

Anaesthetic management of excision of Olfactory Groove Meningioma by Bifrontal Craniotomy with Severe Mitral stenosis

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Abstract

The administration of anaesthesia for valvular heart diseases and perioperative care is unavoidable for every anaesthesiologist in their practice because of increased incidence of heart disease patients coming for non cardiac surgery. Patients with valvular heart diseases coming for non cardiac surgery pose many challenges to the anaesthesiologists. We managed the case of one such patient with severe mitral stenosis having olfactory groove meningioma that underwent bifrontal craniotomy without uneventfully events in the perioperative period and discharged from the hospital after 8 days in good physical health.

Keywords: Mitral Stenosis, Olfactory Groove Meningioma, Bifrontal Craniotomy, Atrial thrombus

1. Introduction

Advances in technologies, drugs and perioperative haemodynamic care have greatly benefitted patients with heart diseases. Patients with valvular heart diseases coming for non cardiac surgery have been considered as one of the most challenging in anaesthesiology practice. Among the cardiac diseases, mitral valve stenosis is one of the common cardiac problems in third world countries facing the problems in anaesthesiology practice.

Mitral Stenosis is almost always rheumatic in origin. Pure MS occurs in 25% of patients who develop long term Rheumatic Sequelae[1]. So far no single anaesthetic technique or drug is proposed to be the modality of choice in these patients. The anaesthetic plan needs to be individualized according to the patient's general condition, cardiac status, severity of mitral stenosis with complications, duration of surgery and type of surgery[2].

2. Case Report

We report the case of one such patient with severe mitral Stenosis having Olfactory groove meningioma that we managed for bifrontal craniotomy. A 40 years old lady weighing 55kgs, admitted in neurosurgery department with complaints of severe head ache, vomiting and loss of

consciousness for 5 days. She was diagnosed to have Olfactory groove Meningioma for which she was posted for Bifrontal craniotomy. She had a history of chronic rheumatic heart disease with severe mitral Stenosis. For that she has been on tab. Atenolol 25mg OD, Tab. Amiloride- 2.5mg + Tab. Frusemide 20mg OD. She was referred to cardiology department for further evaluation and Possibility of Percutaneous Balloon Mitral Valvotomy. The cardiologist refused to do interventional PBMV because of suspicion of Atrial thrombus[3].

On examination her general condition and airway were normal. CVS examination revealed a loud first heart sound, mid diastolic murmur in mitral area, and loud P₂. Her respiratory system was normal. X-ray showed Lt. Atrial enlargement with RVH changes. ECG showed normal sinus rhythm with P mitrale in V₁ lead. ECHO Cardiography findings showed critical Mitral Stenosis with valve area of 0.9cm², mild MR, mild TR with severe PAH and normal LV systolic function with doubtful Lt. atrial appendage thrombus. The pressure gradient across mitral valve was PPG-32 mmHg, & MPG -11 mmHg. MRI brain revealed features highly suggestive of skull base meningioma involving anterior cranial fossa with mass effect. High risk

consent was taken before day. All other investigations were within normal limits. Case was accepted for anaesthesia under ASA Gr III.

2.1 Anaesthetic Management

Patient was pre-medicated with Tab. Atenolol 25mg, Tab. Amiloride- 2.5mg+ Tab. Frusemide 20mg and Diazepam 10mg and antibiotics for endocarditis prophylaxis a night prior to surgery.

Patient was shifted to operating room. Monitors SPO₂, NIBP, temperature probe & ECG connected and base line values recorded. IV line secured with 16G cannula after infiltration of local anaesthetic, Ringer lactate started at the rate of 1 ml/kg./min. Inj. Midazolam 2mg, Inj. Fentanyl 2mcg/kg and Inj. Glycopyrrolate 0.2mg IV given. Left radial artery cannulated with 22G canula and Rt. Internal jugular vein cannulated with 7 Fr triple lumen catheter after local anaesthetic infiltration of aseptic precautions. Pre oxygenation was done for 5 minutes and anaesthesia induced with incremental doses of Thiopentone to a total of 100mg titrating to Arterial Blood Pressure. Muscle relaxation achieved with Inj. Vecuronium 6mg IV. Endotracheal intubation done with 7.5 size cuffed oral endotracheal tube and anaesthesia was monitored and maintained with O₂: N₂O – 50:50 ratio. Tidal volume and respiratory rate were adjusted so that ETCO₂ was maintained between 25-30mmHg. Top up doses of Inj. Vecuronium and Inj. Fentanyl were given as per requirement. Nasal temperature was maintained around 34⁰C intra operatively. All the vitals were carefully monitored and maintained within the range of 10% of their pre operative values throughout the surgery especially so when Inj. Mannitol was administered. IV fluids were titrated to CVP and urine output. Duration of surgery was 7 hours and at the end residual neuro muscular blockade was reversed at Inj. Neostigmine 2.5mg and Inj. Glycopyrrolate 0.5mg. Patient was re-warmed using bair hugger Model 500/OR. Recovery was adequate and extubation was uneventful. Patient was shifted to surgical ICU for post operative monitoring and further management with O₂ mask. She was discharged after 8 days in good physical health.

3. Discussion

Despite Pharmacological and medical advances in the past 20 years, the incidence of Mortality and Morbidity in critical cardiac patients for non cardiac surgery is still very high. Patients with pulmonary hypertension will develop right heart strain and consequently become extremely sensitive to reductions in preload and increases in pulmonary vascular resistance.

A careful preoperative clinical examination involving a proper assessment of functional status along with investigations to know the mitral valve status and pressure gradient across the mitral valve is critical to design a good anaesthetic plan. Haemodynamic variations are not at all compatible with fixed output conditions like Mitral Stenosis. Extreme care should be taken to maintain sinus rhythm and to avoid rapid ventricular rate, hypotension and fluid overload[4].

Craniotomy for any space occupying lesion in brain poses an increased risk in patients with mitral Stenosis. This is because use of osmotic diuretics like Mannitol to decompress the brain can cause a sudden transient increase in the preload because of the fluid shift into the intravascular compartment. So, this has to be done slowly and gradually titrating the dose carefully to CVP. Major blood loss is also a significant factor in craniotomies which can pose a constant threat of hypotension and arrhythmias leading to low cardiac output. So, continuous arterial blood pressure and CVP monitoring is very useful in promptly recognizing and managing haemodynamic insults.

This case presented with a unique challenge as the patient has fixed low cardiac output state. The cardiac event incidence in the patient with cardiac disease undergoing non cardiac surgery is 1-1.5%[5]. The risk of cardiac events depends on the severity of cardiac disease and the surgery. When the mitral valve area is reduced to less than 1 cm², there will be an increase in the left atrial pressure (required to push blood through the stenotic valve). Since the normal left ventricular diastolic pressures is less than 5mmHg, a pressure gradient across the mitral valve of 20 mmHg due to severe mitral Stenosis will cause a left atrial pressure of about 25 mmHg[6].

Pulmonary capillary pressures in this level cause an imbalance between the hydrostatic pressure and the oncotic pressure, leading to extravasations of fluid from the vascular tree and pooling of fluid in the alveoli (congestive heart failure pulmonary edema). So intraoperative blood loss and fluid management must be carefully titrated in these patients who are susceptible to volume overload and pulmonary edema due to Mannitol infusion[7]. In this case we monitored central venous pressure continuously, assessed blood loss and titrated infusion of fluids and blood.

4. Conclusion

The administration of anaesthesia for valvular heart diseases and peri operative care is unavoidable for every anaesthesiologist in the

practice because of increased incidence of valvular heart diseases. Assessment of functional status of the patient, severity of the valvular heart disease, risk of the surgical procedure, surgical manipulation, level of stress, and optimizing the hemodynamics irrespective of severity of the disease, anaesthesia procedure and duration of surgery is most important to manage this type of cases. Prior planning, anticipation and management of complications are most important than depending on drugs, techniques, monitors and machine to handle these type of cases.

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