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Original Research Paper

Anaesthesiology

ANAESTHESIA IMPLICATIONS IN A CASE OF PULMONARY ARTERIOVENOUS MALFORMATION POSTED FOR ENDOVASCULAR EMBOLISATION

Dr Sanica Kadam

Dr. Sunil Chapane

ABSTRACT

Introduction: Pulmonary AVM is a condition in which a structurally abnormal connection is present between the pulmonary artery and vein. This creates a pathologic right to left shunt impairing the exchange of gases and oxygenation of venous blood . **Case Report:** A 50yr female with breathlessness on exertion since 6 months, gradually progressive, which increased while sitting and relieved in supine position, with episodes of epistaxis , diagnosed with pulmonary AVM was scheduled for endovascular embolization . Standard ASA monitoring devices were applied and intravenous access secured. General anaesthesia was administered using inj fentanyl 100ug , Inj etomidate 20mg and Inj rocuronium 50mg. Lung protective ventilation was provided with low tidal volume and high respiratory rate , baseline spo2 of85-90%was accepted . Post embolization, spo2 improved significantly. Patient was extubated and was uneventful. **Results:** A basic knowledge of this condition amongst all team members is necessary in providing safe anesthesia. **Conclusion:** General anaesthesia in pulmonary AVM is tricky due to the risk of rupture during positive pressure ventilation. Reassurance that the anesthesiologist is familiar with this condition reduces patient anxiety.

KEYWORDS :

INTRODUCTION:

Pulmonary AVM is a condition in which a structurally abnormal connection is present between the pulmonary artery and vein. This creates a pathologic right to left shunt which impairs the exchange of gases and oxygenation of venous blood .

About 80%-90% of patients with PAVMs eventually may present with hereditary hemorrhagic telangiectasia (HHT), whereas others are sporadic.Acquired causes of PAVM are rare and include chest surgery, trauma, actinomycosis, schistosomiasis, hepatic cirrhosis related hepatopulmonary syndrome (HPS) and metastatic carcinoma.

These patients can be asymptomatic, but become symptomatic with increasing degree of mixing of deoxygenated blood through the PAVM causing hypoxemia, fatigue, dyspnea, and cyanosis.Pulmonary manifestations represent the most common serious complications in HHT and consist of PAVM, pulmonary hypertension, hemoptysis, hemothorax and pulmonary embolism Pulmonary emboli can lead to paradoxical systemic embolism due to right to left shunting through the PAVM. Complications of paradoxical systemic embolization include stroke and brain abscess.

A 50 year female, presented with complaint of shortness of breath since 4 months, NYHA grade I which gradually progressed to grade II ,which increased in the supine position and was relieved on sitting up. She also complained of intermittent episodes of epistaxis since childhood which were relieved spontaneously and which did not require medical intervention.

On examination, she was of average built with a BMI of 25.39. On systemic examination of the cardiovascular system, a machinery murmur was heard in the aortic and pulmonary area. Rest of the systemic examination –WNL

Her Spo2 in supine position92%, however it increased to 97% in sitting position.

Investigations:

CXR showed mild cardiomegaly

ECG suggestive of Left Axis Deviation and poor R Wave progression

CT Angiography: Pulmonary AVM(7.6*5.3cm) in anterior segment of right upper lobe with segmental artery as the feeding artery and superior right pulmonary vein as the draining vein

2D ECHO: Mild TR
Mild PH(PG=30mmHg)

Photo showing the arteriovenous malformation on digital subtraction angiography

The patient was Now posted for endovascular embolization of the pulmonary arteriovenous malformation in the interventional radiology suite.

On the day of the surgery, the patient was taken in after confirming the starvation status and after written informed consent. All monitors were attached and intravenous access was secured. Spo2 was 88% in supine position.

The patient was induced under general anesthesia with endotracheal tube using using Inj Fentanyl 1-2ug/kg, Inj etomidate 0.3mg/kg and Inj Rocuronium 1mg/kg, Endotracheal tube was inserted with direct laryngoscopy,and its position confirmed with capnography, and 5 point lung

auscultation.

Lung protective ventilation provided with lower tidal volume and a higher respiratory rate. Antibiotic administered prior to the start of the procedure.Adequate hydration maintained throughout the procedure.

Post procedure, Spo2 improved significantly to 97%, confirmed with serial arterial blood gas analysis reports. The patient was extubated post embolization, her recovery uneventful.

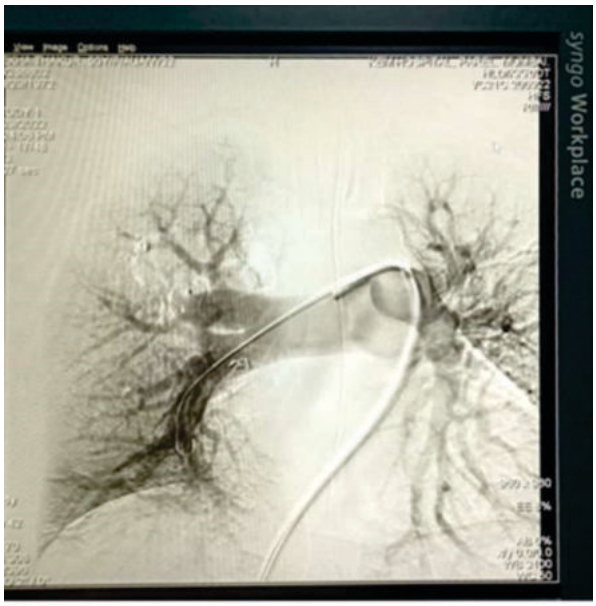

Photo showing coiling done for the malformation

DISCUSSION:

Pulmonary arteriovenous malformations pose multiple challenges to an anesthesiologist.

They cause chronic hypoxemia in patients which results in polycythemia and increase blood viscosity. This can sometimes hamper tissue oxygenation especially patients under general anestheisa and so adequate hydration is needed to ensure adequate tissue perfusion.

Also these patients are more prone to infections due to direct shunting of bloof from the venous to the arterial circulation. Hence antibiotic prophylaxis at the beginning of the procedure is a must.

Total intravenous anesthesia is preferred to inhalational anesthesia as these agents further increase shunting. Ventilation strategies include lower tidal volume and higher respiratory rates to minimise the chances of rupture of the malformation. Also a close watch on the airway pressures and capnography is needed to look for rupture of the aneurysm or embolization.

CONCLUSION:

Pulmonary arteriovenous malformation poses quite a challenge to the anesthesiologist. A basic understanding of the challenges presented in this conditions and the possible complications will help In providing a safe and effective anesthesia

Conflict of interest: nil

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