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CASE REPORT

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Case of laryngeal venous malformations requiring repeated advanced airway management in the perioperative course

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Abstract

Laryngeal venous malformations rarely but do cause airway obstruction resulting in life-threatening events. The perioperative airway management for the patients with them has not been well established. We suggest a strategy for laryngeal venous malformations management in the patients who undergo surgery in addition to planning for airway management.

KEYWORDS

awake tracheal intubation, difficult airway management, laryngeal venous malformation

1 | INTRODUCTION

Laryngeal venous malformations are the most common slow-flow vascular malformations in the head and neck region. Laryngeal venous malformation in the upper airway rarely but does cause airway obstruction or bleeding resulting in life-threatening events,[1,2] hence requires a prompt diagnosis and treatment. Therapeutic strategy for venous malformations includes sclerotherapy, surgery, or embolism, and the choice of strategy depends on the stage and type of the lesions; however, specific criteria for treating laryngeal venous malformations have not been well established.[3–5] We herein report a perioperative case that required repeated airway management due to laryngeal venous malformations.

2 | CASE HISTORY

A 64-year-old man, who had a stable clinical course of laryngeal venous malformations, underwent awake tracheal intubation under a bronchoscopy guide for safety concerns over difficult airway to receive cervical laminoplasty for the cervical disc herniation. The intraoperative bronchoscopic examination found that two venous malformations existed in the lower pharynx as if they sandwiched the left part of the arytenoid cartilage, while the airway was sufficiently patent (Figure 1). The intubation procedure was completed smoothly and successfully without any complications. The surgical operation and anesthetic management under total intravenous anesthesia with propofol and remifentanil were all completed uneventfully. The surgery and anesthesia times were 1 h 40 min and 4 h 20 min, respectively. Total blood loss amount and urine output during the operation were 30 g and 320 ml, respectively. The total amount of intraoperative fluid transfusion was 1050 ml without any blood transfusion. Soon after extubation; however, the patient demonstrated obvious stridor on the operating table. The emergency bronchoscopy found the swollen venous malformations that were enlarged compared to the pre-operative examination and nearly obstructing the glottis (Figure 2). Accordingly, the anesthesiologist immediately reintubated him with an awake tracheal intubation procedure with a fiberscope, which was smoothly performed. He was then admitted to the intensive care unit (ICU) for postoperative care.

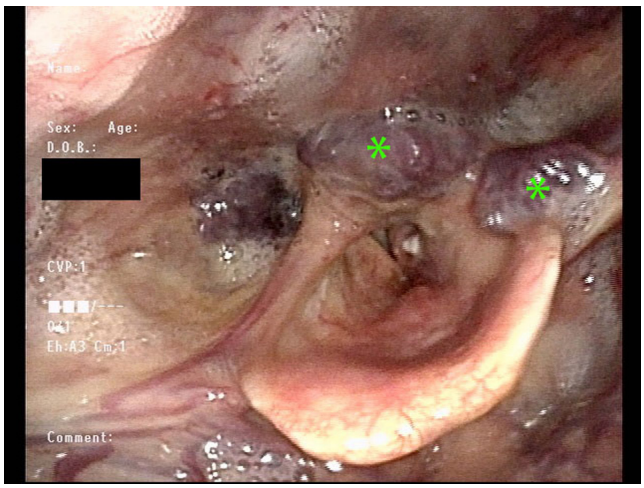

FIGURE 1 Glottic view obtained before the operation with bronchoscopy. Two venous malformations were detected beside the arytenoid.

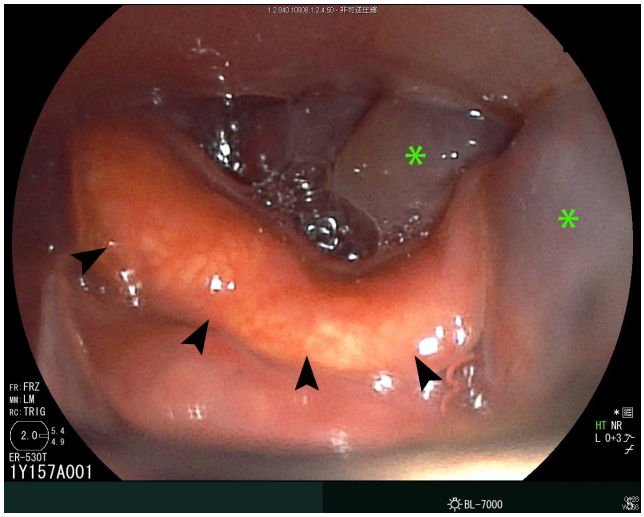

FIGURE 2 Glottic view obtained upon extubation in the operation room. The laryngeal edema is apparent, and the two malformations are prominently swollen. Arrowhead, epiglottis.

In the perioperative management, the patient received close examinations by otolaryngologists in the ICU. On the postoperative Day 1, the patient was extubated after confirming the swollen but smaller venous malformations with sufficient space in the airway by laryngoscope examinations. He developed no respiratory symptoms such as stridor or hoarseness after the extubation, and then received hydrocortisone 100 mg q 8 h as prophylaxis for laryngeal edema. The clinical course was stable and uneventful during the day of extubation.

On the morning of postoperative Day 2, however, when he sat up with a help of two nurses for rehabilitation in the ICU, he had suddenly shown the sign of suffocation and lost his consciousness with a sharp decrease in the oxygen saturation (SpO_2) below 80%. The patient was immediately reintubated with a channeled video laryngoscope where re-swollen venous malformations were seen. The patient fully recovered his consciousness after reintubation without any abnormalities in the following head computed tomography, suggesting his loss of consciousness was due to transient suffocation by the venous malformations. The tracheostomy was placed on the postoperative Day 5 and then transferred to another hospital to receive sclerotherapy for the venous malformations.

3 | DISCUSSION

This case report described the unstable nature of laryngeal venous malformations which caused airway blockage in the postoperative period. Despite repeated and careful laryngoscope examinations of the laryngeal venous malformations, we could not avoid the suffocation event after the cervical surgery. Several factors might have been associated with the worsening edema of the laryngeal venous malformations; the surgical intervention to the neck region itself; repeated endotracheal intubation procedures that caused mechanical contact between the endotracheal tube and venous malformations; changes in intrathoracic pressure caused by mechanical ventilation that would affect blood pressure and venous return; and the unusual fluid balance due to perioperative fluid therapy.

Clinical guidelines for the treatment of laryngeal venous malformations are not currently available, hence a preoperative assessment of risk of difficult airway by specialists involving otolaryngologists, orthopedics, anesthesiologists, and intensivists, is as important as close perioperative monitoring in perioperative management. In retrospect, preoperative interventions to the laryngeal venous malformations including sclerotherapy or prophylactic tracheostomy might have been a strategic option for this patient in order to secure the airway during the perioperative management of the cervical operation under general anesthesia.

Importantly, this case report also depicted the usefulness and safety of procedures in emergent difficult airway management in the ICU.[6] Urgent tracheal intubation in the ICU is frequently performed with rapid sequence induction, which is associated with severe complications such as cardiovascular instability, severe hypoxia, and cardiac arrest at worst.[7] In this case, awake tracheostomy could be a meaningful option because bleeding of venous malformation could be a critical risk factor of airway management.[8] In this regard, awake intubation with a video device such as a bronchoscopy or video laryngoscope or awake tracheostomy has certain merits and can be safely accomplished even in an emergency,[8–10] although some training and experience are required for developing the

skills. In this case, the awake intubation with a channeled video laryngoscope while maintaining spontaneous breathing was done without any complications. From a patient-safety viewpoint, acquisition of awake intubation skills would be an important skill for all the physicians working in emergency and perioperative care settings.

4 | CONCLUSION

In this case report, there are three points from this case. Firstly, laryngeal venous malformations can be a risk factor of airway obstruction in perioperative management. Secondly, the interdisciplinary assessment and discussion of the patients is important especially for the head and neck surgery. Finally, the awake tracheal intubation can be a helpful skill for such a critical care situation.

AUTHOR CONTRIBUTIONS

Fumi Maruyama: Conceptualization; writing – original draft. **Takahiro Masuda:** Writing – original draft; writing – review and editing. **Nobuyuki Nosaka:** Writing – original draft; writing – review and editing. **Kenji Wakabayashi:** Supervision; writing – review and editing.

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None.

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

DATA AVAILABILITY STATEMENT

All data supporting this study's findings are available from the corresponding author upon reasonable request.

CONSENT

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

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