

A LEFT ATRIAL MYXOMA FROM UNUSUAL SITE: ANAESTHETIC MANAGEMENT AND REVIEW OF THE LITERATURE

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ABSTRACT

Myxomas are rare tumours but are the most common benign tumours of the heart. They can arise from any heart chamber. However, they arise more frequently from the inter-atrial septum of the left atrium. When diagnosed, these need to be surgically excised as early as possible as these are known to cause dangerous complications, e.g. intracardiac obstruction and embolism. Anesthetic management was challenging. We present anesthetic experiences of myxoma removal surgery in a patient with left atrial myxoma from unusual site- posterior LA wall and review of the literatur of the cardiac tumor.

Key words: atrial myxoma, anaesthetic management.

I. INTRODUCTION

Primary cardiac tumors are extremely rare^[12]. As an example, in one series of over 12,000 autopsies, only seven were identified, for an incidence of less than 0.1 percent^[13]. Myxomas are the most common type of primary cardiac tumors with the majority (75-85%) originating from the left atrium and a smaller percentage from the right atrium (25%) ^[15]. We report a case of a large atrial tumor from unusual site- posterior LA wall that occupied most of the space in the left atrium and caused pulmonary hypertension due to obstructing pulmonary veins. Anesthetic management was challenging due to the potential for cardiovascular collapse with induction, bleeding, emboli, and significant postoperative complications. With careful preoperative optimization including fluid resuscitation and vigilant monitoring, this patient was able to have a safe anesthetic for her surgical removal of this complex mass.

II. CASE REPORT

A 55- year-old women was admitted to our hospital. She had syncope but no history of cardiac symptoms, no fever, and her past medical history was unremarkable. On admission, patient's heart rate was regular and her blood pressure was 120/70 mmHg. Blood biochemistry was revealed to be normal. The 12-lead electrocardiogram showed regular sinus rhythm but the chest radiograph demonstrated interstitial pulmonary edema. Review of the chest film revealed that the edema was only slightly more prominent on the left. A coronary angiography showed demonstrated no coronary artery disease. As a part of the cardiologic workup a transthoracic echocardiography (TTE) examination was performed. A large mobile mass measuring 57 × 36mm was noted in the left atrium. It descended into the mitral valve during diastole, leading to dynamic inflow obstruction. There was an eccentric jet of moderate mitral regurgitation, directed around the lateral border of the mass. In

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addition, there was severe tricuspid regurgitation, with an estimated pulmonary pressure 80 mmHg. A subsequent transoesophageal echocardiography (TOE) demonstrated a gelatinous, heterogeneous mass with echolucent regions attached to the posterior wall of the left atrium but rather to the fossa ovalis. In addition, this exploration revealed

that the lesion extended into the left pulmonary veins. Evidence of inflow obstruction of left ventricular outflow tract (LVOT) was present. There was no mitral regurgitation and the left atrial size was normal. The mass had multiple lobes, was highly echogenic and appeared to obstruct LVOT.

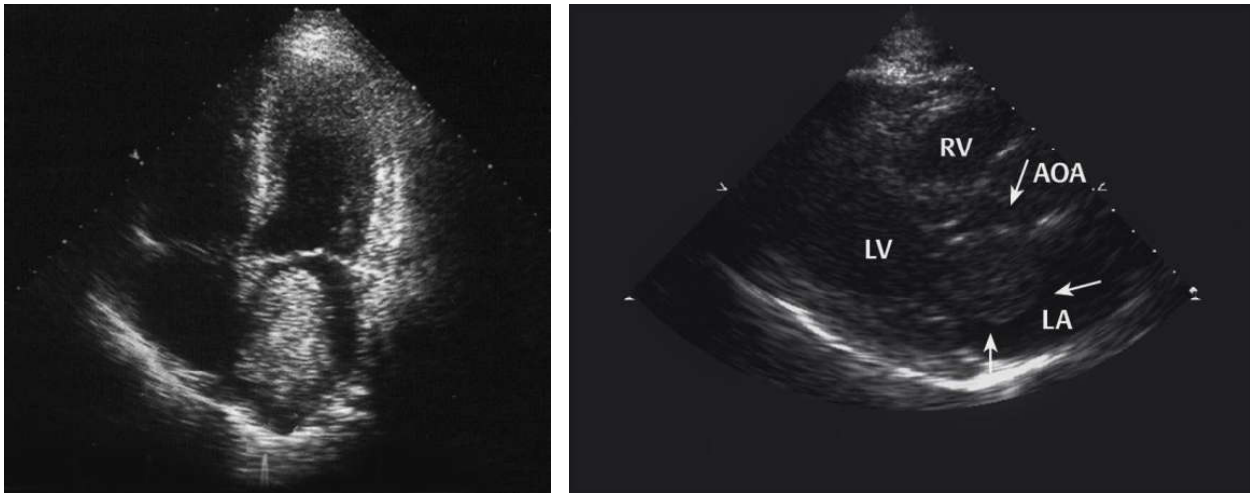


Figure 1: Transthoracic echocardiography: Chambers view showing a large mobile left atrial mass prolapsing through mitral valve



Figure 2: Transoesophageal echocardiography: Atrial tumor prolapsing through mitral valve toward the left ventricle during ventricular diastole (arrow)

Preoperative vital signs showed blood pressure at 120/80 mmHg and heart rate at 85 bpm. On shifting the patient to the operating room, all routine monitors i.e. 5-lead electrocardiogram, pulse oximeter, noninvasive blood pressure and end tidal CO₂ were connected and basal values were noted. A left radial arterial line was placed before anesthetic induction. 100mg of propofol and

150 mcg of fentanyl were slowly injected intravenously. After adequate mask ventilation was confirmed, 40mg of rocuronium was intravenously injected. Expecting severe adhesions from the multiple numbers of myxoma removal surgeries, a large bore intravenous line as well as the central line was maintained and the cell saver was prepared as provisions for massive bleeding.



Surgeons were ready. After general anesthesia, a multiplane transesophageal echocardiography probe was inserted into the esophagus without difficulty. Anesthesia was maintained with sevoflurane at 1-2 vol%, fentanyl and rocuronium. During the operation, vital signs were stable with blood pressure at 100-120/50-60 mmHg and heart rate at 80-90 bpm. The patient was referred for urgent surgical resection. The oval mass and part of posterior wall of the LA from which it originated were excised.

After removal of the tumor and weaning from bypass, the pulmonary artery pressure reduced as low as 25-30 mmHg and remained consistently below 30 mmHg in the postoperative period. Histological examination confirmed the diagnosis of atrial myxoma with occasional spindle and stellate cells in an eosinophilic matrix. After surgery, the patient was transferred to the intensive care unit where she was under observation for a day. Hemodynamic status of the patient stabilized, so two days after she was transferred to the ward. Post-operative echocardiography showed no remnant mass in the atrial ventricular outflow tract. Her systolic PAP was 25-30 mmHg.

III. DISCUSSION

Myxomas are commonest primary benign intracavitary tumours with the incidence of 0.5 per million populations. Although atrial myxomas are typically benign, local recurrence due to inadequate resection or malignant change has been reported^[15]. Myxomas account for 0.3% of all cardiac surgeries performed. Approximately 75% of sporadic myxomas occur in females. In a series of 66 cardiac myxomas, the female-to-male ratio was 2,7:1^[14], and mean year of occurrence is 55 years. Myxomas commonly arise from the left atrium but 25% occurs in the right atrium or ventricles^[15]. Clinically, they are characterized by triad of embolisation, obstruction of blood flow, and

constitutional symptoms (Goodwin's triad)^[1]. 17-59% of patient with myxoma present as embolic event, while cerebral embolisation occurs in up to 45%, and this commonly occurs in the middle cerebral artery territory^{1,4}. Surgical management is the treatment of choice for myxomas but open heart surgery immediately after cerebral embolisation is considered contraindicated due to problems of hemorrhagic infarction or progressive cerebral oedema. But another school of thought considers immediate surgery as the treatment, as recurrent embolisation can be fatal^[6].

Coronary artery embolization, albeit a lethal complication of atrial myxomas, is extremely rare (0.6%). The low rates might be because emboli are less likely to enter the coronary arteries. There is a tendency for embolism into the right coronary artery due to its conductive position. Maddali et al described the case of a 54-year-old man concomitant presence of a left atrial myxoma with coronary artery disease. Because of an isolated 70% occlusion of the left anterior descending artery, the author believed that the CAD in this patient was due to both atherosclerotic disease as well as due to a previous tumour emboli^[16].

Obstruction to blood flow can present with heart failure or syncope in 41-79% of cases. Left ventricular outflow tract obstruction because of the mass can mimic mitral stenosis^[16] and can cause pulmonary hypertension and even congestive heart failure^[1]. In this case, the mass occluded the left pulmonary veins and left ventricular outflow tract and induced pulmonary hypertension with systolic PAP up to 80 mmHg.

Right sided myxoma can also be associated with obstruction and can present as cardiovascular collapse during induction of anaesthesia¹. Fever, malaise, weight loss, fatigue, anaemia, and raised erythrocyte sedimentation rate are common constitutional symptoms which occur in around 90% patients with myxomas^{[1], [4]}. These features

resolve immediately after surgery and are believed to be due to release of inflammatory mediators from tumour cells ^[1, 5]. Structurally, myxomas are of two types, one with round, non mobile surface, and another polypoid type with irregular shape, mobile surface and this latter type has the higher incidence of embolism and this is the commonest type to prolapse into the ventricles ^[6, 15].

The recurrence of myxoma has been reported to be less than 2% on most series. A detail history and a meticulous clinical examination is a must. Risk factors for cardiovascular diseases, other co-morbid conditions, NYHA classification for functional status of the patient should also be assessed properly⁷. Preoperative evidence of heart failure, pulmonary hypertension and evidence of outflow obstruction should be checked for, and treatment started if present. Patients with history of embolism should be properly anticoagulated according to guidelines for anticoagulation and then planned for surgery¹⁰. Apart from routine blood and urine investigations, chest roentgenogram, electrocardiogram, and echocardiogram is essential. Echocardiograms not only give the size of the tumour, but can also locate the origin of the myxoma. In this regard; transoesophageal echocardiogram (TOE) is superior to transthoracic echocardiogram (TTE) ^[1].

Even though arrhythmias are uncommon, atrial arrhythmias if present should be perioperatively treated with either pharmacological or electric cardioversion as indicated^[11]. In patients with evidence of embolism, other investigations are required depending on site of embolism. CT scan and MRI are helpful in embolic stroke while Doppler studies are helpful in cases of peripheral vessel involvement, e.g. carotid or femoral arteries^[7,9]. Adequate premedication helps in allaying anxiety, and avoids detrimental haemodynamics due to it. Apart from basic monitoring; invasive arterial pressure monitoring and central venous line placement is a must in patient undergoing myxoma

excision^[7]. Pulmonary artery catheterization is not necessary unless there are specific indications for it. The use of TOE has now been considered a useful tool for intraoperative diagnosis, localization of the tumour, and also for confirmation of adequate removal ^[1].

Postural hypotension can occur due to prolapse of the tumor mass into a valve orifice. Entrapment of the myxoma in the mitral valve during the course of anesthesia can result in a cardiac arrest. Large left atrial myxomas have caused complete obstruction of the mitral valve orifice, resulting in sudden death. Simply changing body position can vary the extent of valvular obstruction. Placing the patient in the right lateral decubitus position with a head down tilt and vigorously shaking the chest might aid in dislodging the tumor from the mitral valve. Changing myxoma position and sudden mitral orifice obstruction must be considered in these cases and once the diagnosis is made, patients should be operated as early as possible ^[2]. T. Maeda et al reported a cardiac arrest occurred during repositioning of the heart to cannulate the inferior vena cava and transesophageal echocardiography revealed the large myxoma obstructing the left ventricle. Because cardiac arrest can happen at any time, stand-by percutaneous cardiopulmonary support is ideal ^[3]. The surgeons were ready in the operating room during induction in the event that the patient needed to be emergently placed on cardiopulmonary bypass.

Anaesthetic considerations will be as for the patient going for a cardiopulmonary bypass (CPB) and similar to those with mitral stenosis, but a balanced anaesthetic approach is now the preferred method ^[7]. Opiates, along with volatile anaesthetic agents, which have additional advantage of inducing ischemic preconditioning (in patients likely to have ischemic myocardial insults), and any of the commonly used muscle relaxants can be combined for the balanced approach. Benzodiazepines, forms

a core component of the balanced approach and midazolam in particular is preferred for minimal effect on coronary blood flow autoregulation. After the aortic cross clamping and the patient on CPB, anaesthesia can be maintained with the volatile agent through the CPB or can be maintained on low dose propofol infusion for sedation⁷. However, induction with propofol is not advised because of action causing significant depression of myocardium, and hypotension owing to decrease systemic vascular resistance^[7,10]. After the excision of tumour and repair of the opening site, weaning from CPB and reversal of heparin with protamine, checking regular blood gas parameters and activated clotting time are similar to any other cardiac surgery. Fast track cardiac anaesthesia or early extubation following surgery is the goal and should be preferred unless any complications or contraindications occur. Regional anaesthetics, intrathecal or epidural have advantages because of their desirable effects on stress response, haemodynamics, coronary perfusion pressure, myocardial blood flow redistribution and chances of early extubation, but their use is not common, maybe because of concerns for anticoagulation, and potential to cause haematoma and its neurological consequences^[7,17]. Post-operatively the patient should be monitored in an intensive care unit or other high dependency units, where constant supervision, monitoring and

vigilance are available. Anticoagulation should be resumed postoperatively in patients with history of embolism, and in those who were on anticoagulation preoperatively. High incidence of arrhythmias and conduction disturbances have been reported both in early and late post operative periods ^[8].

IV. CONCLUSION

This case report highlights the anesthetic considerations in the successful management of a patient with a giant LA myxoma from unusual site. The patient described in this case was continuously evaluated to achieve a positive outcome. Care was readily altered and optimized using this approach due to the dynamic nature of the mass. TOE continues to be an invaluable diagnostic modality for cardiac masses. It offers accessibility and crucial information on mass morphology, position and mobility. The anesthesiologist must make careful preparations for events from difficult intubation to patient position at the time of anesthetic induction and maintenance. The anesthesiologist must be able to respond immediately and appropriately to sudden complications arising during anesthesia such as massive bleeding. Careful anesthetic planning and preparation, understanding the potential for cardiovascular collapse with induction, anticipation for major blood loss and potential for emboli, are all necessary for a successful outcome.

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