A rare cause of tracheal obstruction unrelieved by tracheal intubation

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A 50-year-old man presented with a 4-day history of cough on eating and drinking. He was known to have an oesophageal carcinoma for which he had received chemotherapy and radiotherapy initially and latterly dilatation and laser therapy. Oesophagoscopy revealed the tumour to be at 20–25 cm with a 6–8 mm tracheoesophageal fistula at 22 cm, which was treated by insertion of a Celestin oesophageal stent under sedation with midazolam and pethidine. Insertion of the stent was uncomplicated, but immediately afterwards the patient experienced severe dyspnoea and stridor so emergency anaesthetic assistance was sought.

We found the patient to be severely distressed and uncooperative, using accessory muscles of respiration and generating breaths of negligible tidal volume. There was no longer any evidence of stridor, presumably because of insufficient airflow. His oxygen saturation was 87% and decreasing, despite supplemental oxygen being administered. The presumed cause of the airway obstruction was tracheal compression by the stented carcinoma, so it was essential to secure the airway before endoscopic removal of the stent.

The following options for securing the airway were considered:

1. Tracheal intubation while breathing spontaneously under deep inhalational anaesthesia
2. Tracheostomy under local anaesthesia
3. A rapid sequence induction of anaesthesia using suxamethonium to facilitate tracheal intubation.

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Although option 1 is considered to be the safest method of managing the difficult airway, it was rejected as the patient's ventilation was insufficient to make it a practical solution in this rapidly deteriorating clinical situation. Lack of patient cooperation and time available also made option 2 impractical.

We decided to perform a rapid sequence induction as this gave us the only realistic chance of securing the airway before the patient suffered a hypoxic arrest. There was no reason to suspect a difficult laryngoscopy as the obstruction was below the level of the larynx and we hoped that the presence of the endotracheal tube (ETT) might relieve the obstruction until the stent could be removed.

After a rapid sequence induction technique using propofol (as it was most readily available) and suxamethonium, laryngoscopy revealed a Grade I intubation. Anaesthesia was maintained with oxygen and isoflurane. Despite apparently easy ventilation, chest movement was diminished and capnography revealed a poor return of exhaled carbon dioxide with a very obstructed trace. This was slightly improved when the tube tip was withdrawn to the vocal cords and the oxygen saturation rose to 95%.

A flexible bronchoscopy via the tube revealed that the oesophageal stent had torn through the posterior tracheal wall and now obscured the whole of the trachea so that the larynx and sub-glottis were in communication with the oesophagus and stomach. As ventilation and oxygen saturation were deteriorating, and no obvious route to the lower trachea could be found, we decided to use a high frequency jet technique using the available Penlon Bromsgrove humidified jet ventilator. This would allow oxygenation to occur through any small tracheal orifice present, and is an accepted method of ventilating patients with severe periglottic stenosis (Young et al, 1995).

The ventilator was set at a rate of 100 breaths/minute and the Luer connector secured to a suction catheter placed just between the vocal cords. The patient's oxygen saturation now improved to 98% and anaesthesia was maintained with incremental propofol and neuromuscular blockade with atracurium.

A more prolonged bronchoscopic examination eventually found a small tracheal orifice on the lateral tracheal wall just above the stent through which another ETT was railroaded and conventional ventilation was resumed.

A decision was made to relieve the obstruction by using the gastroscope to push the stent into the stomach. This was now impossible via the oesophagus so, after adequate pre-oxygenation, the ETT was removed and the stent pushed into the stomach via the larynx. The trachea was re-intubated and the tube's position confirmed by bronchoscopy. A 4 cm tracheoesophageal fistula was seen.

The patient was recovered without further problems and returned to the ward. He underwent uneventful percutaneous endoscopic gastrostomy 4 days later and was discharged home. HM

Young SS, Wang SJ, Lin SY, Jih KS, Tso HS (1995) An urgent technique of applying high frequency jet ventilation in patients with extreme periglottic stenosis. *Acta Anaesthesiol Sin* **33 (1):** 63–8