain scores (NRS), incentive spirometry volumes, and oxygen saturation on room air as per O2 requirement were monitored daily. Early mobilization and chest physiotherapy were instituted.

3. Result

- Pain: NRS decreased from 8/10 to 2/10 within 24 hours of initiating TEA; significant reduction maintained throughout ICU stay.
- Spirometry: Volumes improved from ~750 mL pre-TEA to 1,500 mL by day 3, reflecting enhanced inspiratory capacity and lung mechanics.
- Oxygen Saturation: Room air SpO_2 improved to >96% by day 4, as pain control enabled deeper breathing and better alveolar ventilation.
- Discharge: Patient discharged from ICU on day 3 and from hospital on day 7 quicker than average LOS reported for severe rib fracture cohorts (3.5- 7.5 days ICU, 6- 15 days hospital)
- Safety: No major TEA- related complications of hemodynamic instability observed

4. Conclusion

Thoracic epidural analgesia was applied as part of conservative management in a non-intubated patient with multiple rib fractures following blunt chest trauma, accompanied by hemopneumothorax and associated injuries. To help with pain-related breathing problems, we used a steady flow of ropivacaine with fentanyl through the epidural. Objective outcomes were followed using numerical pain scores, incentive spirometry volumes, and oxygen saturation on room air. Pain intensity reduced rapidly within the first day of epidural initiation and remained well controlled during the intensive care stay.

At the same time, there were noticeable increases in spirometry volumes, showing improved breathing effort and lung function, while oxygen levels in the air returned to normal as effective pain relief helped with deeper and steadier breathing. The clinical course was marked by early transfer from intensive care and discharge from hospital within a shorter duration than commonly reported for comparable rib fracture cases. No procedure-related complications or hemodynamic instability were noted. These findings highlight that thoracic epidural analgesia is an effective and important part of the overall care for patients with rib fractures who are treated without surgery, especially when it is crucial to prevent breathing problems.

References

[1] Coblenz JJ, et al. *Thoracic Epidural as a Rescue Analgesic in a Patient with Multiple Rib Fractures.* **J Anesth Case Rep.** 2023; PMC10120608.
[2] Hashemzadeh S, et al. *Comparison Thoracic Epidural and Intercostal Block to Improve Pain and Pulmonary Function.* **J Cardiothorac Vasc Anesth.** 2011; PMC3825332.
[3] Beard L, et al. *Regional Analgesia & Pain Medicine.* **RAPM.** 2020; 45(5):351.
[4] Dalton MK, et al. *The expedited discharge of patients with multiple traumatic rib fractures.* **Injury.** 2019; S0020138318306090.