Prehospital Indications for Needle Decompression

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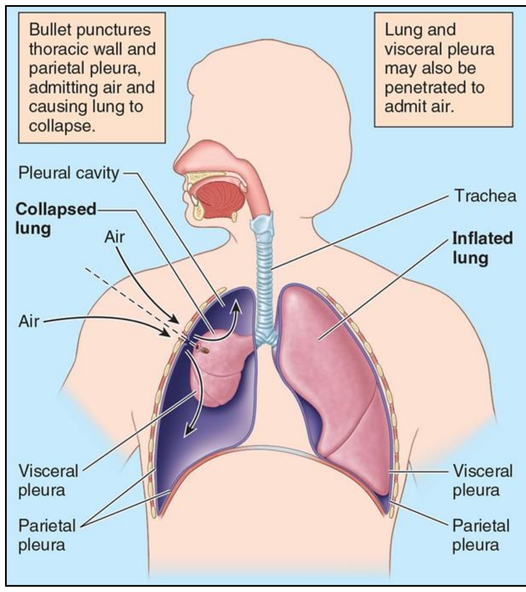
Introduction

- **Thoracic trauma can result in the development of a pneumothorax, which is defined as a collapsed lung**
- **Tension pneumothorax is a life-threatening condition caused by the build up of pressure around the lungs leading to obstructive shock**
- **Needle thoracostomies, which involves the insertion of a needle into the pleural cavity to release pressure, can be used to promptly relieve a tension pneumothorax.**
- **ROPE Proticols[2]**
  - **"A Simple Pneumothorax is accompanied with decreased or absent breath sounds and is not an indication for chest decompression."**
  - **A Tension Pneumothorax – "Medical Control consultation on Needle Decompression may be considered, but is not required, especially when the patient is in cardiac arrest with penetrating trauma."**
- **Objective of this study was to evaluate the use of needle thoracostomies in the trauma population by prehospital medical providers**

Methods

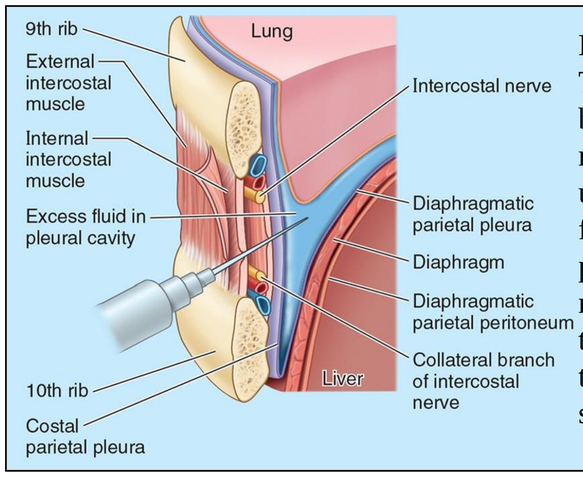
- **Retrospective chart review of adult trauma patients with prehospital needle thoracostomies presenting to an urban Level 1 Trauma Center over a four-year period**
- **Prehospital needle thoracostomy cases were reviewed by two independent expert panels of trauma surgeons and paramedics**
- **Unnecessary needle thoracotomies were defined as patients who did not have clinical signs of tension pneumothorax.**

Pulmonary Collapse[1]



The Lungs are held open due to surface tension from the pleural cavity. Loss of this surface tension within the pleural cavity from penetrating trauma can result in pulmonary collapse.

Thoracentesis[1]



Needle Thoracostomies may be preformed to release pressure build up that may be caused from tension pneumothorax. The needle is inserted into the pleural cavity through an intercostal space.

Panel Results

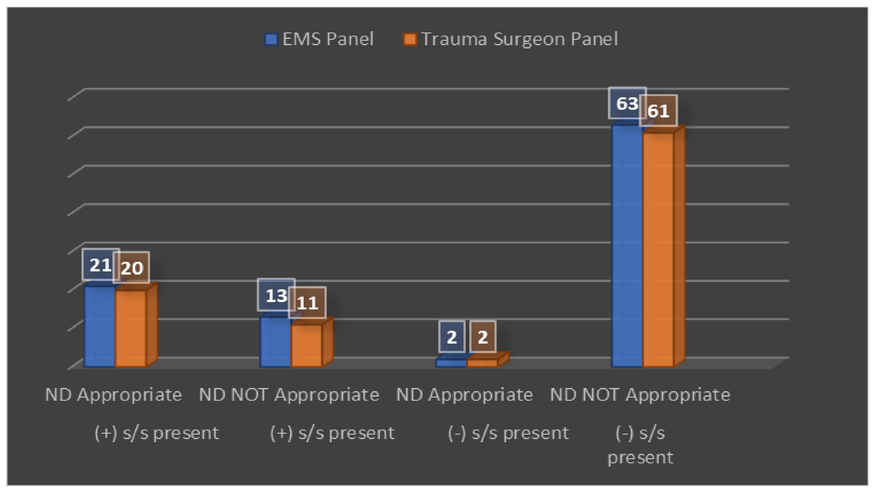


Chart Review Results

- **Of the 302 needle thoracostomies reviewed, 87 were identified as being potentially unnecessary.**
- **The average age of this population was 37.3 years old +/- 16.7 with 91% (n=79) being male gender.**
- **The average injury severity score was 20.5 +/- 14.3 and 56% of the patients had a penetrating trauma mechanism.**
- **The average on scene time was 9.4 +/- 5.9 min. The average transport time was 13.2 +/- 8.4 min. The mortality rate was 33% (n=20/87).**

Conclusion

- **Results suggested that potentially unnecessary needle decompressions are being performed in the prehospital setting**
- **The next step will be to refine existing guidelines for prehospital needle decompressions to avoid potentially unnecessary procedures for trauma patients**

References

1. **Dalley, A. F., R., A. A. M., Moore, K. L., & Moore, K. L. (2023). Moore's Clinically Oriented Anatomy (Ninth Edition). Wolters Kluwer.**
2. **Region One Metropolitan Ambulance Council Clinical Committee. (2021). Region One Protocol Effort.**

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