Anesthetic management of a patient with severe neck dystonia during MRI

Sir,

Anesthesia for diagnostic services in neurologically ill patients with airway related problems is challenging for the anesthesiologist, especially at remote locations like magnetic resonance imaging (MRI) suite. Multiple system atrophy (MSA) is a heterogeneous neurodegenerative disease of the central and autonomic nervous system and is categorized into MSA with the predominant parkinsonism and MSA with predominant cerebellar ataxia (MSA-C).[1] These patients often present with neck ante flexion and sleep-related breathing disturbances which make both lying supine for long periods and deep sedation difficult.

A 56-year-old male with 8-year history of unsteadiness of gait, slurring of speech for the past 5 years, presented to our hospital for MRI brain with a possible diagnosis of MSA-C. The patient was a known hypertensive for 5 years, on Amlodipine 5 mg twice daily. Hemogram, biochemistry and electrocardiogram (ECG) were within normal limits.

The patient weighed 80 kg, had an inter-incisor distance of 4 cm, presented with severe neck rigidity and ante flexion as shown in Figure 1a. The patient was monitored inside the MRI suite with ECG, noninvasive blood pressure, pulse oximeter and capnography using MRI compatible monitor (Magnitude TM 3150M MRI Monitor, In vivo, Orlando, FL). The anesthetic plan was to provide sedation and analgesia to reduce neck flexion. The patient was given intravenous midazolam 2 mg, and then supplemented with fentanyl 80 mcg and propofol 80 mg, but the neck remained ante flexed, so an additional dose of 1 mg midazolam, fentanyl 40 mcg and propofol 80 mg was repeated. Following this, the patient was deeply sedated but with the neck still ante flexed. A total dose of 160 mg propofol, 3 mg midazolam and 120 mcg of fentanyl had been used. The patient showed features of airway obstruction, but there was no desaturation, so a classic laryngeal mask airway (LMA) size 4 was immediately placed to protect the airway. The patient was connected to a ventilator with oxygen, nitrous oxide and 1% sevoflurane and allowed to breathe spontaneously. Despite conversion to general anesthesia, the fixed flexion of the neck persisted and the regular head coil could not be used. In the discussion with the radiologist, it was decided to use a Phase Array Torso sensor for the MRI [Figure 1b] which allowed the patient’s entry into the gantry. The patient breathed spontaneously for the rest of the procedure, remained hemodynamically stable and recovered well. General anesthesia with neuromuscular blockade could have facilitated entry of patient into the MRI scanner, but this was not explored in our case.

There is little literature available regarding airway management of patients with MSA or in patients with severe neck rigidity presenting for imaging studies. In comparison to Parkinson’s disease disproportionate antecollis is more commonly seen with MSA, but it occurs late in the course of the disease.[2] Boesch et al.[3] studied the clinical and radiological images in 10 patients with MSA, and attributed the cause for antecollis to neuronal loss in the ventral putamen.

The classic LMA has been used successfully for maintaining airway during MRI.[4] In our patient, the severe neck dystonia did not permit the use of the head coil which we overcame by using the Phase Array Torso (Philip’s Achieva 3.0 Tesla, 2007, The Netherlands) coil which gave good quality images comparable to the regularly used head coil[5] (Figure 1c).

Our experience suggests that positioning the MSA patient in the gantry with neck dystonia may be difficult and may be associated with airway obstruction with deep levels of sedation. Thus general anesthesia with LMA placement should be the first line of anesthetic management in patients with MSA and neck dystonia.

Figure 1: (a) Patient unable to lie supine due to severe neck ante flexion, arrows depicting the level of occiput above the level of table. (b) Classic laryngeal mask airway in situ and phase array torso sensors placed over the patients’ head in place of the regular coil to allow entry inside the magnetic resonance imaging gantry. (c) The “Hot Cross Bun Sign” seen in our patient
Sir,

A 13-year-old boy weighing 27 kg diagnosed to have hypersplenism was advised splenectomy with splenorenal shunt. General anesthesia was administered with a cuffed endotracheal tube ID 6 mm using a ventilator, circle absorber and standard gas flows. A nasogastric tube 12F was inserted through left nostril and fixed at 45 cm mark after confirming the position by auscultation. Intraoperatively, when the surgeon requested for continuous gastric decompression, ventilator bellows deflated and patient was not getting ventilated. Ventilation was taken over manually. Ventilator showed negative pressure in breathing system. Immediately a semi-closed circuit was connected to the patient, and 100% oxygen was given but the patient could not be ventilated with the ventilator. Suspecting some malfunction in the anesthesia machine, another anesthesia workstation was attached to the patient. However, it did not help. Meanwhile, suction of nasogastric tube was stopped, and it was possible to ventilate using ventilator of workstation. Later on again when surgeons asked for gastric decompression, the problem recurred. We therefore suspected that the cause of the problem was a tracheal position of the nasogastric tube. A hissing sound was heard at every breath from the ventilator at the NG tube tip. This was confirmed by connecting it to a capnograph which showed an end-tidal carbon dioxide waveform. Nasogastric tube was repositioned in esophagus. Surgery continued for 5 h uneventfully. The later period was uneventful.

Although nasogastric tube insertion is simple and a routine practice, inadvertent entry to trachea can cause serious complications. The tube may enter the trachea because of the proximity of the larynx to the esophagus.[1] This may also cause pneumothorax.[2] The tube may coil up in the patient’s throat, particularly if the patient retches. Several complications like laryngospasm have been attributed to its misplacement under anesthesia.[3]

Auscultation of the epigastric region after insufflation of air through the tube (the “whoosh” test) is usually done. The confirmation of the correct position must be confirmed as per suggested guidelines.[4]

Misplacement of a nasogastric tube in the trachea, leading to possible life-threatening disaster like scenario should be borne in mind. Many hospitals have developed checklists to avoid complications related to nasogastric tube. Any complications that do occur should be reported on a critical incident form. Tube position should be checked after coughing or vomiting. Capnography or colorimetric capnometry for identification of feeding tube placement in mechanically ventilated adult patients is recommended.[5] Its correct intragastric position can be verified by capnography, checking the aspirate for acidic pH of 5.5 or below,[3] and by an X-ray if possible. In our case, there was no deflation of bellows with the standard amount of set gas flows. Hence, there was no obvious leak detected. Accidental displacement of a nasogastric tube into the trachea that was connected to continuous suction caused the ventilator bellows to deflate and “malfunction” of ventilator. Other possible causes of deflation of bellows could be the fault in the anesthesia machine, leaks in circuit and vaporizer.