Sudden sustained asystole during a cerebellopontine angle surgery

Sir,

Cerebellopontine angle (CPA) surgeries are encountered with numerous potentially life-threatening cardiovascular complications. Cardiovascular complications are usually in the form of arrhythmias with hypertension or hypotension. Asystole without any alerting signs is a very rare presentation during these surgeries. We report a rare presentation of sudden sustained asystole without preceding bradycardia during excision of a tumor in the CPA.

A 50-year-old lady, well-controlled hypertensive, was posted for surgical excision of acoustic schwannoma at right CPA. General endotracheal anesthesia with standard monitors including central venous (CV) (right subclavian vein) and intra-arterial (right dorsalis pedis artery) blood pressure monitoring was induced intravenously with fentanyl 200 µg, propofol 150 mg, vecuronium 8 mg, and maintained with morphine 8 mg intravenous, isoflurane 1.0-2.0% in 50% air and oxygen with controlled ventilation. In left lateral position, the tumor was removed with blood loss ≈ 500 ml with no cardiorespiratory events. When the surgeon was removing the last part of the tumor which was close to the brainstem, a sudden drop in heart rate from 72 to 0 beats per minute (bpm) was noticed with flattening of electrocardiogram (ECG), invasive blood pressure, plethysmogram, and capnography waves (pattern of ETCO$_2$ fall: 35 → 10 → 5 → 0 mmHg within 20 s). Immediately the surgical team was informed and manipulations were stopped. Atropine (1.2 mg, intravenous) bolus was administered. Surgical area was flushed with saline, inspiratory oxygen concentration was increased to 100%, and patient’s head was lowered below the level of heart. Blood was aspirated from the CV catheter which did not show any air bubbles. When asystole persisted for 40 seconds with above measures, adrenaline (1 mg, intravenous) bolus was administered. Within 5 seconds, sinus rhythm was seen with overshooting of the heart rate to 180 bpm and blood pressure to 196/110 mm Hg with ETCO$_2$ of 60 mm Hg. Within 5 min the heart rate and blood pressure were brought down to 100 bpm and 144/90 mm Hg, respectively with esmolol (30 mg, intravenous) bolus and ETCO$_2$ also became normal (35-40 mm Hg). Arterial blood gas analysis done was within normal limit. Surgery was restarted once patient was hemodynamically stable. Surgery was completed uneventfully without recurrence of such episodes with gentle surgical handling. Trachea was extubated after adequately reversing the neuromuscular blockade. Patient was monitored in intensive care unit (ICU) for 24 h which was uneventful.

The probable causes for the event may have been a massive venous air embolism (VAE) or an intense trigeminocardiac reflex (TCR).

We could not retrieve air bubbles from CV catheter. Although aspiration of air from the CV catheter confirms air embolism, the absence of air in aspirate does not rule it out.

TCR is a well-understood brainstem reflex triggered by electrical, mechanical or chemical stimulation of the trigeminal nerve pathways and characterized by abrupt onset of arrhythmias usually sinus bradycardia terminating in asystole, rarely asystole with no preceding bradycardia, hypotension, apnea, and gastric hypermotility. In our patient, sudden asystole developed without preceding bradycardia when the surgeon was manipulating near the brainstem. Asystole persisted for ≈ 40 seconds in spite of administration of anticholinergic drugs but responded to adrenaline and did not require chest compressions.

Although the clinical presentation in our patient resembled TCR, VAE could not be ruled out completely.

The preparation of clinicians to foresee, prevent, recognize, and manage any clinical event is possible only when they know about the possibility of such an event. So this report alerts the clinicians about possibility of a sudden sustained asystole without warning signs and also persuades them to be better prepared to handle such episodes.

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The neural integrity monitor electromyogram tracheal tube: Anesthetic considerations

Sir,

The neural integrity monitor (NIM) electromyogram (EMG) tracheal tube is frequently utilized for head and neck procedures when laryngeal nerves (LNs) could be injured during the process of surgical dissection. It is particularly useful for identifying the recurrent LN.

The anesthesiologist should be familiar with the proper use and functioning of this device. Initially, this unique tracheal tube must be positioned so that its color-coded contact band is appropriately placed between the vocal cords.

When attempting to identify LNs, a stimulating electrical current of 0.5-2.0 mA is used by the surgeon. This current is administered via a sterile probe, which is placed directly on the anatomical site in question. Additionally, return electrodes are positioned in the skin above the sternum. When a LN is located, an electrical signal is subsequently generated by the motion of the vocal cords. An audibly recognizable “machine gun click” is then produced from the device's associated monitor. This sound has a set frequency of 4 times/s (4 Hz). Simultaneously, an oscilloscope-like screen displays an identifiable sinusoidal response.

Depending on clinical conditions, either direct laryngoscopy, video laryngoscopy, or fiber-optic intubation can be utilized for airway management. However, tracheal intubation in many of these patients may be difficult; given their concomitant head and neck disease. Thus, the glottis may not be midline or the trachea may be compressed. The presence of head and neck tumors, or prior radiation treatment, could also produce limited neck extension. Inadequate subluxation of the mandible, obesity, or reduced thyro-mental distance may also be present. Accordingly, the anesthesiologist may wish to use fiber-optic intubation. It should be noted that the use of certain associated techniques, such as nebulized or trans-tracheal lidocaine, or superior LN blocks, may interfere with the performance of this tracheal tube with respect to the surgical localization of the LNs.

As these tracheal tubes have a minimum outer diameter of at least 8.8 mm, oral intubation is necessary. Furthermore, the conical connector, located on the proximal aspect of this tracheal tube, is non-removable. For these reasons, the use of the Patil-Syracuse fiber-optic-compatible oral airway (FCOA) may be advantageous. As shown in Figure 1, this FCOA is mechanically compatible with the NIM EMG tracheal tube. It also has an anterior channel which greatly facilitates intubations which may be difficult secondary to an anterior-oriented glottis. Moreover, this channel is...