Complete airway obstruction in a ventilated patient after oesophageal dilatation

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A case of instrumental perforation of the oesophagus is presented. This caused systemic sepsis, requiring tracheal intubation and positive pressure ventilation. Sudden unexpected life-threatening airway obstruction was caused by distal tracheal compression by a peritracheal abscess. The aetiology and management of distal tracheal obstruction is discussed.

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Circumferential compression of the trachea is very unusual, having been reported previously in the presence of mediastinal tumours.\(^1\) It can cause complete lower airway obstruction and is usually insidious in onset. Tracheal compression by mediastinitis has not to our knowledge been described. This case report describes this condition and illustrates the rapid onset.

Case report

A 68-yr-old female presented with dysphagia and an enlarged submandibular lymph node. She underwent oesophagoscopy, pharyngoscopy and laryngoscopy, and excision biopsy of the lymph node. The procedure was uneventful, but the next day she developed surgical emphysema involving the upper chest and neck. A gastrograffin swallow showed a leak of radiographic contrast from the upper oesophagus but the exact location was unclear. A nasogastric tube was passed. She was not given any oral intake and the nasogastric tube was used for free drainage. Treatment with cefuroxime and metronidazole was started. Over the next 48 h she became dyspnoeic and hypoxic. Her ventilatory frequency was 20–25 min\(^{-1}\) and an \(F_{\text{IO}_2}\) of 0.5 was required to maintain a \(S_{\text{O}_2}\) greater than 90%. Chest x-ray showed bilateral basal lung collapse and consolidation.

Her respiratory function deteriorated (\(P_{\text{aO}_2}\), 9.6 kPa, \(F_{\text{IO}_2}\), 1.0) and she was transferred to the intensive care unit for tracheal intubation and artificial ventilation. She developed systemic sepsis, which was considered to be caused by a hospital-acquired pneumonia. Epinephrine and dobutamine were started to maintain her arterial pressure and urine output. A pulmonary artery flotation catheter was sited, and the initial measurements were: cardiac output was 5.8 litre min\(^{-1}\), systemic vascular resistance was 797 dyne s\(^{-1}\) cm\(^{-5}\), pulmonary artery capillary wedge pressure was 20 mm Hg, and central venous pressure was 10 mm Hg.

She received artificial ventilation with BIPAP (bilevel positive airway pressure) with an inspiratory pressure (\(P_{\text{insp}}\)) of 24 cm H\(2\)O and PEEP (positive end expiratory pressure) of 5 cm H\(2\)O. Therapy with ciprofloxacin was commenced in addition to cefuroxime and metronidazole. Daily chest x-rays revealed persistent changes in both bases, but no suggestion of mediastinal collection.

On the tenth postoperative day a sudden decrease in minute volume with reduced delivered tidal volume was noted. Initially it was thought that the tracheal tube might have been dislodged or displaced against the tracheal wall or
above the vocal cords. A bougie was inserted through the tracheal tube and the tube advanced further down to 24 cm from the lips. Because ventilation improved, a check laryngoscopy was not performed and other diagnoses, such as tension pneumothorax seemed unlikely. However, shortly afterwards difficulties recurred with inadequate ventilation despite increasing the inspiratory airway pressure.

An urgent fibreoptic bronchoscopy was done, where it was seen that the tracheal tube had moved back to the original position of 22 cm and the trachea was swollen and inflamed with complete circumferential occlusion at that level. The tracheal rings were not visible, the posterior tracheal wall was bulging at 24 cm, and the carina looked swollen with marked oedema. The tracheal tube was advanced to just above the carina, which allowed satisfactory ventilation with the previous airway pressures.

A chest x-ray now showed widening of the upper mediastinum. A contrast-enhanced CT scan (Fig. 1) showed a large low attenuation lesion containing pockets of gas seen in the prevertebral region of the neck and upper chest, extending on either side of the trachea from the superior cornua of the thyroid to the carina. The oesophagus and trachea were displaced anteriorly.

The features were consistent with inflammatory changes in the neck and upper chest, and bilateral basal consolidation and pleural effusion. It was decided that surgical drainage was indicated because of sepsis and tracheal compression. She had a right thoracotomy with drainage of the mediastinal abscess and both pleural effusions. Drains were placed in both pleural spaces and the superior and inferior mediastinum (32F).

Her gas exchange remained poor.

A tracheostomy was performed on day 14 to improve weaning and over the next 3 weeks her condition improved. All the drains except one of the mediastinal drains were removed. After 24 days of intensive care she was transferred to the ENT ward. Total oesophagectomy was considered, but with conservative treatment a controlled oesophago-cutaneous fistula developed. Her condition gradually improved. After a further 2 months she was able to eat and mobilize, and was discharged home.

Discussion

Instrumental perforation of the oesophagus was followed by a peritracheal abscess, causing sudden, unexpected life-threatening airway obstruction. Circumferential compression of the trachea is very unusual, having been reported previously in the presence of mediastinal tumours, but not to our knowledge with mediastinitis.

Oesophageal perforation can occur spontaneously with vomiting or retching, or after instrumentation. It is estimated that the incidence is approximately 1 in 100 rigid oesophagogastroduodenoscopies. The commonest early symptoms are acute chest pain, epigastric pain, and dyspnoea. Signs include surgical emphysema, or signs of pneumothorax or mediastinal air. The diagnosis is usually confirmed with chest x-ray and contrast swallow.

The management of oesophageal perforation depends on the level and size of the perforation. With instrumental perforations this is usually conservative, with complete fasting, nasogastric suction, and broad-spectrum antibiotics, if the diagnosis is made before mediastinal contamination.

![Fig 1 A contrast-enhanced CT scan demonstrated a large low attenuation lesion containing pockets of air seen in the prevertebral region of the neck and upper chest. The trachea is held open by the tracheal tube.](image-url)
Coronary artery spasm and myocardial infarction under spinal anaesthesia

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Vasovagal episodes occur frequently in young healthy patients undergoing venous cannulation and loco-regional anaesthesia. We report two cases of severe coronary vasospasm and non-Q-wave infarction in healthy young women after administration of ephedrine for vasovagal