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## ANAESTHETIC MANAGEMENT OF LARGE RETROPERITONEAL LIPOSARCOMA RESECTION IN A PATIENT WITH SEVERE MITRAL STENOSIS

Monal Ramani\*, Monisha Purkayastha, Mansi Jain, Mahesh Patel

B J Medical College, Asarwa, Ahmedabad, Gujarat 380016, India.

### ABSTRACT

A case of an elderly female with large retroperitoneal liposarcoma who is a known case of severe mitral stenosis who is posted for laparotomy. Liposarcoma is a malignant tumor of mesenchymal origin in which the bulk of tissue differentiates into adipose tissue. Most frequent in middle-aged and older adults (age >40y), liposarcomas are the second most common of all soft-tissue sarcomas. Mitral stenosis (MS) is characterized by obstruction to left ventricular inflow at the level of mitral valve due to structural abnormality of the mitral valve apparatus. Severe MS being MVA < 1 cm<sup>2</sup>. Anaesthetic management of a patient of liposarcoma with concurrent severe mitral stenosis should be comprised of adequate preoperative optimization using a multidisciplinary approach, careful monitoring, proper use of anaesthetic techniques and vigilant postoperative care.

**Key words:** Liposarcoma, mitral stenosis, epidural & general anaesthesia.

### INTRODUCTION

Liposarcoma is a common type of soft tissue sarcoma, which occurs most commonly in the extremities (52%), followed by there troperitoneum (19%) . Retroperitoneal liposarcoma is usually asymptomatic until the liposarcoma is large enough to compress the surrounding organs. It is often misdiagnosed due to its rarity and absence of symptoms [1]. In the experience of the authors, symptoms would only occur if the liposarcomapresses on the surrounding organs. However, the retroperitneumis a large space in which the retroperitoneal liposarcoma to grow. The symptoms of the tumor would not arise until the tumor grows to a certain dimension [2]. The management is surgical intervention. Even with complete removal of the liposarcoma, prognosis remains poor. The 5-year survival rate of well-differentiated retroperitoneal liposarcoma is 83%, while it is 20% for the dedifferentiated tumor subtype Retroperitoneal tumors commonly present with abdominal distension. Retroperitoneal location is the

second most common location followed by the lower extrimities. Liposarcoma is a rare type of cancer that begins in the fat cells. Liposarcoma is considered a type of soft tissue sarcoma. Most frequent in middle-aged and older adults (age >40y), liposarcomas are the second most common of all soft-tissue sarcomas. Annually 2.5 cases occur per million population. Liposarcoma scan occur in fat cells in any part of the body, but most occur in the muscles of the limbs or in the abdomen. Treatment for liposarcoma typically involves surgery to remove the cancer. Other treatments, such as radiation therapy, may also be used. Mitral valve stenosis — or mitral stenosis — is a narrowing of the heart's mitral valve. This abnormal valve doesn't open properly, blocking blood flow into the main pumping chamber of the heart (left ventricle). The main cause of mitral valve stenosis is an infection called rheumatic fever. Severe MS is mitral valve area (MVA)<1 sq. cm. Critical being<0.7 sq. Cm [3].

Corresponding Author :- **Monal Ramani** Email:- monalramani@yahoo.co.in

## CASE REPORT

A 60-year old female patient (weight 58kg, height 155cm) presented with complains on progressive abdominal distension & easy fatigability with occasional episodes of breathlessness along with loss of appetite & abdominal fullness since 3 months. She is a known case of mitral stenosis of severe grade with mitral valve area 1.0 sq.cm. The patient had also reported intermittent chest tightness, palpitations & feeling of headache prior to admission. She is a known hypertensive on regular medication of Tab. Amlodipine 5mg OD since 10 years. In pre-anaesthetic examination she had vital signs of temperature 36.5°C, Blood pressure 136/76 mmHg, Pulse rate 80/min of normal character, Respiratory rate 18/min. Patient was conscious, cooperative & well oriented. Airway was normal with Mallampatti grade I. On local examination the abdomen was enlarged, tense & dilated veins were seen over the abdomen [4].

Pre-operative laboratory tests were within normal limits. Hb- 10.5 gm/dl, platelet count- 3.46 lacs, Sr.urea-32gm%, Sr. creatinine- 1.3, Sr electrolytes-(Na: 128, K: 5.3), Total bilirubin: 0.52. ECG was normal but chest x-ray showed borderline cardiomegaly. 2D-ECHO reported EF- 55%, RVSP: 38 mmHg, AMVL thickening, MVA: 1.0 sq. cm, Severe MS with moderate MR (30%), Concentric LVH. Magnetic Resonance Imaging (MRI) showed large retroperitoneal myoma (? Liposarcoma) [5].

Upon arrival to the operation room she seemed anxious. Standard monitoring with electrocardiogram, non-invasive blood pressure, pulse oximetry were applied before the induction of anaesthesia. The preinduction vitals were PR: 100/min, BP: 140/86 mmHg, RR: 22/min, Temperature: 36°C. Patient was premedicated with Inj. Ondansetron 6 mg IV, Inj. Glycopyrrolate 0.2 mg IV and Inj. Fentanyl 100 ug IV. Epidural catheter was inserted with patient in lateral position under aseptic precautions. In the L3-L4 space epidural space was located at 4cm & the catheter was fixed at 9cm from skin. Inj. Tramadol 70mg was given through this catheter after negative aspiration [6].

Induction was done with Inj. Propofol 160mg IV & non-depolarising muscle relaxant Inj. Vecuronium 7mg IV after adequate preoxygenation with 100% O<sub>2</sub>. Patient was intubated & given controlled ventilation. Maintenance was done with sevoflurane, oxygen & nitrous oxide. After induction invasive blood pressure line was secured & monitoring was done to detect sudden lowering of BP. Total IV fluids during the surgery were given to maintain the blood pressure adequately with 500ml DNS, 500ml RL & 1 unit whole blood. The intraoperative period was uneventful. The patient

maintained vitals throughout the surgery well. After the total operative time of 1.5 hours, she was reversed with Inj Glycopyrrolate 0.4mg IV & Inj. Neostigmine 3.0mg IV. After the patient was fully awake, she was extubated with proper suctioning. Post extubation vitals were PR: 88/min, BP: 124/82 mmHg, RR: 20/min, Temperature: 35.8°C. The mean urine output was 120 ml/hr total being 300ml. Then shifted to post-anaesthesia care unit and was observed for 48 hours and analgesia was maintained with 8 hourly epidural doses. Patient was later shifted to ward [7].

## DISCUSSION AND CONCLUSION

Retroperitoneal tumor predominantly originates from fat, loose connective tissue, fascia, muscles, lymphatic tissue or residual embryonic tissue, of which 80% is malignant. Retroperitoneal liposarcoma is the most frequently observed subtype of retroperitoneal tumor, with an incidence of ~2.5 per million individuals. It usually occurs at 40–60 years of age, and the ratio between the genders is ~1:1. The large volume of the intra-abdominal space allows liposarcoma to grow without compressing the vital organs, resulting in rare early diagnosis. When clinical symptoms do present, the retroperitoneal liposarcoma has usually grown very large in size, oppressing or invading the surrounding organs.

To differentiate from other soft tissue tumors, auxiliary examinations are required, including ultrasonography, CT and MRI. Ultrasonography is usually selected prior to CT scan and MRI for its convenience. The final diagnosis of retroperitoneal liposarcoma is dependent on the pathological and immunohistochemical analyses. Liposarcoma can be histologically subdivided into 5 subtypes: Well-differentiated, myxoid, round cell, pleomorphic and dedifferentiated. With regards to the high recurrence rate of liposarcoma, the standardization of the original surgery becomes particularly important. Complete resection is the predominant treatment. The principle of the surgery is to resect the tumor and any invaded organs without any residue of the liposarcoma or membrane remaining. Successful complete resection of retroperitoneal liposarcoma may increase the 5-year survival rate from 16.7 to 58%. The 5-year survival rate of well-differentiated retroperitoneal liposarcoma is 83%, while it is 20% for the dedifferentiated tumor subtype. The goals for the anaesthetic management of patients with mitral stenosis are:

- (1) maintenance of an acceptable slow heart rate,
- (2) immediate treatment of acute atrial fibrillation and reversion to sinus rhythm,
- (3) avoidance of aortocaval compression,
- (4) maintenance of adequate venous return,
- (5) maintenance of adequate SVR and

(6) prevention of pain, hypoxaemia, hypercarbia and acidosis

This may increase pulmonary vascular resistance. There are no controlled studies examining the best type of anaesthetic technique in these patients and guidelines and standards are lacking. Therefore, individualizing the anaesthetic management according to the cardiovascular status and the practitioners' knowledge and experience of the existing treatment options is the key to success in these patients. One of the major advantages of epidural analgesia is that it can be administered in incremental doses and that the total dose could be titrated to the desired sensory level. General anaesthesia has the disadvantage of increased pulmonary arterial pressure and tachycardia during laryngoscopy and tracheal intubation. Moreover, the adverse effects of positive-pressure ventilation on the venous return may ultimately lead to cardiac failure. Despite these disadvantages, if general anaesthesia is contemplated, tachycardia, inducing drugs like atropine, ketamine, pancuronium and meperidine, should be totally avoided. A beta-adrenergic receptor antagonist and an adequate dose of opioid like fentanyl should be administered before or during the induction of general anaesthesia. Because esmolol has a rapid onset and short duration of action, it is a better choice in controlling tachycardia. Maintenance of anaesthesia can be carried out with oxygen and nitrous oxide 50:50, isoflurane, opioids and vecuronium. With associated severe pulmonary hypertension, nitrous oxide can be omitted. At this juncture, invasive haemodynamic monitoring is an inevitable guide.

In the present case adequate hemodynamic control was the prerequisite. As the patient is having cardiac pathology as severe MS. Due to this fixed output condition maintenance of intravascular volume

along with mean arterial pressure is required. Invasive BP monitoring was done to ensure proper blood pressure monitoring & hence renal perfusion. Induction was done with propofol & NMDR. Etomidate can also be used as an induction agent in this condition. Tachycardia is also to be avoided as the patient is a case of MS. Hence, pain, lighter plane of anesthesia, hypovolemia, stress are to be avoided. Epidural anaesthesia acts synergistically in this situation to alleviate pain & reduce the overall requirement of anaesthetic drugs & inhalational agents. The intraoperative Urine output was adequate suggesting adequate perfusion throughout the intra-operative time.

Atrial fibrillation commonly accompanies MS and is more related to age than to stenosis severity. When AF occurs acutely, it is often associated with a rapid ventricular response. Because increased heart rate primarily reduces time in diastole, the arrhythmia causes further impairment in left ventricular filling, which leads to abrupt left atrial hypertension and reduced cardiac output. Immediate rate control is imperative and can be effected by administration of  $\beta$ -blockers or rate-affecting calcium channel blockers. If these therapies are ineffective in controlling rate and the patient is unstable, immediate DC cardioversion is indicated. The patient with MS in chronic AF is at risk of embolic stroke (at a rate of between 7% and 15% per year). Accordingly, all such patients require warfarin anticoagulation with a target international normalized ratio of 2.5 to 3.5.

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**CONFLICT OF INTEREST:**

The authors declare that they have no conflict of interest.

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