The bradyarrhythmias completely resolved upon recognition of the issue and subsequent rewarming above 30°C.

Automated surface-cooling or endovascular-cooling devices automatically maintain core temperature at a set target temperature by actively cooling or rewarming patients based on the feedback provided by a temperature probe monitoring the patient’s core temperature. Preferred sites for core temperature monitoring include the oesophagus and the urinary bladder.

In both cases presented here, heated humidifier devices with an operating temperature range of 35–40°C (MR850®, Fisher and Paykel, Auckland, New Zealand) were connected to the respiratory circuits. Close anatomical proximity of the actively heated tracheal tubes to the oesophageal temperature probes caused significant heat transfer from one device to the other, leading to gross overestimation of patients’ core temperatures and subsequent overcooling (Fig. 1).

Given the widespread use of therapeutic hypothermia, it is important to stress the concept that placement of oesophageal probes in the lower third of the oesophagus (i.e. far from the trachea and closer to the heart and aorta) is critical for adequate monitoring of core temperature in ventilated patients. Although urinary bladder and intravascular temperature probes are less prone to temperature overestimation caused by heat transfer from warmed tracheal tubes, these are not immune from other causes of malfunction. Therefore, automated cooling devices that are controlled by a single temperature probe pose a significant safety issue if the temperature probe malfunctions or is poorly positioned.

In order to prevent accidental overcooling, regular cross-checks of body temperature at two different sites must be included in all protocols of therapeutic hypothermia. A significant difference between readings at different sites should trigger prompt verification of the temperature probes positioning and accuracy, preventing life-threatening complications associated with accidental overcooling.

Fig 1 Chest CT scan at the level of third thoracic vertebra showing close contiguity between the tracheal tube and the oesophageal temperature probe. Probes placed in the proximal half of the oesophagus can significantly overestimate core temperature leading to overcooling and potential harm to patients.

Management of postoperative respiratory failure in a patient with acute diaphragmatic status dystonicus

Editor—Primary generalized dystonia is a progressive, disabling movement disorder that usually begins in childhood and is linked to several genetic loci.1 The prevalence of early-onset primary torsion dystonia is estimated in population studies to be as low as 0.7 per million or as high as 50 per million.2 Patients with dystonic syndromes occasionally develop severe episodes of generalized dystonia and rigidity, which can be refractory to standard drug therapy. The most severe cases can develop bulbar and ventilatory complications.3,4 As deep-brain stimulation (DBS) of the internal globus pallidus (Gpi) has become an increasingly common neurosurgical treatment,5 the anaesthetic management requires special considerations.6

We report a case of severe postoperative diaphragmatic dystonia requiring tracheostomy and immediate reimplantation of Gpi DBS. A 56-yr-old lady was admitted to our institution for re-implantation of a permanent quadripolar electrode (Medtronic Inc. 3387, Minneapolis, MN, USA) into the left Gpi for DBS under general anaesthesia. On admission, the patient’s dystonic symptoms were well controlled with daily doses of tiapride, baclofen, tetrazepam, and lorazepam. She was cardiovascularly stable and showed no signs of a respiratory-tract infection. Evaluation of the previous anaesthetic record of the primary surgical bilateral implantation revealed a difficult airway with a Cormack/Lehane view grade 3, requiring the use of a Bullard laryngoscope. The airway management was compromised by her torti-/laterocollis and her poor tongue movement. Owing to these reported findings, the anaesthetist opted for an awake fibreoptic tracheal intubation for the elective re-implantation procedure.

After topical analgesia with a lidocaine nebulizer, the patient’s trachea was intubated using a 5 mm flexible bronchoscope. After visual identification, the trachea was intubated with an ID 7.0 mm reinforced tracheal tube. The correct placement was confirmed by capnometry and anaesthesia was induced and maintained with propofol and

Declaration of interest

None declared.

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remifentanil infusion. After uneventful surgery, the emergence from anaesthesia was complicated by excessive airway pressures. The patient had a silent chest on auscultation and was treated for bronchospasm using a salbutamol nebulizer and i.v. reprotrol without any signs of improvement. Anaesthesia had to be deepened and continued by propofol and remifentanil infusion, and the patient was admitted to the intensive care unit (ICU). The chest X-ray showed no pathological findings, but gas exchange was only possible during deep sedation levels and muscle paralysis with rocuronium. Despite careful titration of sedation and peripheral neuromuscular monitoring, severe refractory diaphragmatic dystonia impeded weaning from mechanical ventilation. Owing to her difficult airway, the patient had a surgical tracheostomy on the second postoperative day. Simultaneously, DBS of the re-implanted left electrode was initiated (G+, 1−, 2.0 V, 90 μs, 130 Hz). Within 24 h, the diaphragmatic dystonia was significantly improved, allowing spontaneous ventilation with minimal pressure support. The patient has completely recovered and the tracheostomy was closed a few weeks after this incident.

Dyspnoea in dystonia is reported to be associated with spasmodic contractions and dysfunction of either the upper airway (vocal folds, larynx, tongue, and uvula) or the diaphragm. Respiratory failure due to upper airway dysfunction can be managed by tracheal intubation, needle cricothyroidotomy, or tracheostomy. However, the management of severe diaphragmatic dystonia is more complex. These rare conditions not only require a safe airway but also a functional diaphragm. Because the dystonia was refractory to tiapride, baclofen, tetrazepam, and lorazepam, the immediate re-implementation of Gpi DBS appeared to be very effective in the acute management of respiratory failure due to a diaphragmatic status dystonicus.

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