

ANESTHETIC IMPLICATIONS IN A PATIENT WITH A CHRONIC MASSIVE UNRUPTURED ILIAC ARTERY ANEURYSM!

¹Dr. Sheetal Jayakar, ²Dr. Naveen Kumar, ³Dr. Sreemayee Kulkarni, ^{4*}Dr. Sriram Mahalingam

¹Associate Professor, Department Of Anaesthesiology, Dr. D. Y. Patil Medical College, Hospital and Research Centre, Dr. D. Y. Patil Vidyapeeth, Pimpri, Pune- 411018, Maharashtra, India.

²Resident, Department Of Anaesthesiology, Dr. Dy Patil Medical College, Hospital and Research Centre, Dr. D. Y. Patil Vidyapeeth, Pimpri, Pune- 411018, Maharashtra, India.

³Resident, Department Of Anaesthesiology, Dr. Dy Patil Medical College, Hospital and Research Centre, Dr. D. Y. Patil Vidyapeeth, Pimpri, Pune- 411018, Maharashtra, India.

^{4*}Resident, Department Of Anaesthesiology, Dr. Dy Patil Medical College, Hospital and Research Centre, Dr. D. Y. Patil Vidyapeeth, Pimpri, Pune- 411018, Maharashtra, India.

CORRESPONDING AUTHOR

Dr. Sriram Mahalingam, Resident, Department Of Anaesthesiology, Dr. Dy Patil Medical College, Hospital and Research Centre, Dr. D. Y. Patil Vidyapeeth, Pimpri, Pune- 411018, Maharashtra, India.

SUMMARY

This is a case of a patient that presented to the outpatient department with a large chronic iliac artery aneurysm and the anesthetic complications that occurred during the surgical resection of the swelling and associated management of massive blood loss, and hemodynamic changes that occurred during the cross clamping and unclamping of the aorta. In this case report we discuss the importance of being prepared for the expected and unexpected complications, accepted ischemia time, need for inotropic supports, and then the management of associated hypotension during the unclamping of the aorta, and most importantly, a vigilant anesthetist!

BACKGROUND

Chronic Iliac artery aneurysms are a rare finding in the medical world. Surgical removal of the aneurysm is the only feasible solution for the condition, otherwise risking sudden rupture and catastrophic consequences.

The dire size of the aneurysm and chronicity of this particular case, required for a well prepared, planned anesthetic management, expecting multiple complications.

This article is an attempt to help our fellow doctors, to deal with similar scenarios.

CASE PRESENTATION

A male patient in his late 60's, a known hypertensive since past couple of months on Tablet Amlodipine 5 mg OD, presented to outpatient department with complaints of pulsatile swelling in the left inguinal region of size 11x 9 cm (Video 1). Patient is a known case of peripheral vascular disease with history of left popliteal artery thrombosis 4 years back, for which he underwent a popliteal bypass surgery under regional anesthesia. He required repeated blood transfusions due to the major surgery's massive blood loss, and he also needed a day in the intensive care unit for monitoring and recovery. He is a chronic smoker and

tobacco chewer for 20 years. Patient had no other co morbidities or any other significant history.

Upon examining the patient preoperatively, his vital signs were within normal limits. PR – 80/min, BP – 130/90 mm hg, saturation was 100% in room air. Systemic examination was within normal limits. All routine examinations were done and were normal. Hemoglobin was 14 gm/dl, platelet count was 1.2 lakhs. 2D ECHO showed an EF-60%, Normal LV systolic function; grade 1 diastolic dysfunction, Grade 2 Mitral regurgitation, calcified anterior mitral leaflet tip and mild concentric left ventricular hypertrophy. Electrocardiography showed changes suggestive of right bundle branch block. In Airway examination – Mallampatti class 2, 3 finger mouth opening, and patient was edentulous. Prior to surgery cardiology consultation was done in view of 2D Echo changes and fitness was got under due cardiac risk. Patient and relatives were counselled for need for intraoperative central venous catheterization and invasive blood pressure monitoring since this is a surgery with high risk of sudden blood pressure fluctuations and massive blood loss. They were also counselled about need for post operative need for intensive care admission and requirements for elective mechanical ventilation postoperatively. Fitness was given under ASA 3.

On the day of surgery, NBM period was checked, all consents were checked, preoperative vitals were noted. PR -80BPM, BP -120/90. Two wide bore IV cannula was taken. All monitors were attached (figure 3).

Epidural catheter inserted at L2-L3 inter vertebral Space, using 18G Touhy's needle in sitting position, epidural space was achieved at 3.5 cm and the catheter was fixed at 9 cm from blue tip.

Patient was preoxygenated with 100% oxygen for 3 minutes. Pre medication with 0.2 mg Glycopyrrolate and 1 mg Midazolam was given. Fentanyl 100mcg was given.

Patient was induced with 100mg Propofol. After confirming ventilation, 100 mg of Succinylcholine was given. Patient was intubated with 8.5 Endo Tracheal tube and 12mg of Cis-atracurium was given as a loading dose and the patient was maintained with Sevoflurane and Cis-atracurium infusion at the rate of 6 mg /hour. ultrasound-guided, right internal jugular vein was catheterized using seldinger's method by means of anterior approach. The patient's bladder was catheterized and an arterial line was put into the right radial artery for invasive blood pressure monitoring.

Total duration of surgery was eleven hours. First dose of epidural top up was given with 10 cc of 0.3 mg /cc of morphine, followed by intermittent doses of 0.25% bupivacaine was given throughout the procedure. Short duration vasodilators (Nitroglycerin) at 1-2 ml/hr [0.25 micrograms] was used along with increased inhalational agents for the hypertensive response seen with aortic cross – clamp application.

Vasodilator [Nitroglycerin] was tapered off along with adequate fluids [PCV, crystalloid] resuscitation during aortic unclamping. Positive inotropic drugs, Noradrenaline at 4ml/hr and Vasopressin at 12ml/hr were started and tapered off accordingly to maintain the mean arterial pressure between 65-75 mm hg to maintain the auto regulation of vital organs. There was a total blood loss of 3.5 liters that occurred throughout the surgery which was replaced

by transfusion of 6 pints of PCV, 6 pints of Fresh Frozen Plasma, 6 pints of Random Donor Platelet and 6 liters of crystalloids along with calcium correction (figure 4). Intraoperatively serial arterial blood gas monitoring was done and electrolyte corrections, acid base corrections were done, accordingly.

At the end of surgery patient was shifted intubated to surgical ICU and electively ventilated for next 24 hours. Post operatively, all investigations were done and patient was found to be in respiratory acidosis. Acidosis was corrected, post op hemoglobin was 9.6 gm/dl. On post operative day one, after ensuring that patient is having adequate respiratory efforts, patient was extubated uneventfully. Patient was discharged after 1 week.

OUTCOME AND FOLLOW-UP

Patient was electively put on ventilatory support in view of massive blood loss and multiple blood transfusions for a day.

He was extubated on post operative day one in the intensive care unit after correction of electrolytes and respiratory acidosis.

Post extubation, patient was fully conscious, oriented to time place and person, with no particular findings in systemic examination.

He was kept in ICU till Post operative day 3, for observation, shifted to ward later and discharged on Post Operative day 7 without any complications.

DISCUSSION

Care must be exercised to maintain the patient's hemodynamic stability throughout anesthesia induction and to stop the hyperdynamic response brought on by intubation.

The degree of cross-clamping in the case of an abdominal aortic procedure is infrarenal, meaning that the aorta is fully cross-clamped underneath the origin of the renal arteries. Rapid fluctuations in the patient's condition warrants immediate response. Aortic cross-clamping generates an abrupt rise in afterload, and systemic vascular resistance. This rise has the potential to cause left ventricular failure, arrhythmia, and myocardial ischemia. The severity of the unfavorable effects on the myocardium increases with the proximity of the cross-clamping.⁽⁵⁾

The patient's condition can be stabilized and helped by the administration of vasodilators and the activation of the epidural anesthetic prior to cross-clamping. Collateral circulation provides some blood flow to the large intestine and lower limbs during aortic cross-clamping, although renal circulation is substantially compromised. Inflammatory mediators are released by leukocytes, platelets, and endothelial cells as a result of these circulation alterations.

The abrupt decrease in afterload that results from discontinuing aortic cross-clamping is largely due to the removal of the mechanical blockage, however the stored vasodilator mediators returning to the systemic circulation, plays a significant part in hemodynamic changes. Along with vasodilation, the condition is made worse by metabolic acidosis and increased capillary permeability. Before removing the aortic cross-clamp, appropriate circulatory volume must be provided and a steady blood pressure must be maintained. To accomplish this, mannitol and pressor medications can be used. To achieve the shortest hypoperfusion time, every effort must be done.

Following surgery, vigilant observation should continue, and proper pain management must be taken into consideration. In the early postoperative phase, systemic hypertension, which is often temporary, may result from the pressure rise in the renal arteries if the infrarenal cross-clamp time is longer than 60 minutes.

LEARNING POINTS/TAKE HOME MESSAGES

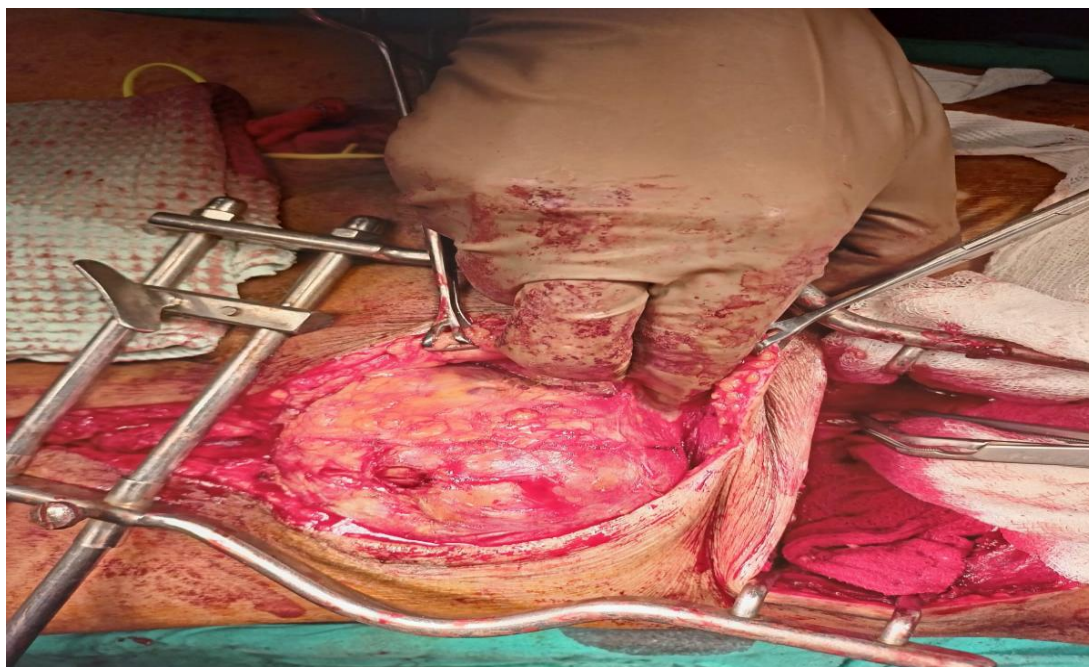
Open repair of an iliac artery aneurysm, one of the most high-risk surgeries, that too, to be carried out on a patient with serious coexisting conditions, presents as a challenging task to the anesthetist.

We managed to achieve a good outcome by good optimization of patient pre operatively, well planned surgical intervention and maintaining perioperative hemodynamic stability during clamping and unclamping by judicious use of blood and blood products, fluids, vasoactive agents, maintaining normothermia close monitoring of vital parameters, good intraoperative as well as well as postoperative analgesia.

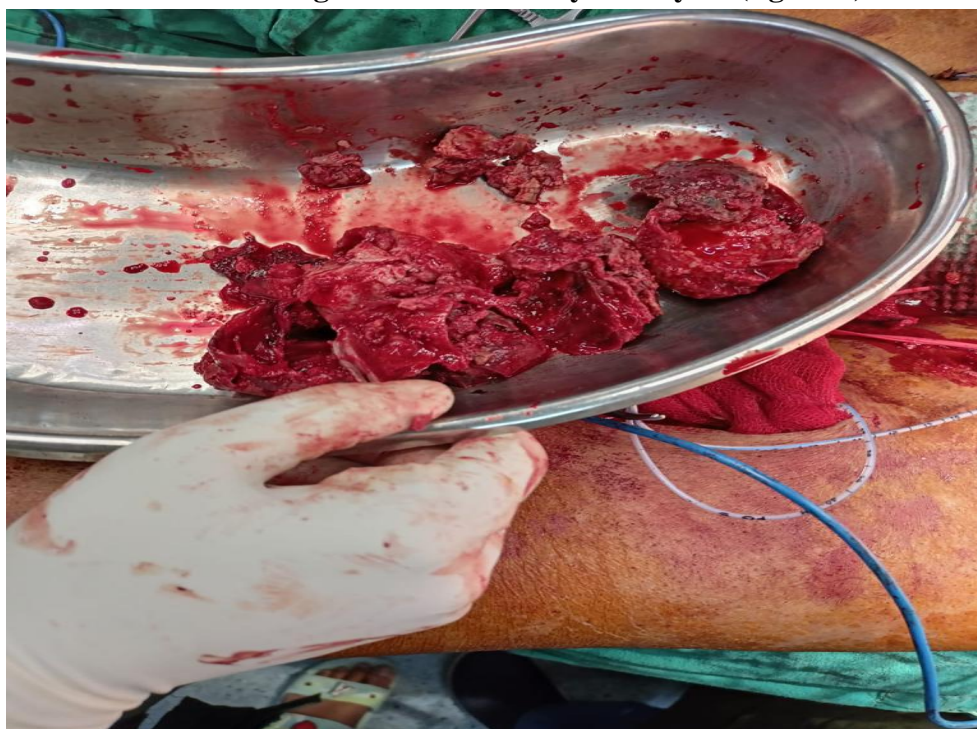
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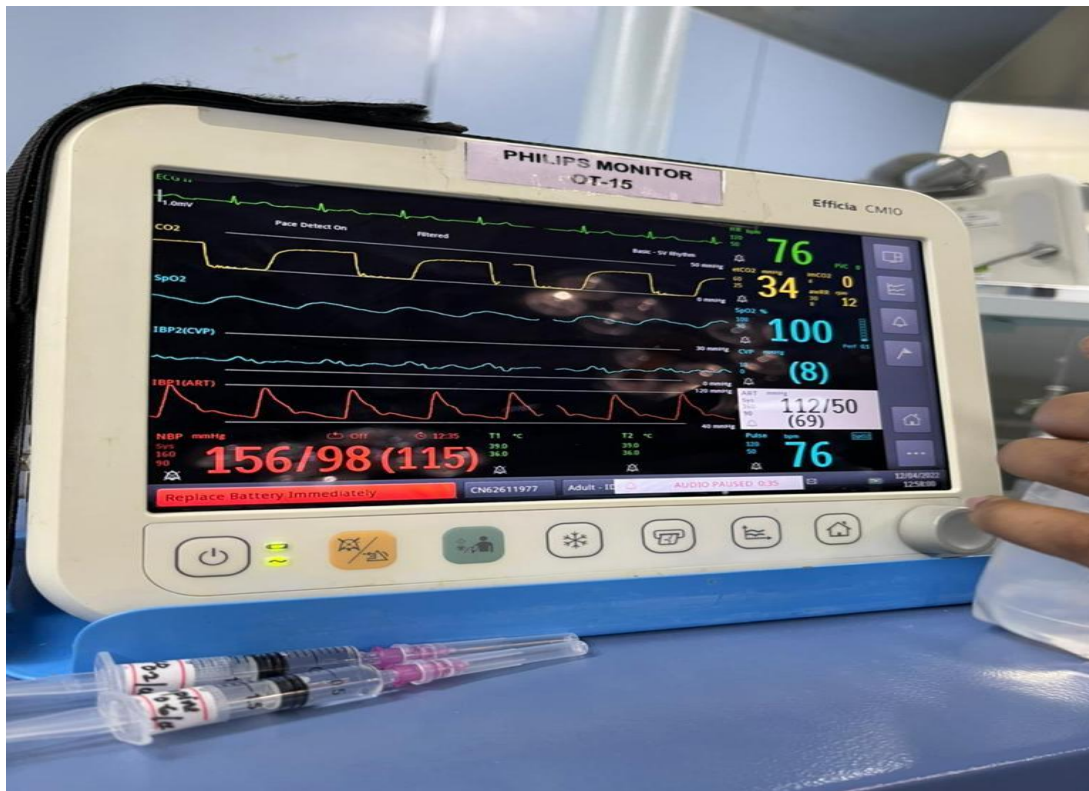
FIGURE/VIDEO CAPTIONS



Dissected image of the iliac artery aneurysm (figure 1)



Massive thrombus removed from the aneurysmal site (figure 2)



Various invasive and non-invasive monitoring that was used as a part of intraoperative management (figure 3)



Image showing the number of mops and gauze pieces that was used during surgery. It is to be noted that this is only part of the blood loss that happened and that the remaining blood has been suctioned out by the surgeons (figure 4)