Significant Pulmonary Function Recovery Following an Intercostal Nerve Block in a Cough-Induced Rib Fracture

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Background

- Rib fractures affect approximately 45,000 people per year in the United States.
- The cost of rib fracture management is over $469 million per year to the healthcare system.
- Effective analgesia is vital in managing rib fractures to prevent secondary complications such as pneumonia, which significantly increase duration of stay during hospitalization.
- Multimodal management has become the gold standard of analgesic control in rib fractures.
- While systemic opioids are frequently utilized, they carry risk of adverse effects, including respiratory depression, tolerance, and physical dependence.
- Regional anesthetic techniques, such as the intercostal nerve block (ICNB), provide precise pain control within a multi-modal analgesic approach.
- We present a case of ICNB utilization in atraumatic rib fractures which facilitated opioid cessation and rapid pulmonary function improvement.

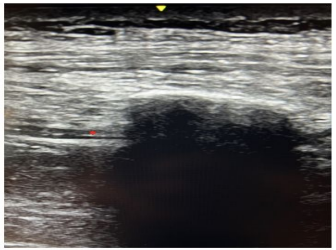


Figure 1: Ultrasound imaging of the Intercostal Rib Block with evidence of anesthetic spread.* denotes anesthetic spread.

Case Presentation

- A 32-year-old male with a history of asthma (BMI 47.7) presented with acute right-sided chest wall pain following several weeks of non-productive cough.
- The patient reportedly had a severe coughing episode, one day prior to presentation, and noted a “popping” sensation followed by immediate pleuritic chest pain.
- Computed Tomography imaging highlighted acute, mildly displaced fractures of the lateral right 6th and 8th ribs, accompanied by a small pleural effusion.
- Initial evaluation revealed severe pain, a strong cough and an incentive spirometry volume of 1750 mL.
- As such, the patient’s Pain, Inspiratory and Cough (PIC) score was a 6 (1 for severe pain, 2 for suboptimal inspiratory volume, and 3 for a cough); requiring close monitoring for respiratory decline and potential ICU transfer.
- Despite receiving a multimodal analgesic regimen consisting of topical agents, NSAIDs and opioids, the patient reported no analgesic relief.
- Given no relief and concern for respiratory decline, an intercostal nerve block was performed.
- The patient was able to achieve an incentive spirometry volume of 3000 mL and PIC score improved to 9 (3 for controlled pain, 3 for Inspiration at goal volume and 3 for strong cough).
- Within 24 hours, opioids were discontinued and the patient was discharged within 48 hours of admission on a non-opioid medication regimen.

Discussion

- This case highlights the viability of an ICNB as a vital component of pain control and pulmonary function recovery following chest wall injury.
- This targeted approach can provide significant and prolonged analgesia, allowing for the discontinuation of opioids, as well as decreased length of stay.
- Our case is notable for significant and acute pulmonary recovery following a single intervention without long term opioid requirements.

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