

A rare cause of acute post-intubation respiratory failure

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A 52-year-old woman with chronic obstructive pulmonary disease (COPD) underwent elective lumbar spinal surgery due to spinal stenosis. The surgery was performed under general anaesthesia, and the patient was intubated using a 7.0 mm wired orotracheal tube (OT). The surgical procedure was uneventful until the transition to supine position, when massive subcutaneous emphysema and acute respiratory failure suddenly appeared. A chest CT scan revealed posterior tracheal wall perforation, the tip of the OT in the mediastinum, massive subcutaneous emphysema, bilateral pneumothoraces and pneumomediastinum (Fig. 1.). Two intercostal chest drains were placed, and selective right main bronchus intubation was performed under flexible bronchoscopy. Subsequently, the patient underwent surgical repair by cervicotomy with interrupted sutures using absorbable threads. Unfortunately, she developed extensive cerebral ischemia due to hypo perfusion and hypoxia, resulting in brain death.

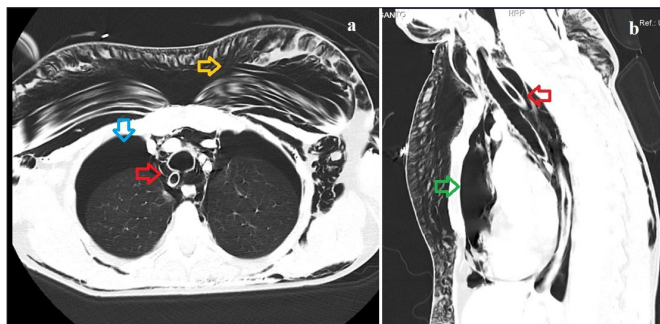


Fig. 1. CT scan images show tracheal perforation in the right lateral-posterior wall, at the point where the upper third and the lower two thirds meet, with 1 cm in length and the tip of the OT located in the mediastinum (red arrow). Extensive subcutaneous emphysema, bilateral pneumothoraces and pneumomediastinum are also seen. A) Axial view B) Corresponding sagittal view.

Tracheal rupture after endotracheal intubation is extremely rare, with a reported incidence of approximately 0.005%.^[1] As reported in this case, tracheal rupture is usually longitudinal and located in the *pars membranacea* of the cervicothoracic trachea. Proposed risk factors that led to this complication include female gender, COPD and prone position during surgery which may decrease respiratory compliance, increase peak airway pressure and displace the OT.^[2,3] Other risk factors include short stature, obesity, tracheomalacia, tracheal stenosis, use of OT introducers, cuff over-inflation, OT repositioning without deflating the cuff, inappropriate tube size and movements of the head and neck. The most common clinical manifestations are subcutaneous emphysema, pneumothorax, dyspnoea and haemoptysis.^[2] Bronchoscopy is mandatory to establish the diagnosis, and to identify the anatomy to choose the appropriate treatment and approach. There are no specific guidelines regarding surgical repair, generally it is considered in ruptures larger than 2 cm, with air leak, or under mechanical ventilation.^[3,4]

Iatrogenic tracheal rupture is a rare condition with fatal consequences if not promptly identified and addressed urgently. Clinicians should be aware of possible risk factors and early signs in order to make an early diagnosis.

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