

## **INTRODUCTION**

Extensive open pneumothorax is a known life-threatening scenario which requires early thoracic surgical intervention. Damage control surgery who is performed by general surgeon in district hospital is life saving and produces good clinical outcomes.

## **CASE REPORT**

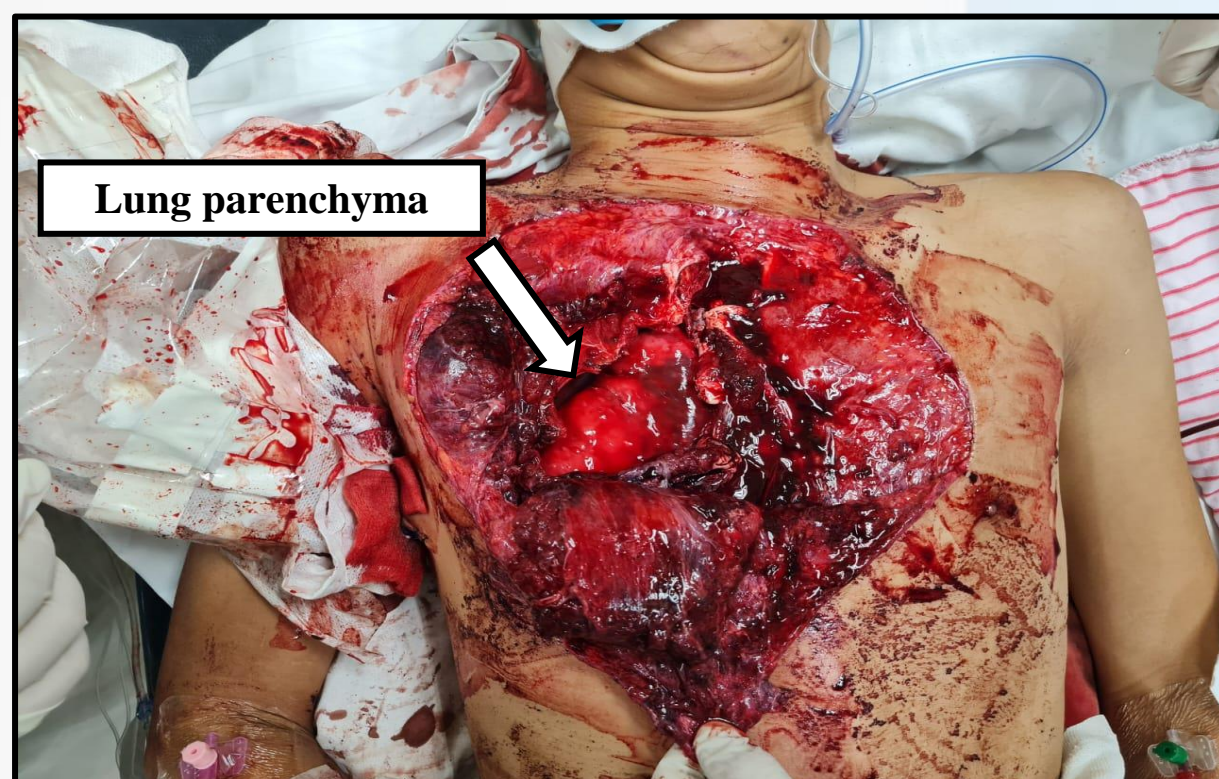
17-year-old-boy who was a motorcyclist alleged motor vehicle accident sustaining extensive open pneumothorax. Three-sided occlusive dressing was applied at the scene, and he was transferred to nearest district hospital. Upon arrival, he had tachycardia (heart rate 114), tachypnea (respiratory rate 26), with low oxygen saturation (SPO2 92%). Primary survey showed there was extensive right chest wall open pneumothorax wound measuring 20cm x 20cm with tissue losses exposing the collapsed right lung. He was immediately intubated with right chest tube inserted. Subsequent primary and secondary survey showed no other injuries. Computed Tomography (CT) Thorax revealed right anterior chest wall defect exposing right pleural cavity and right lung complicated with right lung laceration, right hydropneumothorax, pneumomediastinum and dislocation of right anterior first to fifth ribs. After consulting thoracic surgeon in tertiary center, patient was rushed to emergency operating theatre for damage control surgery. Emergency wound exploration and debridement had been performed, showing well expanded right lung without significant lung parenchyma air leak, active bleeding or contusion. Forth and fifth flail rib segments were excised, and sharp bone edges were trimmed. Modified pectoralis major muscle flap was performed to achieve proper right pleural cavity sealing and adequate skin wound closure. New chest tube inserted to drain pleural effusion. Surgery was successful without major intraoperative event, and he was transferred to intensive care unit (ICU) for post operative care. Early tracheostomy was performed on post-operative day 5 as anticipation of prolonged positive pressure ventilation. Unfortunately he developed superficial surgical site infection, which required wound exploration and abscess drainage on post operative day 10. He had been subsequently weaned off from mechanical ventilation, transferring out to surgical ward and underwent wound dressing, aggressive chest physiotherapy and rehabilitation. Following stormy recovery and secondary wound healing, his chest tubes were removed, tracheostomy was decannulated, and he was successfully discharged home on post-operative day 40.

## **DISCUSSION**

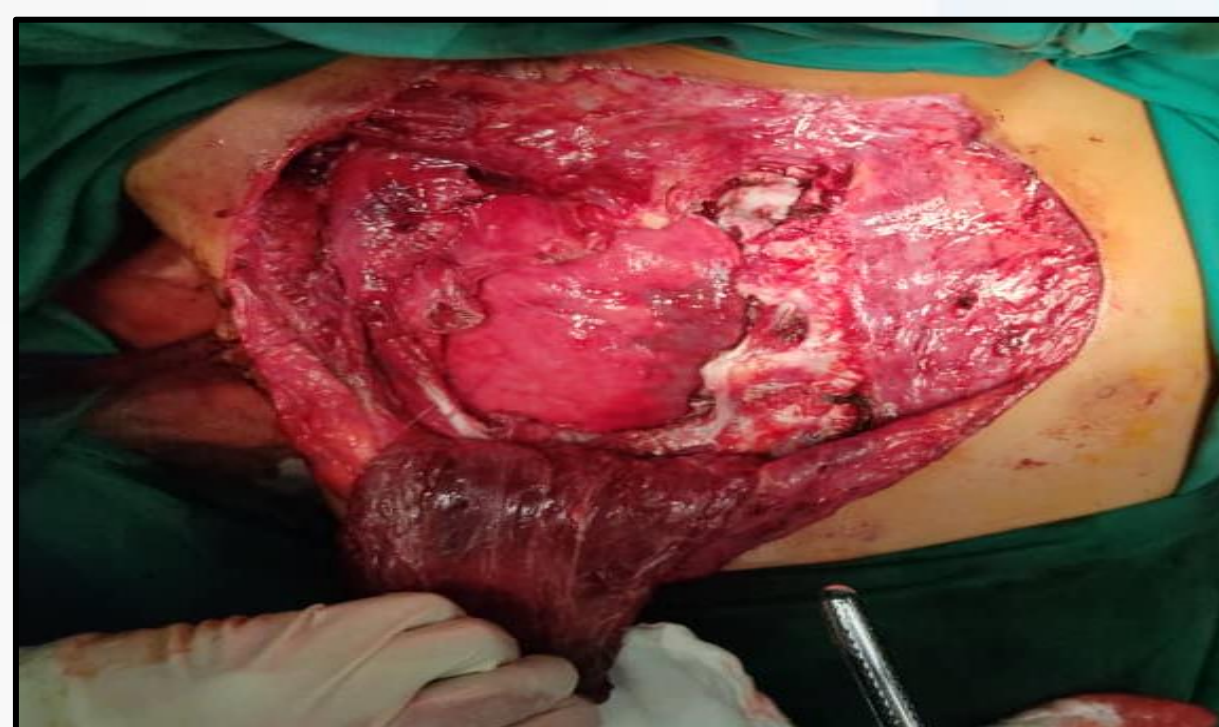
Open pneumothorax with extensive thoracic defect is uncommon in district hospital setting and has high mortality rate. The primary cause of mortality is not necessary due to respiratory failure itself, however could be due to bleeding, infection and multiorgan failure.<sup>1</sup> Therefore, damage control surgery to achieve immediate haemostasis and control of sepsis is life saving procedure which provides positive outcomes for the patient.<sup>2</sup> Successful modified pectoralis major muscle flap for thoracic defect coverage requires surgeon's creativity and knowledge of chest anatomy.

## **REFERENCES**

- (1) Tokuda, R., Okada, Y., Nagashima, F. et al. Open pneumothorax with extensive thoracic defects sustained in a fall: a case report. *surg case rep* 8, 204 (2022). <https://doi.org/10.1186/s40792-022-01555-x>.
- (2) McClintick CM. Open pneumothorax resulting from blunt thoracic trauma: a case report. *J Trauma Nurs*. 2008 Apr-Jun;15(2):72-6. doi: 10.1097/01.JTN.0000327332.69814.b9. PMID: 18690139.



**Figure 1:** Extensive right open pneumothorax with exposed lung.



**Figure 2:** Wound exploration and debridement showed well expanded right lung. Forth and fifth flail rib segments had been removed.



**Figure 3:** Modified pectoralis major muscle flap to achieve proper thoracic defect closure.



**Figure 4:** Skin closure by mobilising skin flap.



**Figure 5 (left):** Wound exploration, abscess drainage and corrugated drain insertion for superficial site infection.

**Figure 6 (right):** Patient discharged home well with secondary wound healing and decannulated tracheostomy.