

## ABSTRACTS

**Abstracts from the Difficult Airway Society meeting 2014**

Stratford-upon-Avon, UK, November 12–14, 2014

(The name of the person presenting the paper is shown in bold type. All authors have certified that, where appropriate, studies have been conducted with the approval of the relevant Human Ethics Committee or Animal Experimental Review Committee.)

**An unusual perioperative complication: a case of postintubation tracheal rupture**A. Anwar<sup>1</sup>, M. Hulgur<sup>1</sup> and P. Lanka<sup>2</sup>

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We discuss a patient who experienced iatrogenic postintubation tracheal rupture for an L5/S1 discectomy under general anaesthesia. Tracheal rupture is often linked with blunt trauma, but is a rare complication after intubation with a high morbidity and mortality. It has a reported incidence of one in 20 000 intubations.

**Case report**

A 41-yr-old female with a BMI of 38 kg m<sup>-2</sup> and short stature was admitted for an L5/S1 discectomy. She was an ASA II patient with a history of migraine. Anaesthesia was maintained with desflurane, and no nitrous oxide was used. Oral intubation with a cuffed 7.5 mm reinforced tracheal tube was unremarkable with Cormack Grade 1 laryngoscopy. The cuff was inflated with an unknown volume of air, and no cuff pressures were measured. The patient was placed prone for surgery, which lasted 2 h with normal airway pressures and no desaturations. In recovery, she had an explosive cough with blood-stained sputum and suddenly developed a large neck swelling. On examination she was haemodynamically stable with a central trachea, but there was bilateral surgical emphysema. Initial differential diagnosis included a ruptured bulla or Boerhaave syndrome. A chest X-ray showed a widened mediastinum with no pneumothorax (Fig. 1). The patient was transferred to the high-dependency unit with an ear, nose, and throat review. A computed tomography scan showed a defect in the posterior wall of the trachea at the level of T1 measuring 2.5 cm in length and 9 mm in diameter (Fig. 1). The patient was discussed with cardiothoracic surgeons, who advised conservative management. No bronchoscopy was undertaken. The swelling reduced in size after 3 days, and the patient was discharged, with follow-up showing her to make a full recovery.

**Discussion**

Patient risk factors for tracheal tears include being female, short stature, and obesity. Higher prevalence in women is attributable to a weaker pars membranosa and use of inappropriate tracheal tube sizes. In this instance, the female patient was of short height, and prone positioning may have led to pressure of the tracheal tube cuff and thinning of the posterior tracheal membrane. Over-expansion of the tracheal tube cuff without measurement of cuff pressures can lead to tears and may be a cause in this patient. Best practice may be to listen when inflating the cuff to seal the leak and to deflate and reinflate the cuff during long procedures to prevent increases in cuff pressures. Emergency intubation<sup>1</sup> is a main risk factor and increases the risk of death compared with elective intubation. The definitive investigation is urgent bronchoscopy, allowing for the direct examination of the trachea, with chest X-rays and computed tomography scans assisting with diagnosis. There is no consensus for management, but the current trend is to minimize invasive surgery by conservative management.<sup>2</sup>

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**Oxygen delivery during awake fibre-optic intubation: a case series using high-flow nasal cannula**

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Awake fibre-optic intubation (AFOI) is a widely practised technique for anticipated difficult airway management. The most frequently used interfaces to provide oxygen during the procedure are low-flow devices, such as a nasal cannula, a face mask, a

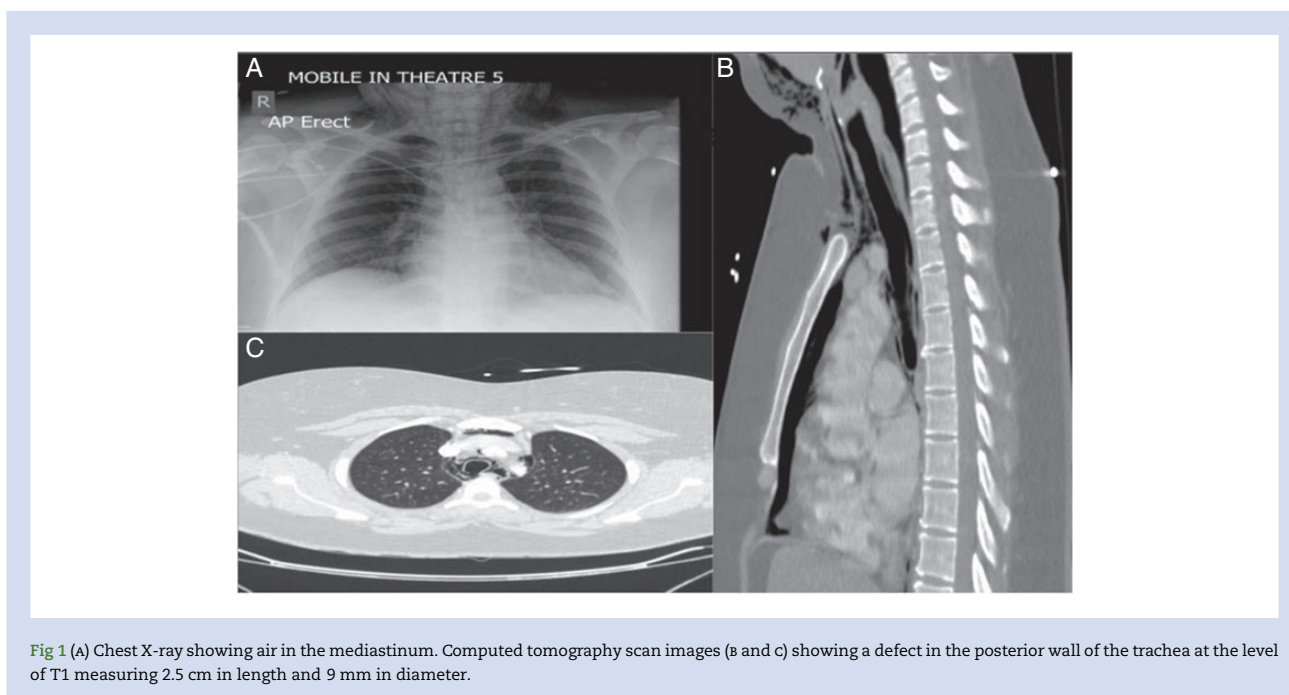


Fig 1 (A) Chest X-ray showing air in the mediastinum. Computed tomography scan images (B and C) showing a defect in the posterior wall of the trachea at the level of T1 measuring 2.5 cm in length and 9 mm in diameter.

nasal sponge, a suction catheter placed in the nostril, or via the working channel of the fibroscope. High-flow humidified nasal oxygen therapy is an alternative method of delivering oxygen, and in recent years, has been increasingly adopted across many clinical areas.

### Case series

We reviewed 25 patients for whom AFOI was performed using Optiflow™ (Fisher & Paykel Healthcare, Maidenhead, UK) to deliver oxygen. All patients were adults with complex oropharyngeal or laryngeal pathology. The mean (SD) BMI of the patients was 27.25 (7.98) kg m<sup>-2</sup>.

Median [interquartile range (range)] baseline oxygen saturation (Sp<sub>O<sub>2</sub></sub>) was 98 [97–99 (95–100)]%. The oropharynx was anaesthetized in all patients using lidocaine 4%, and cocaine 100 mg was applied to the nasal passage in the 19 patients requiring nasal intubation. Conscious sedation was administered via target-controlled infusions of remifentanyl and propofol. Optiflow™ 30–60 l min<sup>-1</sup> was applied from before the onset of sedation until successful tracheal intubation was confirmed and the tracheal tube connected to the anaesthetic circuit, a mean (SD) time of 19.38 (2.82) min. Median [interquartile range (range)] Sp<sub>O<sub>2</sub></sub> and end-tidal carbon dioxide immediately postintubation was 100 [100–100 (99–100)]% and 4.8 [4.0–5.1 (3.5–6.1)] kPa, respectively. There were no desaturations during any procedure despite one instance of oversedation and temporary apnoea. During the routine postoperative visit, all patients reported a comfortable experience in terms of oxygen application.

### Discussion

Hypoxaemia is a risk during AFOI because of the pre-existing nature of the pathology, complications such as spasm or bleeding during the procedure causing airway compromise, the depressant effects of sedation administered, and the local anaesthesia

application itself. Previous AFOI studies have shown the incidence of desaturation below 80% to be 1.5% with a low-flow nasal cannula,<sup>1</sup> and significant desaturation has been reported in groups using a nasal probe.<sup>2</sup> Using a high flow ensures that a higher fractional inspired oxygen is delivered and provides a nasopharyngeal reservoir of oxygen and a low level of positive expiratory pressure.<sup>3</sup> We also found that the high flow helps the spread of local anaesthetic applied around the nasopharynx. The humidification of inspired gases ensures patient comfort and aids mucociliary clearance. Our case series suggests that high-flow nasal cannulation can be tolerated in patients undergoing AFOI and may minimize the potential risk of desaturation.

### References

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### Pilot feasibility study into the role of virtual endoscopy in the pre-anaesthetic assessment of oral and maxillofacial surgery patients

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Fibre-optic intubation is the gold-standard intubation technique in a suspected difficult airway, but it is invasive and is often not well tolerated. Computed tomography virtual endoscopy (CTVE) is an imaging technique that allows non-invasive, three-dimensional dynamic assessment of the upper aerodigestive

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