

## **MANAGEMENT OF CRISES DURING ANESTHESIA AND SURGERY. PART VII: PNEUMOTHORAX**

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**P**neumothorax is a possible dangerous situation which may arise suddenly during anaesthesia. The diagnosis is one of exclusion, as initial changes in vital signs (cardiorespiratory decompensation and difficulty with ventilation) are non-specific, and other causes of such changes are more common, whereas local signs may be difficult to obtain, especially without full access to the chest. Diagnosis of pneumothorax during general anaesthesia is difficult, especially as this problem is uncommon. Although there are a number of well recognized high risk conditions, pneumothorax may occur all of a sudden in a patient with no known risk factors. A small, undiagnosed, asymptomatic pneumothorax may become a tension pneumothorax on doing positive pressure ventilation of the lungs after induction of or during anaesthesia. As the systemic signs of pneumothorax are non-specific and the local signs difficult to elicit if access to the chest is restricted, a high level of suspicion and a systematic approach is required for the rapid detection of this potentially hazardous problem<sup>1</sup>.

Pneumothorax is an uncommon problem, especially during general anaesthesia, when the patient cannot complain of respiratory difficulty or pain, and with positive pressure ventilation, which increases the risk of a tension pneumothorax<sup>2</sup>.

### **Signs of pneumothorax :**

- \*Difficulty with ventilation/respiratory distress
- \*Desaturation
- \*Hypotension
- \*Heart rate changes
- \*Unilateral chest expansion: expose, inspect, palpate, auscultate, percuss<sup>3</sup>
- \*Abdominal distension
- \*Distended neck veins, raised CVP
- \*Tracheal deviation

### **Precipitating factors:**

- \*Any needle or instrumentation even days previously in or near the neck or chest wall<sup>4</sup>
- \*External cardiac massage
- \*Fractured rib, crush injury
- \*Blunt trauma
- \*Problem with pleural drain already sited
- \*Airway overpressure, obstructed ETT
- \*Emphysema or bullous lung disease
- \*Tracheostomy

**Emergency management**

- \*Inform the surgeon
- \*Inspect the abdomen or the diaphragm from below if visible
- \*Insert an iv cannula into the affected side just cephalad to the third rib in the midclavicular or midaxillary line and swiftly withdraw the needle as its tip may injure the moving lung.
- \*Turn off nitrous oxide
- \*Insert a pleural drain at the same site. In severe trauma insert the drain just anterior to the midaxillary line to avoid the internal mammary artery which can be injured in midclavicular approach
- \*Continuously observe the bottle for bubbling and or swinging

***If there is further deterioration in the patient it may be due to:***

- Increased or continuing air leak
- Kinked, blocked, or clamped underwater seal drain
- Contralateral pneumothorax
- Misplaced pleural drain tip
- Trauma caused by drain insertion
- Misconnection of drain apparatus

***Further care:***

- If problem persists, consider cardiac tamponade
- Consider pericardiocentesis and or opening the chest
- Arrange a chest x-ray and look for the state of re-expansion of the lung and position of the tip of the drain. A chest x-ray may not detect a non-tension pneumothorax in a supine patient, inspiratory AP and lateral views are preferable and a CT scan is the definitive test.

**References:**

- 1- A K Bacon, A D Paix, J A Williamson, R K Webb, M J Chapman: Crisis management during anaesthesia: pneumothorax. May 20, 2010 - Published by group.bmj.com
- 2- Fossard JP, Samet A, Meistelman C, et al. Life-threatening pneumothorax of the ventilated lung during thoracoscopic pleurectomy. Can J Anaesth 2001;48:493-6.
- 3- Tsarev NI, Pugachev AF, Shelest AL: Diagnosis and treatment of spontaneous pneumothorax. Voen Med Zh 1987;8:51-52.
- 4- Cronen MC, Cronen PW, Arino P, Ellis K: Delayed pneumothorax after subclavian vein catheterization and positive pressure ventilation. Br J Anaesth 1991;67:480-482.