

## Case Report

# Successful anesthetic management of a 17-year-old patient with facial arterio-venous undergoing sclerotherapy: a case report

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### ABSTRACT

Arterio-venous malformations (AVM) are abnormal collection of blood vessels. They are rare congenital vascular malformations that account for 1.5% of all vascular abnormalities while 50% of such cases occur in the oral and maxillofacial region. Facial AVM are uncommon. Patients presenting with AVMs require a complete investigation using precise clinical examination and advanced imaging modalities. The treatment of a patient with AVM includes a multi-step process. In this case, we report a case of extensive AVM in the face of a 17-year-old female patient. The report primarily focuses on the successful anesthetic management for sclerotherapy along with insights on clinical characteristics and imaging manifestations. To the best of our knowledge, this is one of the few cases to be reported in India.

**Keywords:** Anesthetic management, Arteriovenous malformation, Difficult airway

### INTRODUCTION

Vascular anomaly is based on a variety of vascular pathology such as vascular malformations and proliferating vascular tumors. The treatment of vascular anomalies is often multifactorial which may include interventional radiology approaches such as sclerotherapy, embolic therapy, and laser coagulation. These procedures play a key role in the management of vascular anomalies.<sup>1</sup> Arteriovenous malformations (AVMs) are unusual congenital lesions that can occur anywhere in the body. AVMs can be life-threatening due to the potential of massive hemorrhage.<sup>2</sup> AVMs are an uncommon congenital vascular malformations. As per current evidence, AVMs account for 1.5% of all vascular abnormalities while 50% of such cases occur in the oral and maxillofacial region.<sup>2</sup> In this paper, we describe a

rare case of extensive arteriovenous malformation in the face of a 17 yr. old female patient, its clinical characteristics and imaging manifestations as well as the satisfactory anesthetic management for sclerotherapy.

### CASE REPORT

A 17-year-old patient reported to our center with swelling on her left cheek. The patient reported to have progressive swelling since her childhood. The patient had no history of tobacco smoking, alcohol, or any known substance abuse. Managing patients undergoing sclerotherapy with AVM is an anesthetic challenge. We report a successful anesthetic management of a patient with AVM in our center. The lesion had spread into the oropharynx involving the left buccal mucosa and the left lateral border of the tongue. The patient had complained

of intermittent and throbbing pain. A change in voice was also observed. The patient suffered from a skin plethora at the left cheek that extended up to the neck. The patient was advised a magnetic resonance imaging (MRI) neck angiography. A large multiloculated cystic lesion with internal septations arising from and involving the left maxillofacial region was observed. Internal phlebolith within the lesion was also observed (Figure 1).



**Figure 1: MRI Image of lesion.**

The lesion extended up to the left temporal and infra-temporal and the left nasopharyngeal lesion. It revealed a large multiloculated cystic lesion with internal septations arising from and involving left maxillofacial region showing internal phlebolith within the lesion. The lesion extended to several areas of the oro-facial region such as the left retromolar trigone, left lateral tongue border, left tonsilolingual sulcus, left lateral pharyngeal mucosal

space, pre and para epiglottic region. Intraluminal narrowing was observed due to oropharyngeal extension. The anterior extension reached the left lower lip, submental space, submandibular space, and masticator space.

The MRI was suggestive of venous malformation due to lack of any arterial or venous feeder on MRI imaging. The patient’s routine laboratory investigations were within normal limits. An informed consent was taken from the patient. The patient was explained about fiberoptic intubation under mild sedation considering her airway was difficult to manage otherwise.

The patient was kept nil-by-mouth (NBM) for six hours as per standard protocol. The patient was administered Ringer’s lactate via a large bore intravenous access secured with an 18G Venflon on right hand. The patient’s weight was 40 kilo grams (Kg) and height 150 cm. The patient was pre-medicated with glycopyrolate 0.2mg and intravenous ondansetron. The patient was nebulized with budesonide and topical lignocaine (4%). The patient was given oxygen via Hudson’s mask. The Routine laboratory investigations were within normal limits. Since she was 17 years, we explained and took informed consent for the procedure of fibreoptic intubation under mild sedation as her airway was most difficult to manage otherwise. Patient was kept 6 hours NBM as per standard protocol and large bore intravenous access secured with 18G veinflon on right hand and Ringers lactate started. The patient’s oxygen saturation (SpO2) levels were recorded at 98% (Table 1). The operating team was prepared for difficult intubation. A difficult intubation, trolley, multipara monitor, and defibrillator with all necessary resuscitation equipment was evaluated and kept at stand-by. The lesion made it difficult for the team to hold the mask or insert supraglottic airway devices. Tracheostomy tray and cricithyrotomy equipment were kept at stand by.

**Table 1: Vital parameters.**

Time min from induction	Pulse /min	BP mm/Hg	SPO2 %	ETCO2	BIS
0	106	116/70	94	-	97
5	108	118/66	94	-	90
10	104	122/80	96	36	85
15	100	126/80	98	34	60
20	96	124/90	98	32	56
25	98	128/66	100	38	55
30	90	104/60	100	36	53
40	94	108/66	100	34	58
50	92	114/72	100	36	56
60	90	118/70	100	34	59
75	96	118/68	100	38	70
90	94	126/84	100	36	85
100	98	122/84	100	35	90
120	90	116/68	100	37	94

The patient was sedated with 1 mg midazolam and 15 mg ketamine. A flexible fiber optic bronchoscope was inserted. The patient was intubated with 6 no. flexometallic disposable tube. The patient was induced with 50 mg propofol and 20 mg xylocard after End-Tidal Carbon Dioxide (ETCO<sub>2</sub>) confirmation. The patient was maintained with pressure control ventilation (PCV) using O<sub>2</sub>+N<sub>2</sub>O (50:50) low flow technique (0.4+0.4 L/min). PCV was maintained using the Drager Fabius Plus anesthesia workstation. BIS monitoring was maintained between 50 to 60 using Sevoflurane 2% and propofol 0.5 to 0.8 mg/kg/hr with fentanyl 0.5 microgram/kg/hr. Muscle relaxants were not used. All vital parameters such as heart rate (HR), blood pressure (BP), ETCO<sub>2</sub>, temperature, Electrocardiography (ECG), BIS, and anesthesia gas were closely monitored (Table 2). The patient underwent sclerotherapy under fluoroscopic guidance by percutaneous method. The vascular malformation was puncture percutaneous using 22 G scalp vein. The contrast agent, omnipaque (5 ml) was injected to visualize the radio-image of the lesion and needle confirmation within the lesion.

**Table 2: Pulse, blood pressure, and diastolic blood pressure charting.**

Time (min)	Pulse/min	SBP mm/Hg	DBP mm/Hg
0	106	116	70
5	108	118	66
10	104	122	80
15	100	126	80
20	96	124	90
25	98	128	66
30	90	104	60
40	94	108	66
50	92	114	72
60	90	118	70
75	96	118	68
90	94	126	84
100	98	122	84
120	90	116	68

**Table 3: Post-op ICU parameters.**

Time post op in hrs	Pulse	Spo2	SBP	DBP	ETCO <sub>2</sub>	Time post op in hrs	Pulse
1	90	98	114	56	36	1	90
2	86	98	106	70	35	2	86
3	82	99	108	66	36	3	82
4	84	97	114	60	34	4	84
5	82	98	108	62	35	5	82
6	80	99	112	78	37	6	80

**Table 4: Extubation-Day 3 ICU Monitoring.**

Time (min)	Pulse	SBP	DBP	SPO2	ETCO <sub>2</sub>
0	98	104	60	99	38
30	96	108	56	99	36
60	94	114	66	99	35
120	90	118	70	99	40
180	92	116	68	99	42
240	96	104	68	99	40

The blood aspirated confirmed it to be low flow venous malformation and not a lymphangiomatous lesion. Sterol, 3% sodium tetradecyl sulfate (STS) 10 ml was injected at multiple sites. The overall procedure was uneventful. Nitrous oxide and sevoflurane were discontinued. The patient had good reflexes and was shifted to the intensive care unit on T-piece. The patient's vitals were within normal limits (Table 3). As per the radiologist's opinion and in view of post-sclerotherapy edema and airway compromise, the patient was extubated on the second day post-operatively (Table 4). The patient was discharged on

the fifth day post-operative after an uneventful extubation. The patient is on regular follow-up.

## DISCUSSION

The diagnosis and treatment of vascular anomalies is based on specific terminology and classification. The classification of vascular anomalies is based on the International Society for the Study of Vascular Anomalies (ISSVA) which is a globally accepted system. As per the ISSVA, there are two types of vascular anomalies, i.e. (a) Vascular malformations and (b) Vasoproliferative or vascular neoplasms such as hemangioma.<sup>3</sup> Vascular malformations are a group of lesions associated with disorders of the vascular development. They remain a diagnostic and treatment challenge to healthcare practitioners.<sup>4</sup> The diagnosis in such cases is crucial for the development of optimal treatment. The optimal treatment and management often requires an organized and multidisciplinary approach with diagnostic imaging playing a vital role. The combination of a combined radiological and surgical treatment has been associated with promising results.<sup>5</sup>

The presence of oral or oro-naso-pharyngeal venous malformations presents a difficult case for airway management for highly skilled and experienced anesthesiologist. An extensive and comprehensive planning is required in conjunction to securing the airway by avoiding any complications. In such complex cases, cannot intubate cannot ventilate (CIC) is a common concern.<sup>4,5</sup>

The use of new treatment modalities such as fiber-optic intubation instead of conventional tracheostomy helps in reducing morbidity.<sup>6,7</sup> Limiting the use of anesthetic agent for an uneventful post-operative recovery is an ideal approach.

Vigilance after extubation in order to prevent airway related complications is an effective approach during the perioperative period. STS is an excellent option for interventional radiologist as it offers a simple and effective treatment modality in regressing huge malformations.<sup>8,9</sup>

Successful management of patient with AVM has been reported in the literature.<sup>10,11</sup> This case forms the basis for further research and exploration in the anesthetic management of patients with AVM.

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#### REFERENCES

1. Mulligan PR, Prajapati HJ, Martin LG, Patel TH. Vascular anomalies: classification, imaging characteristics and implications for interventional radiology treatment approaches. *Brit J Radiol.* 2014;87(1035):20130392.
2. Kumar A, Mittal M, Srivastava D, Jaetli V, Chaudhary S. Arteriovenous malformation of face. *Contemp Clin Dent.* 2017;8(3):482-4.
3. Cox JA, Bartlett E, Lee EI. Vascular malformations: a review. *Seminars Plastic Surg.* 2014;28(2):58-63.
4. Carqueja IM, Sousa J, Mansilha A. Vascular malformations: classification, diagnosis and treatment. *Int Angiol.* 2018 Apr;37(2):127-142.
5. Noshier JL, Murillo PG, Liszewski M, Gendel V, Gribbin CE. Vascular anomalies: a pictorial review of nomenclature, diagnosis and treatment. *World J Radiol.* 2014;6(9):677-92.
6. Neeta S, Rao R, Upadya M, Keerthi P. Arteriovenous malformation of face: a challenge to anesthesiologists. *Anesth Essays Res.* 2017;11(3):784-6.
7. Jain A, Panda NB, Kumar P. Induction of anesthesia in a case of impossible mask ventilation. *Anesth Essays Res.* 2010;4(1):46-8.
8. Vascular malformations: approach by an interventional radiologist. *Semin Plast Surg.* 2014;28(2):91-103.
9. Alakailly X, Kummoona R, Quereshy FA, Baur DA, González AE. The use of sodium tetradecyl sulphate for the treatment of venous malformations of the head and neck. *J Maxillofac Oral Surg.* 2014;14(2):332-8.
10. Kumar S, Kumar V, Kumar S, Kumar S. Management strategy for facial venous malformations. *Natl J Maxillofac Surg.* 2014;5(1):93-96.
11. Mishra M, Singh G, Gaur A, Tandon S, Singh A. Role of sclerotherapy in management of vascular malformation in the maxillofacial region: our experience. *Natl J Maxillofac Surg.* 2017;8(1):64-69.

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