Twin anaesthetic challenges in a patient recovered from Guillain–Barre syndrome

Sir,

A 6-year-old female child weighing 15 kg presented to our emergency department (ED) with respiratory distress. She had inspiratory stridor and hypoxaemia (peripheral oxygen saturation 84%). About 4 months back, she had been diagnosed with Guillain–Barre syndrome (GBS) in view of the typical features including ascending paralysis, areflexia and respiratory muscle involvement. She had required mechanical ventilation soon afterwards and had exhibited a gradual but spontaneous recovery with extubation after 2 weeks, following which she was discharged. After discharge, she had been initially asymptomatic, but later reported hoarseness of voice along with mild breathing difficulty.

When we tried to intubate her in the ED, we encountered difficulty in intubation. Direct laryngoscopy was suggestive of suspicious subglottic obstruction. An emergency tracheostomy under local anaesthesia had to be performed. Evaluation with laryngotracheobronchoscopy revealed that she had developed a subglottic web. This was probably a consequence of intubation and mechanical ventilation in her previous admission. A laser excision of this subglottic web was planned.

The two anaesthetic challenges in this case were as follows: firstly, the risk of airway fire and secondly, the risk of prolonged neuromuscular blockade (NMB) in GBS patients. Laser-resistant tracheostomy tubes (TTs) were not available with us. We approached the challenge of airway fire by using a one size smaller uncuffed TT wrapped with an aluminium foil [Figure 1]. We used plasma sterilisation to ensure that this modified tube did not carry the risk of infection. Saline-soaked gauze was placed over the TT to further reduce the risk of airway fire. The second challenge is well known. GBS patients are sensitive to neuromuscular blocking drugs (NMBD). Hence, their use carries the risk of prolonged paralysis and need for mechanical ventilation. Our anaesthetic plan did not include muscle relaxants.

Standard American Society of Anesthesiologists (ASA) monitoring was performed along with bispectral index (BIS) monitoring. TT was connected to a closed-circuit system, and induction was done with injection propofol (2.5 mg/kg), fentanyl (2 µg/kg) and sevoflurane in oxygen with air (1:1). The propofol infusion was titrated to achieve the desired depth of anaesthesia, keeping BIS between 40 and 60. Lignocaine 4% spray was sprayed over the vocal cords and oral cavity to decrease stimulation by instrumentation. Additionally, in order to blunt the pressor response to airway stimulation during surgery, 1.5mg/kg of injection lignocaine (2%) was given. The fraction of inspired oxygen was reduced to 0.3 during the surgical procedure. Excision of subglottic web was done using carbon dioxide laser without any adverse event and the patient was awakened after changing TT and switching off the propofol infusion. A check fibreoptic bronchoscopy (FOB) was done to rule out any foreign body left in the trachea. There was no muscle paresis or respiratory distress in the postoperative period. She had an uneventful recovery and was discharged with TT in situ. Gradual decannulation was done over a period of 45 days.

Laser airway surgeries carry a high risk of airway fire. The triad of airway fire, which includes an oxidising agent (e.g. oxygen), a combustible material (e.g. endotracheal tube) and a source of ignition (laser), is unavoidable in such situations. Laser-resistant endotracheal tubes and TTs are indispensable for laser surgeries. However, laser-resistant airway tubes are difficult to source, especially in paediatric sizes. Wrapping the airway tube with aluminium foil reduces the risk of fire and has been successfully used in a few cases earlier. This technique, however, carries the hazard of retention of the foil fragment in the airway, leading to a dangerous
foreign body.[4] Hence, a careful inspection of the tube and a check FOB should be performed.

During the acute presentation of GBS, both succinylcholine (risk of hyperkalaemia) as well as non-depolarising muscle relaxant (prolonged paralysis) are potentially dangerous.[5] The mean time to recovery after GBS is around 3 months, and some patients do not have a complete recovery. Further, in chronic demyelinating conditions, prolonged effects of NMBD have been described.[6] Even though our patient had made a clinical recovery, we avoided using NMB.

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**Conflicts of interest**

There are no conflicts of interest.

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