



ANAESTHETIC MANAGEMENT OF INTESTINAL OBSTRUCTION IN A PATIENT HAVING RUPTURED ANEURYSM IN RIGHT SINUS OF VALSALVA UNDERGOING EMERGENCY EXPLORATORY LAPAROTOMY

Anesthesiology

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ABSTRACT

Summary

A 31 year old female weighing 40 kg with obstetric history of para 2, live birth 2 presented with complain of pain in abdomen since 2 days. Patient was already admitted in cardiac ward since 15 days in view of complain of breathlessness on rest and history of pedal oedema post full term normal delivery 2 months back.

KEYWORDS

Ruptured Aneurysm Of Right Sinus Of Valsalva, Intestinal Obstruction, Epidural Anaesthesia

INTRODUCTION

Sinus of Valsalva aneurysms are uncommon cardiac anomalies that may be congenital or acquired⁽¹⁾. It was first described by Hope in 1839. Thurnam in 1840 reported the first case of rupture of the sinus of Valsalva. The congenital form is more common with an incidence of 0.1 to 3.5% of all congenital heart defects. Acquired aneurysms may be secondary to endocarditis, syphilis, trauma, Marfan's syndrome and senile dilatation⁽¹⁾. The defect is typically single and starts as a blind pouch from a localised site in one of the aortic sinuses but rarely multiple sinuses may be affected⁽²⁾. The usual sites of the defects are the right coronary and noncoronary sinuses, aneurysms of the left coronary sinus being relatively rare^(3,4). The mortality rate in patients with a sinus of Valsalva aneurysm in whom surgery is not performed is high within the first year after rupture. Cases of sudden death from sinus of Valsalva aneurysm most commonly involve rupture of the aneurysm with the acute onset of overwhelming congestive heart failure, cardiac tamponade, dysrhythmia, or coronary ischemia depending on the location of the aneurysm and thus subsequent flow disturbance. Size and location of the shunt are the major determinants of presentation and prognosis. Two dimensional echocardiography with colour flow provides an accurate non-invasive means of demonstrating the aneurysm and the left to right shunting following rupture⁽⁵⁻⁶⁾. We present a case of ruptured saccular sinus of non coronary sinus of Valsalva which was diagnosed using two-dimensional echocardiography with doppler and colour flow.

Case report

A 31 year old, 40 Kg, female was admitted in our hospital with complaints of breathlessness on rest and occasional palpitations since last 15 days. She also complained of swelling of both lower limbs which decreased after taking rest. She had normal full term vaginal delivery 2 months back. She complained of breathlessness and tiredness on rest since few days gradually increasing in intensity, post vaginal delivery for which she consulted physician. She was informed that she has a heart disease and was diagnosed as ruptured aneurysm of right sinus of Valsalva. She was advised to undergo surgical correction of the heart ailment. But the patient could not afford the surgery and was seeking medical management from our hospital. Patient was on Inj. Augmentin 1.2 gm QID, Inj. Lasix 10mg/hour and Tab Aldactone 25 mg bd. Suddenly patient had complaint of pain in abdomen since past 1 day sudden in onset, progressive in nature associated with vomiting and constipation.

On examination, her pulse rate was 110/minute, B.P. 110/80mm of Hg, SpO2 97% and respiratory rate 44/min. Patient was alert, responsive, oriented to time, place, person with severe icterus and bilateral pitting type of pedal oedema. Respiratory system showed bilateral basal crepitations. On auscultation of cardiovascular system a loud continuous murmur was present over whole of the precordium. Per abdomen pulsatile conducting sounds were heard. Routine blood investigations were as follows Hb-10.6gm%, total count- 10,650, platelet count- 1.70. Patient's Prothrombin time was 15.7 and INR

1.08. Serum electrolytes were [Na]-128, [K]- 3.4 and [Cl]- 88 mmol/L. LFT's showed Total bilirubin-5.65, direct bilirubin- 3.21, Indirect bilirubin- 2.44, SGOT- 163.7, SGPT 189.5, Alkaline phosphate- 169, total proteins- 6.08, albumin- 3.24, Globulin- 2.04. Electro-cardiogram showed sinus tachycardia and old inferior wall MI. 2D echo showed ruptured saccular sinus of non coronary sinus of Valsalva measuring 1.59 cm * 0.95 cm with severe AR with Grade III TR and moderate PAH with normal LVEF (60%). A diagnosis of perforated aneurysm of right sinus of Valsalva was confirmed. Patient was continued with inj. aldactone and lasix. Further in view of complain of abdominal pain USG was done that showed small bowel obstruction with perforation due to adhesions in inter bowel pelvis region. Reports of Xray chest showed gas under the diaphragm.

Patient and her family was informed about the obstruction and emergency exploratory laparotomy that had to be done. At 8.30 pm pre anaesthetic evaluation was done. High risk consent for anaesthesia was taken. The patient was shifted to operation room in propped up position breathing oxygen by apolymask. One large bore 18G IV canula was secured. Intravenous ranitidine 50mg and metoclopramide 10mg were given prior to induction for aspiration prophylaxis. Antibiotic prophylaxis was obtained with 2gm of intravenous amoxycillin. Monitoring of pulse rate, electrocardiography, oxygen saturation, EtCO2, urine output and non-invasive blood pressure was started and continued throughout the surgery. Central venous access was obtained via the right internal jugular vein. Central venous pressure (CVP) was monitored throughout the surgery and was kept within normal limits. Patient was then taken in sitting position. Back was painted and draped. L1-L2 intervertebral space was palpated and identified. Under all aseptic precautions 16G epidural needle was inserted by loss of resistance technique. Epidural catheter was inserted and fixed at mark 10. Patient was taken back in supine position. Test dose of Lox2% + Adrenaline (3ml) was given. No hemodynamic changes were seen post administration of test dose ensuring intra thecal placement of catheter. 0.25% of Inj. Bupivacaine was given through epidural catheter. T6 level of anaesthesia was achieved. Patient was maintained on 6L of oxygen and intermittent 0.125% of Inj. Bupivacaine.

Intra operatively patient was hemodynamically stable with pulse rate 90-100/min. BP-100/70 mmHg and SpO2 99%. Intra operative blood loss was approximately 300ml. One crystalloid Ringer lactate was infused. Fluid replacement was guided by the CVP monitoring. Surgery lasted for 120 minutes. At the end of surgery urine output was 100ml. Patient was shifted to the Cardiac Intensive Care Unit (ICU) for observation.

DISCUSSION

A ruptured sinus of Valsalva aneurysm is a rare cardiac anomaly usually of a congenital nature. The sinuses of Valsalva are dilatations in the aortic wall immediately superior to the attachments of three aortic wall cusps. The sinuses are named according to their relationship with the coronary arteries: i.e. the right coronary sinus, the left coronary

sinus, and the non coronary sinus.⁵ Aneurysmal dilatation of the sinuses of Valsalva occurs when the aortic media is defective, resulting in lack of fusion between aortic media and annulus fibrosus of the aortic valve.⁶ Aneurysm typically develops as a discrete flaw in the aortic media within one of the sinuses of Valsalva. Under the strain of aortic pressure, the sinus gradually weakens and dilates, causing the formation of an aneurysm. Lack of supporting tissue (e.g., ventricular septal defect) may contribute to instability and progressive distortion of the aortic sinus. Distortion and prolapsed of the sinus and aortic valve tissue can lead to progressive aortic valve insufficiency. Other cases result from an inherited connective tissue abnormality, as in Marfan syndrome or Ehlers-Danlos syndrome; from inflammatory disease, as in endocarditis, syphilitic or granulomatous aortitis, or Behcet's disease; and from mechanical disruption after stab wounds, aortic dissection, or after aortic valve replacement or ventricular septal defect repair.

The right coronary sinus is the most common site of aneurysm formation mostly ruptures into the right ventricle, producing left to right shunting.⁷ Right coronary sinus aneurysms may also rupture into the right atrium. Non coronary sinus aneurysms generally rupture into the right atrium. Left coronary sinus aneurysms are extremely rare, but they may rupture into the pericardium, resulting in cardiac tamponade and death if not quickly recognized. Echocardiography is very accurate and reliable tool in diagnosing a sinus of Valsalva aneurysm when correlated with clinical findings.⁸ In addition Computed tomogram angiography and magnetic resonance imaging also have been reported useful in diagnosing the sinus of Valsalva.⁹⁻¹⁰ Cine phase contrast MRI can be used for assessment of insufficiency and shunt flow.

Sinuses of Valsalva aneurysms have one of three basic pathologic patterns.⁵

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- Unruptured aneurysms may cause distortion and obstruction in the right ventricular outflow tract. Dissection of the aneurysm into the cardiac tissue may occur, causing obstruction or destruction of adjoining structures. Aneurysm may compress the interventricular septum, resulting in complete heart block with subsequent dizziness and syncope. Coronary artery compression may occur producing myocardial ischemia and chest pain. Occasionally a patient with unruptured sinus of Valsalva aneurysm presents with symptoms related to chronic aortic regurgitation.
- A slowly enlarging small perforation develops a fistulous tract in to the right ventricle and presents with a small left to right shunt. Major risk is infective endocarditis an extension of rupture with an increased shunt. Patient may remain asymptomatic for several years because of haemodynamic adjustment. However, as the degree of shunting increases symptoms related to volume overload, such as dyspnoea and exercise intolerance develops.
- An aneurysm that actually ruptures is often heralded by the sudden onset of dyspnoea and severe chest pain. Following this initial symptomatic period, the patient may become asymptomatic even without treatment as the body adjusts haemodynamically to the left to right shunting. However as the shunting and volume overload overcome the compensatory mechanisms, symptoms of congestive heart failure result.

Ruptured sinus of Valsalva connects the high pressure reservoir of the systemic circulation with the low pressure system of the pulmonary circulation resulting in a systolic-diastolic left to right shunt. There is volume overload of the left atrium, left ventricle and the aortic root that is proportional to the shunt volume. Amount of shunt volume is influenced by the diameter of the rupture and by the level of pulmonary vascular resistance. A large shunt causes a large volume of blood that is shunted from the systemic circulation, into the pulmonary circulation. The inevitable consequence of this is pulmonary congestion and rapidly developing left sided heart failure.

Differential diagnosis may be venous hum, patent ductus arteriosus, traumatic injury to the aortic root, infective endocarditis, ventricular septal defect with aortic regurgitation, truncus arteriosus with truncal valve, aortico ventricular tunnel.

CONCLUSION:

This case emphasises that even though many things are not in our hand but we can save lives by timely intervention with efficient and coordinated team efforts even in a critical case of intestinal obstruction in a patient having ruptured aneurysm of right sinus of Valsalva.

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