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Neonatal Tension Pneumothorax

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1. Clinical Image

A 690 g male infant delivered at 24+2 weeks had respiratory distress syndrome treated with Curosurf. Chest X-ray showed pulmonary interstitial emphysema (PIE) changes from day 5 onwards. On day 6 he suddenly developed desaturation with bradycardia, not responding to bagging. Auscultation revealed reduced air entry over right lung; endotracheal tube was changed for suspected blockage. Transient improvement noted. Then, the baby deteriorated again. Repeated auscultation showed markedly reduced air entry over right lung. Transillumination was positive. X-ray confirmed right tension pneumothorax but pneumoperitoneum was unexpected (Figure 1).

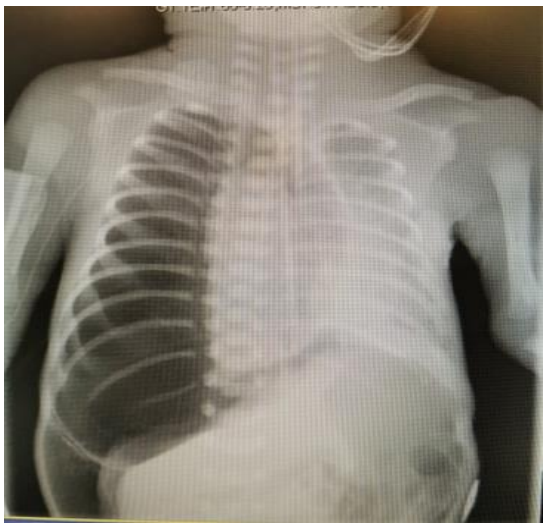

Figure 1: Chest X-ray showing right tension pneumothorax with pneumoperitoneum.

The baby's condition did not improve upon repeated chest tapping and required chest compression and Adrenaline. A chest drain was inserted and the baby then improved. Bowel perforation was once suspected but the infant improved so dramatically after chest drainage and milk feeding was subsequently established, ruling out bowel perforation.

The commonest cause of pneumoperitoneum is perforated gut.

Reviewing our case, the tension pneumothorax most likely arose from endotracheal tube (ETT) displaced into right main bronchus causing one lung ventilation in the emphysematous lung as latest X-ray before pneumothorax showed ETT just above carina. In PIE, elastance and compliance of diseased lungs are compromised; the resultant "double" ventilator pressure might then affect the vulnerable lung tissue and lead to tension pneumothorax. Under tension, air may track through the apertures where the aorta, esophagus, inferior vena cava, splanchnic nerves, roots of the azygous veins and the sympathetic chain traverse the diaphragm leading to pneumoperitoneum. This case highlights the urgent need to reposition ETT close to carina among neonates to avoid tension pneumothorax development from accidental one lung intubation.

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