Tracheo-oesophageal fistula and upper airway leak in the intensive care unit

Editor—A 76-yr-old woman was transferred to our intensive care unit (ICU) having become ill overseas requiring ICU admission for circulatory and ventilatory support. The acute motor axonal neuropathy variant of Guillain–Barre syndrome was diagnosed.

She had been intubated with a high volume–low pressure oral endotracheal tube (ETT) for 23 days before transfer without event and was enterally fed via a nasogastric tube. During the transfer flight, ventilation became difficult with loss of tidal volume and an upper airway leak. No cause was found and it settled spontaneously. On arrival at the ICU, an obvious leak was audible. A new Portex ETT was inserted, but despite this, an intermittent upper airway leak persisted. Two days later, a marked non-positional leak developed and ventilation was inadequate.

On laryngoscopy, the ETT passed through the vocal cords with a subglottic balloon. Cuff pressure was maintained, and the transient increase to 70 cm H₂O had no effect. Fibreoptic bronchoscopy through a replacement ETT was non-diagnostic. In the operating theatre, the ETT was removed, jet ventilation used, and rigid bronchoscopy performed. Uneventful percutaneous tracheostomy was performed by the consultant in intensive care medicine. The audible leak persisted after this change, repeat direct laryngoscopy showed air bubbles originating from the oesophagus. With the tracheostomy cuff deflated, the nasogastric tube was seen through the posterior wall of the trachea at fibreoptic bronchoscopy (Fig. 1). Tracheo-oesophageal fistula (TOF) was diagnosed. The airway was controlled using a size 8 Mallinckrodt ETT with the bevelled tip cut off placed via the tracheostomy stoma to just above the carina. The Mallinckrodt tube has a longer balloon cuff, 50 vs 35 mm of the Portex ETT. It was secured using the flange from a Portex adjustable flange tracheostomy set.

After consultation with thoracic and upper gastrointestinal surgeons, the fistula was managed conservatively with operative repair if ventilatory support could be weaned. Unfortunately, no neurological recovery was made and the patient died on day 45 of her admission.

TOF is rare in the absence of malignancy or recent surgery. Causes include closed or open chest trauma, granulomatous mediastinal infections, immunodeficiency syndromes, and iatrogenic trauma. Acquired TOF secondary to the ETT cuff or tracheostomy has replaced granulomatous infection as the primary cause of non-malignant TOF with an incidence of 0.5%. Most are associated with long-term ventilation and use of a nasogastric tube.¹

TOF should be considered in patients with unexplained upper airway leaks. ‘Cuff leaks’ are common scenarios in the ICU, usually remedied by replacing the ETT after checking that the cuff is subglottic and assessing the pilot balloon or cuff pressure. Smith and colleagues² described non-malignant TOF presenting as an upper airway leak and inadequate ventilation at intubation in the anaesthetic room. They emphasize that traditional methods of assessing endotracheal placement may not help when a TOF is present. The tube is seen passing through the vocal cords, breath sounds may be heard bilaterally, and chest radiography of endotracheal and tracheostomy tubes may not show malposition. Capnography may be normal or show the non-specific loss of ventilation obvious from other ventilator measures. Correct diagnosis relies on the suspicion of TOF by the clinicians involved.

Immediate management involves securing the airway and maintenance of oxygenation and ventilation. This is best done by placing the ETT cuff distal to the TOF within the trachea. Correct placement can be checked via bronchoscopy and increase in tidal volumes. Other complications of TOF include pneumonia or pneumonitis and inadequate nutritional intake further complicating recovery. Spontaneous closure of a documented TOF is extremely uncommon and operative closure is always necessary, but the timing and type of repair require careful consideration.³

After tracheal repair, prolonged positive pressure ventilation increases the risk of anastamotic dehiscence and stenosis. Others suggest surgery be postponed until the patient is weaned from mechanical ventilation.³ Successful resolution of a TOF in a ventilated patient using a combination of tracheal stenting and surgical repair has been

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Fig 1 Tracheo-oesophageal fistula. The nasogastric tube is seen through the defect in the posterior wall of the trachea.
reported. Open, thoracoscopic, endotracheal, and oesophageal stenting procedures have all been described; the approach in a given situation is best guided by local expertise and experience.

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Day case surgery and obesity: a changing perspective

Editor—The practice of anaesthetizing morbidly obese patients as day cases has changed radically in recent years. We would like to add a slightly different perspective on this issue to that expressed by Ryan and colleagues. There is no evidence of significant morbidity in the immediate postoperative period when treating morbidly obese patients as day cases. The Association of Anaesthetists of Great Britain and Ireland have recommended that obese patients should not be excluded from day surgery based on their body mass index (BMI) alone.

It is the standard practice in our hospital trust to accept morbidly obese patients for day surgery where management would not be modified if admitted as an inpatient. All patients booked for a procedure in the Day Surgery Unit undergo a nurse-led preoperative assessment, but an experienced anaesthetist reviews the notes of patients with a BMI of more than 36 kg m⁻². Between September 2003 and June 2005, the Day Surgery Unit increased its caseload by 13%. Of the 6940 patients with a known BMI, 434 (6.2%) patients had a BMI of >35 (an increase of 68%), 117 (1.7%) had a BMI >40, and 16 (0.2%) were >45. There were fewer unplanned admissions in patients with a BMI >35 (1.2%) when compared with those with a BMI <35 (2.7%), but this did not reach statistical significance.

The obese patient presents specific challenges to both surgeons and anaesthetists. The adverse events are as likely to occur in an inpatient setting as in a day case setting. Although an increased risk of adverse events intraoperatively and in the immediate recovery period in obese patients has been reported, these have not been shown to significantly increase unplanned admissions. Avoidance of hospital admission by choosing ambulatory surgery should therefore result in improved patient satisfaction and significant cost savings without compromising clinical care. Where patients have access to appropriate preparation and expertise, obesity alone should not exclude patients from ambulatory surgery and the latter may offer some benefits over inpatient admission.

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