



Anaesthetic Management of Facial Arteriovenous Malformation for Endovascular Embolisation: A Case Report

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ABSTRACT:

Background: Facial arteriovenous malformations (AVMs) are rare vascular anomalies that can significantly complicate airway management due to anatomical distortion, risk of bleeding, and restricted airway access.

Case Summary: We describe the anaesthetic management of a 33-year-old woman with a large facial AVM scheduled for endovascular embolization under general anaesthesia. Despite anticipated airway difficulty, successful oral intubation was achieved using video laryngoscopy. The case highlights the importance of individualized planning and multidisciplinary coordination.

Conclusion: In selected cases of facial AVMs where intraoral structures are spared, video laryngoscopy can be a safe and effective first-line airway management strategy.

INTRODUCTION

Arteriovenous malformations (AVMs) are congenital high-flow vascular anomalies characterised by direct connections between arteries and veins without intervening capillary beds. Facial AVMs, while uncommon, can present with swelling, disfigurement, and spontaneous bleeding. Their proximity to airway structures presents a significant challenge during anaesthesia, especially in procedures like embolization. The risk of difficult mask ventilation, intubation, and potential for severe bleeding necessitates individualized airway planning. While awake fiberoptic intubation is often recommended, video laryngoscopy (VL) has emerged as an effective alternative in selected patients [1,2]. We present a case of a patient with a large facial AVM undergoing endovascular embolization, managed successfully using video laryngoscope-guided intubation under general anaesthesia.

CASE PRESENTATION

Patient Information

A 33-year-old female weighing 53 kg presented with a progressively enlarging swelling over the right side of the face for 25 years, associated with facial asymmetry. There was no history of airway obstruction, dysphagia, or dyspnoea. She had no significant past medical history. She underwent total abdominal hysterectomy under

spinal and epidural anaesthesia 5 years ago. Vital signs were stable and systemic examination was normal.

Airway Examination and Diagnostic Assessment

The mouth opening was approximately 3.5 cm. She had class III Mallampati grading and class I upper lip bite test. The thyromental distance was 5.5 cm. She had restricted neck extension, due to pain. There was no nasal or intraoral involvement of the lesion. CT angiogram neck and intracranial vessels confirmed a large ill-defined AVM with multiple serpiginous tortuous vessels in right side of face and peri cranial soft tissue region of right temporal and parietal region. Intracranial extra axial extension was noted with no parenchymal involvement.



Figure 1: Patient with facial AVM with peri cranial soft tissue involvement



Figure 2: CT Angiogram at mandibular level

Therapeutic Intervention

Endovascular embolization was planned for this patient as the initial step of management of AVM. Anatomical distortion and reduced mouth opening indicated a potentially difficult airway. However, since the oropharynx and glottic structures were not involved, the airway was deemed manageable under general anaesthesia with video laryngoscopy.

The patient was counselled on the day prior to the procedure. Written informed high risk consent was obtained from the patient, including the risk of possible surgical airway. Difficult airway cart with different sizes of endotracheal tubes (ETTs), nasal and oral airways, supraglottic airway devices, video laryngoscope and fiberoptic bronchoscope was kept prepared.

Patient was shifted to the operating room. All ASA standard monitors were attached. Two wide bore (18 G) IV access were secured. Blood was crossmatched and available. Patient was preoxygenated with 100% oxygen for 5 minutes. The patient was induced with Inj. Fentanyl 100 mcg IV and Inj. Propofol 80 mg IV. Check ventilation was done and positive mask ventilation confirmed. Inj. Succinyl Choline 100 mg was administered, and video laryngoscopy was attempted after 45 seconds.

C-MAC Video Laryngoscope was used with D blade. Cormack -Lehane Grade I view was obtained. A 7 MM cuffed ETT was inserted without trauma or bleeding. After confirming the position of the ETT using capnography and auscultation, the ETT was fixed at 20 cm. Inj. Vecuronium 4 mg was given. Anaesthesia was maintained with Oxygen-air mixture and Sevoflurane. IV fluids and hemodynamic monitoring was continued. The

intraoperative course was stable with no airway or bleeding complications.

Patient was reversed with Inj. Neostigmine 2.5 mg and Inj. Glycopyrrolate 0.4 mg. Patient was extubated once fully awake and responsive with airway reflexes intact. There was no bleeding, airway edema or respiratory distress in the immediate postoperative period. After an uneventful period in the PACU, she was shifted to the ward without complications.

DISCUSSION

Facial AVMs pose considerable anaesthetic risks, particularly during airway management. The vascularity and anatomical distortion of the lesion increase the risk of difficult intubation and catastrophic bleeding. The classical approach for anticipated difficult airway in such scenarios is awake fiberoptic intubation, which minimizes the risk of trauma and maintains spontaneous ventilation^[1,3]. However, awake techniques may be limited by patient anxiety, cooperation, or technical feasibility, particularly when intraoral anatomy is preserved and external access is possible.

In this case, despite external facial distortion and reduced mouth opening, the oropharynx was unaffected. Video laryngoscopy was chosen as the primary approach due to several benefits:

- Enhanced glottic visualization without requiring alignment of airway axes^[2]
- Gentle blade insertion reduces tissue trauma and bleeding risk
- Useful in patients with limited mouth opening or distorted facial anatomy
- Higher success rate in difficult airways compared to direct laryngoscopy^[4]

The patient's anxiety, absence of airway obstruction, and adequate oropharyngeal space made an awake technique unnecessary. Induction was carefully titrated to ensure the ability to ventilate before committing to neuromuscular blockade. The Video Laryngoscopy approach provided an excellent view and allowed for atraumatic intubation on the first attempt.

The literature supports video laryngoscopy as an effective strategy in difficult airways. Aziz *et al.* reported higher first-pass success and fewer complications with Video Laryngoscopy in difficult intubation scenarios^[2]. While awake fiberoptic intubation remains the standard for certain lesions—especially those involving intraoral or supraglottic areas—this case exemplifies that video laryngoscopy is a valid and safe alternative in well-selected patients.



Preparation for failed intubation is essential in AVM cases. Bleeding during airway attempts can flood the oropharynx and obscure vision. Backup strategies, including fibreoptic equipment, supraglottic airways, and surgical airway access, must be readily available. Similar cases in the literature have reported massive bleeding from intraoral AVMs during conventional laryngoscopy or LMA insertion, necessitating emergency surgical airway^[3].

CONCLUSION

Facial AVMs present a significant challenge to airway management due to potential bleeding, distorted anatomy, and restricted access. In patients where intraoral structures are preserved, video laryngoscopy may offer a safe and effective method for securing the airway under general anaesthesia. A careful preoperative assessment, strategic planning, and availability of backup airway options are essential to achieving a successful outcome.

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