



Unanticipated expanding neck mass under general anesthesia

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To the Editor,

We report a case of a healthy 26-yr-old male who presented for fixation of an ankle fracture and developed an unanticipated expanding neck mass while under anesthesia. The patient has provided consent for publication of this report.

Following placement of standard monitors and denitrogenation, anesthesia was induced with intravenous midazolam, remifentanyl, and propofol. A size-5 LMA-Classic™ (LMA, San Diego, CA, USA) was successfully placed with a good seal and no leak into an otherwise unremarkable airway. Maintenance of anesthesia and spontaneous ventilation was achieved with sevoflurane (end-tidal concentration 2-3%). Following surgical incision, the administration of additional fentanyl (50 µg *iv*) resulted in apnea. When positive pressure ventilation was instituted, a significant leak was observed even though the airway pressure did not exceed 20 cm H₂O. Additional inflation of the LMA cuff did not resolve the leak. There was no audible stridor, the patient's chest was clear to auscultation, and both ventilation and oxygenation remained satisfactory.

When spontaneous respiration gradually returned, a soft-tissue mass became visible over the right clavicle and extended into the supraclavicular fossa and anterior triangle of the neck (Figure). On examination, the mass

was soft, compressible, and did not have a well-circumscribed border. There was no subcutaneous emphysema. The mass expanded quickly over several minutes resulting in leftward deviation of the trachea. Breath sounds were present bilaterally with a slight reduction on the right. Bronchoscopic examination performed through the LMA showed a trachea which appeared normal with no evidence of external compression or narrowing. Following completion of the surgery, a portable chest *x-ray* was performed and revealed a left-deviated trachea with a slight narrowing below the glottis. There was no evidence of a pneumothorax.

While still under anesthesia, the patient's airway was secured with an endotracheal tube (ETT), and a postoperative computed tomography scan was performed on his head and neck. The scan revealed a cavernous hemangioma involving the sternocleidomastoid muscle with extension to the subcutaneous fat overlying the ipsilateral clavicle. There was no direct airway involvement. The patient was subsequently taken to the postanesthesia care unit for observation where the mass gradually regressed and the patient underwent an uneventful tracheal extubation. The patient was admitted to the hospital overnight for observation.

Vascular malformations, including hemangiomas, have a prevalence of 1.2-1.5% in the general population.¹ Venous malformation is the most common type of vascular malformation. The malformations can occur within any tissue type. They are present at birth, grow commensurately with a child, and are most commonly present and expand during adolescence.² They are typically compressible and non-pulsatile. In one review of intramuscular venous malformations, the authors noted distention with dependent positioning, exertion, and spontaneous intermittent distention.³

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Figure Expanding soft tissue mass observed in the patient's right supraclavicular fossa during general anesthesia

The non-pulsatile subcutaneous nature of our patient's vascular lesion was in keeping with a low-flow vascular malformation that enlarged while under general anesthesia. Possible reasons for this unanticipated expanding mass include vasodilatory properties of the general anesthetic,

compression of the outflow vasculature of the malformation due to compression of the pharyngeal wall by the LMA, and increased intrathoracic pressure from a brief period of positive pressure ventilation.

Possible intraoperative management for an expanding venous vascular malformation includes a reverse Trendelenburg position and avoidance of positive pressure ventilation. While there is little clinical evidence to support any perioperative management of patients with a vascular malformation, our experience suggests that the safest course of action for patients with a known vascular malformation in the vicinity of the airway may be to secure the airway with an ETT if they are having a surgical procedure under general anesthesia.

Conflicts of interest None declared.

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