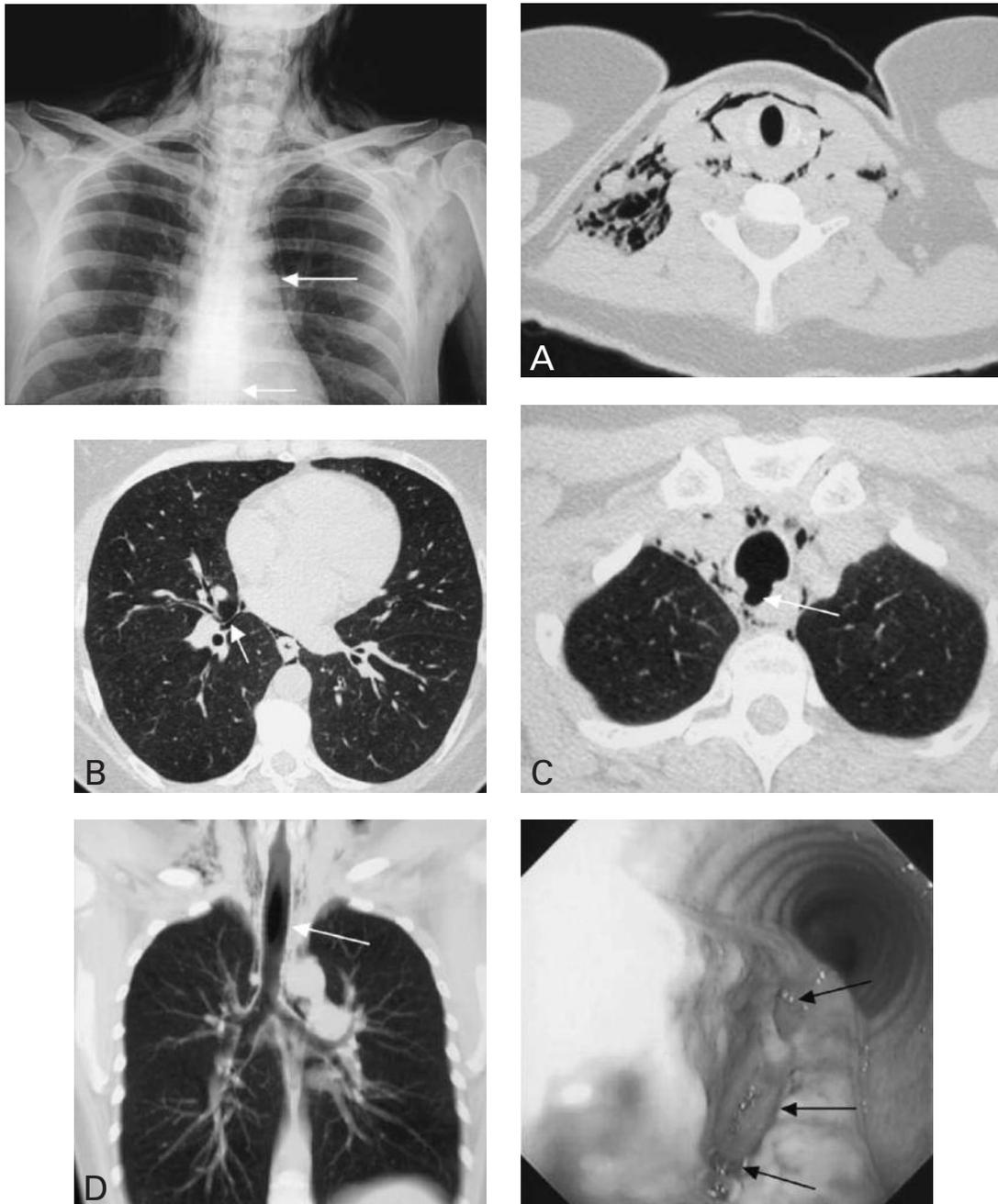


POSTINTUBATION MEMBRANOUS TRACHEAL RUPTURE

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Background: A 41-year-old female underwent general anaesthesia for teeth surgery. No complication occurred during and immediately after surgery. Three days later, she presented to the Emergency Department with retrosternal pain and subcutaneous emphysema at the level of the upper chest and the neck.



Work-up

Chest X-ray (Fig. 1) shows parietal emphysema in the upper chest and neck. Pneumomediastinum is also demonstrated, manifesting as gas lucency outlining the inner surface of left mediastinal pleura (arrow).

CT scan of the chest (Fig. 2) shows air dissecting soft tissues of upper chest and neck and a pneumomediastinum extending until the level of the hila (A). Note extrapleural extension of air simulating a pneumothorax (B, arrow). Axial CT scan close to lung apex (C) and coronal thick MPR reformatted image centred on the trachea (D) reveal a large fusiform defect in the posterior wall of the trachea (arrow).

Fiberoptic bronchoscopy (Fig. 3) performed immediately after CT confirms the large defect involving the membranous wall of the trachea (arrows).

Radiological diagnosis

Based on the clinical history and on the large tracheal defect seen on CT, which was confirmed at bronchoscopy, the diagnosis of *postintubation membranous tracheal rupture* was made.

Discussion

Tracheal laceration is a rare but potentially devastating complication of endotracheal intubation. Anatomy of the trachea and mechanisms of rupture, including overinflated tube cuff, sudden motion of endotracheal tube and direct tear of the trachea, explain the posterior location of the lesions. Therefore the membranous wall or the junction between tracheal membranous wall and cartilage are almost exclusively involved. Inadequate tracheal tube size, repeated attempts at a difficult intubation, double lumen tracheal tube and anatomic abnormalities of the trachea increase the risk of rupture. Small female patients also seem to have a predisposing risk.

Clinical symptoms can occur during surgery, immediately after extubation or within the next 12 hours.

The first signs and symptoms of tracheal rupture include subcutaneous emphysema of the upper chest, neck and head, haemoptysis, and dyspnea and cyanosis in severe cases. Sometimes symptoms can be more insidious and short tears having a spontaneously favourable outcome are probably underdiagnosed.

Radiological signs of tracheal rupture are non-specific. Chest X-ray usually shows a pneumomediastinum and extensive parietal emphysema. Rarely, a pneumothorax can be associated, when the laceration has extended to a main bronchus, particularly on the right side. CT confirms these findings and usually shows the site of rupture and its extension. Bronchoscopy is indicated when CT findings are suggestive of tracheal laceration.

Management of tracheal rupture is controversial and the choice between conservative versus surgical treatment is debated. Conservative treatment, include broad spectrum antibiotherapy, antiseptic and anti-inflammatory aerosoltherapy, cutaneous incisions with massages in extensive subcutaneous air and rarely percutaneous mediastinal drainage. It is generally indicated for stable and non-symptomatic patients with a distal tracheal rupture less than 4 cm in length. Surgical treatment is recommended for symptomatic and unstable patients and for laceration of more than 4 cm. It will be performed through a cervicotomy when the laceration is located in the upper two thirds of the trachea and through a thoracotomy for rupture manifesting during a thoracic surgical procedure (immediate repair), and for tears involving the distal trachea, a main bronchus, or both.

Clinical outcome is generally favorable. Nevertheless complications, including mediastinitis, tension pneumomediastinum or even tension pneumoperitoneum have been reported.

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