CLINICAL PRACTICE GUIDELINE
Guideline coverage includes NICU KEMH, NICU PCH and NETS WA

Pneumothorax

This document should be read in conjunction with the Disclaimer

Air leak into the intra-thoracic space is the most commonly encountered air leak syndrome in the newborn. In the presence of underlying lung disease, or in association with high tidal volumes during resuscitation/mechanical ventilation, or active expiration during mechanical breath the incidence of pneumothorax is increased.

The incidence of pneumothorax has decreased significantly since the advent of exogenous surfactant.

Pathophysiology

Pneumothorax results from the over distension and rupture of an alveolus, the air travelling up the vascular sheath into the mediastinum and into the pleural cavity. Uneven ventilation and air trapping both contribute to air leak. Air in the mediastinum seldom produces enough tension to cause circulatory embarrassment but when it does, compression of mediastinal structures can impede venous return and cause circulatory collapse. High pressures within the pleural space collapse the lung and result in hypoxia and hypercapnia.

Clinical Presentation

The condition may present as a sudden deterioration in the infant's clinical state or in the resuscitation room or as marked respiratory distress. There is usually:

- Decreased air entry on the affected side.
- Cyanosis/fall in the oxygen saturations.
- Tracheal deviation to the contralateral side of the pneumothorax.

Investigations

- Transillumination of the chest with an intense beam of light is a useful method of making the diagnosis in an emergency. Refer to Transillumination of the Chest guideline.
- Confirmation by X-ray only if the infant is stable. If the infant is unstable, immediate draining of air is imperative.

Management

- Small pneumothoraces may require no specific treatment apart from observation including progress X-rays and blood gases.
- A larger pneumothorax may be aspirated on one occasion with a needle and 3-way tap attached to a syringe. Refer to Needle Aspiration of the Chest guideline.
- A tension pneumothorax is likely to require insertion of an intercostal catheter with an underwater seal. Waiting for a CXR when the infant is deteriorating can be fatal, therefore aspiration should happen immediately after transillumination, if transillumination is positive.

- If the baby is not deteriorating, wait for a CXR as it can help with positioning of the intercostal catheter. Refer to Intercostal Catheter: Insertion and Pigtail Catheters guideline.

Note: Intubating an infant when it is known to have a pneumothorax can result in further deterioration because positive pressure ventilation will increase the air leak and place it under tension. Drain the air first to stabilise the infant and then intubate under controlled conditions.

Complications and Prognosis

Pneumomediastinum, pneumopericardium and pneumoperitoneum may all also occur. Pneumopericardium and pneumomediastinum occasionally present as emergencies under tension requiring urgent intervention.

The outcome of pneumopericardium when it causes circulatory collapse is invariably fatal unless the air is drained immediately.

Related WNHS policies, procedures and guidelines

Neonatal Clinical Guidelines - Transillumination of the Chest
Neonatal Clinical Guidelines - Needle Aspiration of the Chest
Neonatal Clinical Guidelines - Intercostal Catheter: Insertion and Pigtail Catheters

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