

Case Report

Sphenoid Wing Meningioma with Rheumatic Heart Disease- Challenges and Management - Case Report

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Abstract

Management of sphenoid wing meningioma is a big challenge not only for the neurosurgeon, for the anesthesiologist also. It requires extensive preoperative work up and assessment, on toe intraoperative monitoring with quick response skills and effective postoperative care.

The issue becomes more complicated when it was associated with some associated comorbid condition like valvular heart disease compromising cardiovascular reservoirs of the individual.

Here we are discussing a patient of medial sphenoid wing meningioma with mitral stenosis with mitral regurgitation not in failure.

INTRODUCTION

Management of sphenoid wing meningioma poses a big challenge not only for the neurosurgeon, for the anesthesiologist also. It requires extensive preoperative work up and assessment, on toe intraoperative monitoring with quick response skills and effective postoperative care.

The issue becomes more complicated when it presents with some associated comorbid condition like valvular heart disease which compromises the cardiovascular reservoirs of the individual.

Here we are discussing a patient of medial sphenoid wing meningioma with mitral stenosis with mitral regurgitation not in failure.

CASE REPORT

A 35 year old female, a known case of rheumatic heart disease with mitral stenosis and mitral regurgitation was referred to our department from peripheral hospital with a history of headache and diminution of vision in her left eye for last one month. On examination, her general condition was fair, vitals stable. Except for the generalised diminution of vision, no other positive finding was recorded.

On imaging, there was an extra axial mass seen in right frontotemporal region (8x9x9 cm) which was isointense to grey

matter of brain on T1 sequence of MRI, hyper intense to brain parenchyma on T2, with brilliant contrast enhancement. There was broad attachment to medial wing of sphenoid on right side to midline. It was causing a mass effect and pushing the brain tissue resulting in subfalcine herniation. Ipsilateral ventricles were effaced.

Her cardiac evaluation revealed that she had dyspnea of NYHA Class III. She was found to have loud S1, mid diastolic murmur and opening snap on auscultation. ECG demonstrated bifid p waves in lead II with right ventricular strain pattern. 2 - D echo revealed moderately severe MS (MVA 1.2 cm²), trivial MR, mild TR, soft thrombus at tip of left atrium and LVEF 55%.

Patient was diagnosed as medial sphenoid wing meningioma with valvular heart disease with mitral stenosis not in failure.

After screening of routine blood biochemistry, the patient was planned for surgery, i.e. right frontotemporal craniotomy with excision of mass. Standard ASA monitoring guidelines were applied. Dopamine, epinephrine and NTG infusions were kept ready. Central venous and radial artery cannulations were done under LA. Invasive arterial monitoring (including ABG analysis at regular intervals of 30 minutes) and CVP monitoring were done. BIS was used to monitor depth of anaesthesia. Intravenous premedication with Ranitidine 100mg + Metoclopramide 10mg + Glycopyrrolate 0.2mg + Midazolam 2mg + Fentanyl 100 mcg was

given. Anaesthesia was induced using Thiopentone in sleep dose. Vecuronium bromide (0.14mg/kg) was used for intubation. During the whole surgery, controlled mechanical ventilation with O₂:N₂O::50:50 was used to achieve a target ETCO₂ value of 25 to 30 mm Hg. Anaesthesia was maintained with BIS – guided propofol i.v. infusion. Muscle relaxation was continued using vecuronium i.v. infusion at the rate of 1 µg/kg/min till completion of dural closure. Continuous monitoring of HR, SPO₂, ECG, ETCO₂, temperature, arterial BP, CVP, ABG parameters & urine output was done. Incremental dosage of fentanyl was used intraoperatively to maintain analgesia.

Intraoperative pulse rate was maintained between 70 – 80 /min. and bp was maintained as close to the baseline as possible. CVP was maintained around 7 cm H₂O. Input output monitoring was done vigilantly. Fluid and blood transfusion was done accordingly with the target to avoid any hypervolemia or hypovolemia. Sodium valproate was used instead of phenytoin as the patient was allergic to phenytoin. The surgery lasted for about eight hours. Recovery was smooth, extubation uneventful and the patient was shifted to ICU for postoperative care.

DISCUSSION

Approximately 25% of patients with rheumatic heart disease manifest with pure mitral stenosis, while an additional 40%, have a combination of mitral stenosis and regurgitation [1]. Any surgery undertaken in patients with mitral valve disease is considered risky. Skinner and pearce studied 111 patients with rheumatic heart disease undergoing noncardiac surgery and found mortality rates of 6% and 10% for mitral and aortic valve disease, respectively [2]. The American College of Cardiology / American Heart Association (ACC/AHA) task force on practice guidelines suggested that severe valvular disease is considered a major clinical predictor of cardiac risk. The authors also defined the cardiac risk stratification for noncardiac surgery depending on the type of surgery and degree of hemodynamic stress. They divided the patients into high, intermediate, and low risk groups; brain surgery was considered as having a high surgery-specific cardiac risk (>5%) [3,4]. The management of mitral valve disease before neurosurgery and the timing of surgery are important considerations. The ACC/AHA guidelines suggest that in the presence of severe valvular disease, one may have to delay or even cancel the proposed noncardiac surgery and subject the patient to further cardiovascular testing [3,4]. Specific guidelines for preoperative cardiovascular evaluation for noncardiac surgery have been proposed, and they include cardiac testing such as echocardiography and cardiac catheterization. Regurgitant valve lesions are better tolerated perioperatively and may be stabilized with intense medical therapy and monitoring [5]. Surgery for intracranial tumors has its own surgical and anesthetic complications. Perioperative hemodynamic instability in such patients may manifest as bradycardia, hypotension, or hypertension and arrhythmia. Neurosurgical procedures tend to be lengthy and may be associated with massive blood loss. They require unusual positioning of the patient and institution of special techniques to facilitate surgery such as hyperventilation, cerebral dehydration, and deliberate hypotension. In patients with cardiac disease, osmotherapy or hyperventilation may compromise cardiac function [6]. Such patients must be medically

optimized, and appropriate monitoring should be used. Thus, it is likely that surgery for an intracranial lesion in combination with valvular heart disease compounds the risks. For the intracranial lesion, one would require maintenance of intracranial pressure despite loss of autoregulation and prevention of brain edema to optimize surgical exposure. Maintenance of hemodynamic stability during surgery, particularly at the time of induction, and rapid recovery postoperatively to assess the neurologic status are also required. Positioning and prevention of fluid and electrolyte disturbances are also important considerations for intracranial surgery. For mitral valve disease (combined mitral stenosis and regurgitation), our main aim would be maintenance of stable hemodynamics with optimal preload, controlled heart rate, and normalization of afterload. Hypoxia, hypercarbia, hypothermia, and acidosis must be avoided [6]. The role of narcotics in neurosurgery, especially for space-occupying lesions, and the effect on intracranial pressure have been described. According to michenfelder [7], narcotics, when administered in large doses, probably cause a modest decrease in both the cerebral metabolic rate for oxygen and the cerebral blood flow. In neurosurgical procedures the importance of hemodynamic stability is utmost at the time of induction as well as extubation. Positioning for sphenoid wing meningioma surgery has an important bearing on the hemodynamics of the patient. The sitting position is the favored position in our institute as it provides excellent surgical exposure, improved venous drainage, and access to the endotracheal tube. However, it also decreases the stroke volume and cardiac output by 12% to 20%, increases pulmonary and systemic vascular resistance by 50% to 80%, and decrease cerebral perfusion pressure by 15% to 20%. Moreover, the chance of venous air embolism is 25% to 40% compared with the lateral (8.3%) and the prone position (10%) [8]. Thus, in this patient, surgery was performed in the lateral position, where the chances of hypotension and venous air embolism would be expected to be less. Another major consideration for meningioma surgery is the requirement for induced hypotension to decrease intraoperative blood loss. However, induced hypotension should be avoided in patients with valvular heart disease, as further hemodynamic deterioration can occur, which may lead to delayed awakening, cortical ischemia, and impairment of higher functions. The highlights of the perioperative management of this patient with mitral valve disease who underwent sphenoid wing meningioma surgery included use of narcotics at induction, lateral positioning for surgery, readily available inotropes, prompt treatment of hypotension, invasive monitoring, etc. So far in the medical literature there is no case report on the anesthetic management of sphenoid wing meningioma surgery in patients with preexisting mitral valve disease. A thorough preoperative evaluation and optimization and a good technique that balances the anesthetic requirements of both the cardiac and the neurologic disease helps in achieving a successful outcome.

REFERENCES

1. Braunwald E. Valvular heart disease. In: Heart disease, Braunwald E, editor. Philadelphia: WB Saunders. 1992.
2. Skinner JF, Pearce ML. Surgical Risk in the Cardiac Patient. J Chronic Dis. 1964; 17: 57-72.
3. Eagle KA, Chaitman BR, Fleishmann KA, et al. Acc/aha guideline

- update for perioperative cardiovascular evaluation for non-cardiac surgery: executive summary. *Anesth analg*. 2002; 94: 1052-1064.
4. Eagle KA, Brundage BH, Chaitman BR, Ewy GA, Fleisher LA, Hertzner NR, et al. Guidelines for perioperative cardiovascular evaluation for noncardiac surgery. Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee on Perioperative Cardiovascular Evaluation for Noncardiac Surgery). *J Am Coll Cardiol*. 1996; 27: 910-948.
 5. Reyes VP, Raju BS, Wynne J, Stephenson LW, Raju R, Fromm BS, et al. Percutaneous balloon valvuloplasty compared with open surgical commissurotomy for mitral stenosis. *N Engl J Med*. 1994; 331: 961-967.
 6. Bando AA. Anaesthesia for neurosurgery. In: Barash PG, Cullen BF, editors. *Clinical anesthesia*. Philadelphia: lippincott-raven. 1997; 699-746.
 7. Michenfelder JD. The cerebral circulation in: Prys Roberts C, ed. *Anaesthesia: applied physiology & pharmacology*. Oxford: blackwell scientific publications; 1980; 209.
 8. Milde LN. The head-elevated positions. In: *Positioning in anesthesia and surgery*, Martin W, editor. 3rd ed. Philadelphia: Saunders WB. 1997: 71-93.

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