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Anesthetic management of lobulated myxoma (left atrial) resection surgery in an elderly patient – A Case report

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Abstract

Background: Myxomas are rare benign tumors, that arise mainly from the region of "the limbus of fossa ovalis", which is part of the left atria. Cardiac myxomas can be complicated by mitral stenosis, atrial embolization, and infection that requires surgical removal. We presented a case of a 71-year female, who had cardiac myxoma with lobulations. Surgical resection was performed via "median sternotomy under cardiopulmonary bypass with aortic and bicaval cannulation". In the present case report, we highlighted the importance of adequate preoperative patient optimization and anaesthetic consideration in the successful management of resection of myxoma (Left atria) in an elderly patient.

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Introduction

Myxomas are less common "benign tumors" (0.5 million/year in population), Most of the cardiac tumors (30–50%) are seen in the left atrium (>85%).[1] Myxoma increases the risk of "acute cardiogenic shock or sudden cardiac death given the potential for embolization and hemodynamic deterioration upon blood outflow obstruction" in patients.[2]

The 3 main symptoms of myxomas are embolism, intracardiac obstruction & constitutional symptoms. Other common constitutional symptoms are Fever, malaise, weight loss, anaemia, and raised ESR (occur in around 90% of patients with myxoma).[3]

As elderly patients show many physiological and pathological changes, perioperative morbidity and mortality are also higher. Here aspects of aging are important. Conducting the comprehensive perioperative examination can improve the patient's postoperative prognosis. [4]

Most atrial myxomas arise mainly from the "region of the limbus of fossa ovalis" which is part of the atrial septum. Other associated sites include "posterior wall, anterior wall, and appendages in order of frequency (around 10%)".[5] They are "pedunculated, friable, soft, gelatinous, mucoid and usually a grey-white mass with areas of hemorrhage".

Cardiac myxomas can be complicated by mitral stenosis, atrial embolization, and infection.[6] "Sporadic myxomas" can cause various anaesthetic, surgical challenges, and familial cases usually related to other complications resulting from the multifocal character of tumors,[7,8] they have a high rate of recurrence, [7,8] and the presence of associated comorbidities.[7] In the present case report, we highlighted the importance of adequate preoperative patient

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optimization and anesthetic consideration in the successful management of resection of left atrial myxoma in the elderly patient.

Case Report

We report a case of a 71-year female patient presenting with palpitations, fatigue, and chest pain for 1 month. On examination, she was weighing 45 kgs with a pulse of 75/min and blood pressure of 130/80 mmHg. "Surveillance transthoracic echocardiography" suggested one large mobile mass consistent with myxoma approximately 56×36 (mm) with lobulations. Mass was attached to IVS(Interventricular septum)with protrusion into the left atrium with mild pulmonary hypertension. Both (left and right) "ventricular systolic functions were normal and no valvular abnormalities". After pre-anesthetic evaluation, the patient was posted for surgery with written informed consent.

On shifting the patient to the preoperative room monitors like non-invasive blood pressure, pulse oximetry,5 lead ECG were attached and all emergency medications along with the defibrillator were kept ready and all baseline values were noted. 18 G Peripheral IV access was taken then under all aseptic precautions. USG-guided 7 Fr triple lumen catheterization was done through the right Internal jugular vein, Right radial, and Right femoral arterial line was secured under local anaesthesia. Then the patient was preoxygenated for 3 min. with 100 % oxygen and premedicated with Inj. Glycopyrrolate 0.2mg after shifting the patient to the operative room. Induction was done with Inj. midazolam 4 mg, Inj fentanyl 300 mcg, and intubation was facilitated with Inj. vecuronium 6mg and the patient was intubated with a 7.0mm cuffed ET tube. The patient was then put on controlled ventilation and anaesthesia was maintained on oxygen, air, and sevoflurane. Baseline ACT was 120 seconds, the patient was heparinized with 15000 IU of IV Heparin. The procedure was performed via median sternotomy (procedure to separate sternum) under cardiopulmonary bypass with aortic and bicaval cannulation. Intraoperatively haemodynamics were maintained. Intraoperative investigations, arterial blood gas analysis, CBC, sugar, and electrolytes were within normal limits. Injection protamine 150 mg IV was given for reversal of the heparin effect. ACT was 135 seconds after the protamine injection. The postoperative patient was transferred to ICU with an endotracheal tube in-situ electively ventilated and extubated on the next day of surgery. The patient was discharged on the seventh postoperative day without any complaints.

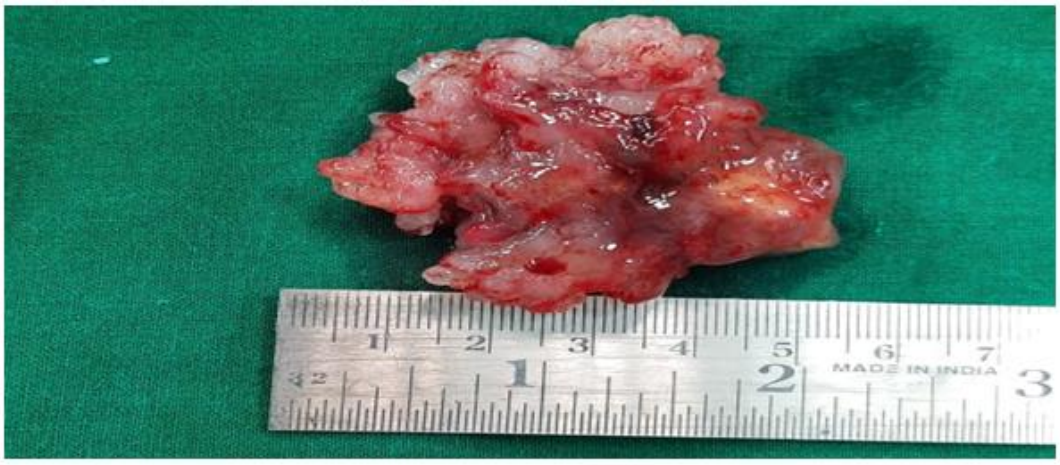

Figure 1: LA myxoma after excision

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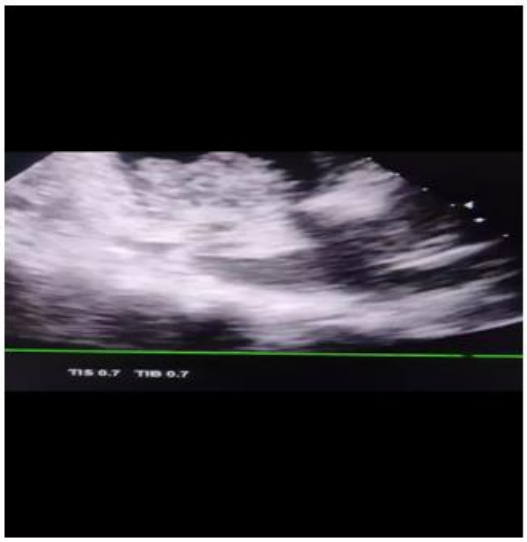

Figure 1 **Figure 2**

Figure 1: TTE showing mass protruding into the left atrium
Figure 2: TTE showing mass attached to IVS

Discussion

Myxomas can affect various functions of the heart leading to life-threatening conditions thus, early diagnosis and prompt treatment has the utmost importance.[12,13]

There are two types of myxoma according to structure round non-mobile surface or polypoidal with an irregular shape, mobile surface. Diagnosis of myxomas is depend on trans-thoracic echocardiography (TTE), moreover, when masses on an echocardiogram are ambiguous or unsatisfactory, or if the tumor is aberrant in appearance, MRI is very useful in determining the size of the tumor and its interactions to surrounding tissues.[10,11]

In a total patient population, myxoma is more commonly diagnosed in the elderly and high-risk patients. It can be detected in senior people who have other particular cardiac and internal disorders and are at a higher surgical risk. Adequate preoperative examination aids in the detection of any concurrent cardiac and non-cardiac disease, which may be useful in the right care of these patients both before and after the surgery.[11]

The acute stress response in the elderly patient reduces due to a reduction in the reserve and function of all major organ systems. In elderly patients, the decrease in beta level causes a reduction in tachycardia leading to hypotension, thus they depend on the preload to maintain sufficient cardiac output. Reduction in the Baroreceptor reflex limits the heart rate, stroke volume, and cardiac output, causing decreased contractility of cardiac muscle and hypovolemia with increasing age. The prevalence of coronary artery disease is higher in elderly patients, who also have a high risk of developing perioperative coronary ischaemia. Chronic hyperglycaemia, widening pulse pressure, and left ventricular hypertrophy all work together to raise myocardial oxygen demand and lower coronary perfusion. Ectopic beats are more common as a result of the aging of the cardiac conduction system, which is also a major cause of numerous arrhythmias. Geriatric people are more likely to develop ventricular complexes, atrial complexes, bundle branch blocks, or atrioventricular blocks depending on where the fibrotic remodeling of the conduction pathway occurs.[3]

The aging process makes elderly patients susceptible to medication and perioperative complications, this is due to aging-associated changes in the central and peripheral nervous system. Owing to pharmacodynamic changes elderly patients require 30% less anaesthesia dose compared to young adults. Cerebral autoregulation is reduced in the elderly patient which leads to increased susceptibility to cerebrovascular accidents. As anaesthesia generally

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reduces cerebral autoregulation, it is necessary to ensure cerebral perfusion and oxygenation. In elderly patients changes in physiological and pathological aging, lead to more susceptibility to nephrotoxicity and change in pharmacokinetics. Elderly patients are at a higher risk of nephrotoxicity due to NSAIDs and IV contrast. And on account of the reduced clearing capacity of the renal and hepatic system, this requires the reduced required dose of many medications and increases the duration of effect.

The anaesthetic regimen for conducting anaesthesia for myxoma excision in an elderly patient requires a balanced anaesthetic approach, as there are higher chances of perioperative complications in elderly patients due to reduced functional inspiratory capacity reserve. Decreases in immune function and loss of physiologic reserve make optimization of the pulmonary system important to prevent hypoxia, hypercarbia, and pneumonia. Benzodiazepines form a core component of a balanced approach, particularly midazolam is preferred for its minimal effect on coronary blood flow autoregulation.[14] anaesthesia management aims to avoid myocardial depression, prevent obstruction of transmitral blood flow, intraoperative embolism, prevent /treat arrhythmias and associated hypoxia, careful positioning and titrated induction technique to prevent sudden hypotension, to prevent hypoxemia due to obstruction, decreased cardiac output, pulmonary edema.

Intraoperative difficulties with cardiac myxomas originate from a variety of possible issues, including the existence of intracardiac blood flow restriction, and can present with haemodynamic variations, however in the present case, anaesthetic management focused on the avoidance of myocardial depression and hypoxia, considering these implications anaesthesia was maintained for the surgical resection. Excision of an atrial myxoma is related to a 2.2% early postoperative mortality.[17] In 23-33% of patients, postoperative atrial fibrillation is seen. Older surgical patients require a greater degree of perioperative care since they are more likely to have postoperative problems due to various chronic conditions. However, in the present case, the patient did not develop any complications postoperatively and was discharged on the seventh day. Independent predictors of outcomes included "advanced age, left atrial diameter, and mitral valve surgery".[17,18]

"Anesthetic mode and pharmacology, monitoring, intravenous fluid or transfusion management, lung-protective ventilation, and prevention of hypothermia included in intraoperative management and postoperative checklists included perioperative analgesia, postoperative delirium and cognitive dysfunction, and other complications".[19]

Intraoperative TEE monitoring is paramount important in optimal patient care for hemodynamic monitoring, to decide the position of myxoma and confirm complete removal of mass to prevent further chances of emboli and to see that there is no damage to adjacent structures.[14] However due to the non-availability of perioperative TEE, we limited it to the diagnostic purpose only. Among elderly patients, age-related non-cardiac diseases and patients' preoperative state also have an essential effect on mortality and cardiac condition. Preoperative examination of extracardiac diseases may assist in correct risk assessment, allowing surgery to be conducted in better settings.

Conclusion

Balanced general anesthesia on cardiopulmonary bypass forms the basis of Anesthetic management of cardiac myxoma in the elderly patient. Complete preoperative assessment of elderly patients is a more appropriate approach in stable patients than the traditional emergency surgery applied to all cases. Intraoperative TEE guidance is up most desirable as it not only helps in the hemodynamic monitoring of the patient but also the direct visualization of the tumor mass during surgical removal. Finally, the multidisciplinary approach involving the surgeon, anesthetist, and cardiologist is required for better

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preoperative screening, perioperative risk management, and postoperative assessment for better patient outcomes.

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