Bilateral asymptomatic pneumothorax in early post-operative period

Sir,

Bilateral asymptomatic pneumothorax in the early post-operative period remains a possible and often challenging anaesthetic concern. We believe that recalling such complication is pedagogical.[1]

A 58-year-old, 176-cm, 62-kg, American Society of Anaesthesiologists physical status I man underwent conservative mandibulectomy. Pre-operative evaluation showed chronic obstructive pulmonary disease related to active smoking of 63-packet years of cigarettes. Tomodensitometry assessment had shown bullous emphysema with numerous blebs at the apices. After establishing routine monitoring, general anaesthesia was induced using propofol, remifentanil and cisatracurium. Nasotracheal intubation was easily performed. Anaesthesia was maintained using desflurane (3–4%) in N_2O-O_2 mixture (50–50), sufentanil and cisatracurium. Mechanical ventilation (MV) was performed using a tidal volume of 7 ml/kg, respiratory rate 12/min, I: E ratio 1:2, peak inspiratory pressure (PIP) of 12–14 cm H_2O, and expired CO_2 ($PETCO_2$) of 30–35 mm Hg. Surgery was performed in the supine position. At the end of the procedure, tracheotomy was performed, and a nasogastric tube was inserted for post-operative enteral feeding. In the post-anaesthesia care unit, the patient was spontaneously ventilating, conscious, calm and pain-free. Transcutaneous oxygen saturation was 98% with O_2 4 L/min, arterial blood pressure was 140/70 mm Hg, and heart rate 75 beats/min. Bilateral pneumothorax was diagnosed on chest X-ray, performed to confirm adequate nasogastric tube positioning [Figure 1]. Two chest tubes were inserted. Tracheo-bronchial endoscopy

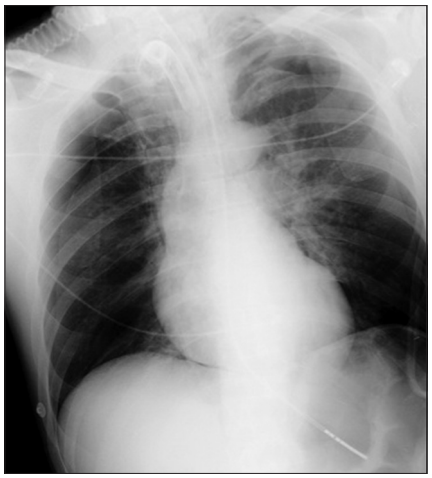

Figure 1: Chest X-ray showing bilateral pneumothorax

excluded a tracheal injury. The drains were removed 4 days later without further complications.

Many risk factors for intraoperative pneumothoraces were identified. During MV, pneumothorax can develop as a result of increasing of PIP caused by bronchial spasm.[1] Pneumothoraces have been reported as a complication of high-frequency jet ventilation.[2] Tracheal injury during mediastinal or neck surgery has been associated with pneumothorax.[3] Carbon dioxide pneumothoraces have been reported during laparoscopic surgery.[4] N_2O has been known for a long time to diffuse into body cavities increasing the volume of pneumothorax.[5] In patients with bullous emphysema, N_2O may increase the volume of bullae increasing the risk of rupture. In patients with bullous emphysema, MV may increase intrinsic positive end-expiratory pressure through gas trapping, resulting in bullous expansion and rupture. Coughing may be a precipitant factor of bullous rupture during MV or when the patient recovers consciousness.[2] Barlow *et al*., investigated 100 patients undergoing tracheotomy and reported a 2% incidence of pneumothoraces, but did not advocate routine chest X-ray following this procedure.[6] Pneumothorax is often diagnosed in a patient with subcutaneous or mediastinal emphysema, oxygen desaturation, circulatory disturbance, or MV impairment with increase of peak pressure.[1,3,4] However, it is likely to go unnoticed post-operatively in a sedated, pain-free patient receiving supplemental oxygen, as in this case. Several risk factors were found in the reported patient including, heavy smoking, bullous emphysema, neck surgery, tracheotomy, MV and using of N_2O. Indeed, N_2O must be avoided in the presence of bullous emphysema. Diagnosis was made on chest X-ray requested for another purpose. Whether chest X-ray must be ordered as a routine during post-operative care in a patient with known risk factors needs to be discussed and agreed to at a local level.

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REFERENCES

1. Lee JY, Kim JU, An EH, Song E, Lee YM. Bilateral tension pneumothorax caused by an abrupt increase in airway pressure during cervical spine surgery in the prone position-A case report. Korean J Anesthesiol 2011;60:373-6.
2. Bellemain A, Ghimouz A, Goater P, Lentschener C, Esteve M. Bilateral tension pneumothorax after retrieval of transtracheal jet ventilation catheter. Ann Fr Anesth Reanim 2006;25:401-3.
3. Stupnik T, Steblaj S, Sok M. Major tracheal tear and bilateral tension pneumothorax complicating percutaneous tracheostomy. Arch Otolaryngol Head Neck Surg 2009;135:821-3.
4. Raveendran R, Prabu HN, Ninan S, Darmalingam S. Fast-track management of pneumothorax in laparoscopic surgery. Indian J Anaesth 2011;55:91-2.
5. Kaur S, Cortiella J, Vacanti CA. Diffusion of nitrous oxide into the pleural cavity. Br J Anaesth 2001;87:894-6.
6. Barlow DW, Weymuller EA Jr, Wood DE. Tracheotomy and the role of postoperative chest radiography in adult patients. Ann Otol Rhinol Laryngol 1994;103:665-8.

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