



**ORIGINAL RESEARCH PAPER**

**Medical Science**

**ANAESTHETIC MANAGEMENT OF PATIENT WITH PROSTHETIC HEART VALVE AND SCOLIOSIS POSTED FOR CHOLECYSTECTOMY : A CASE REPORT**

**KEY WORDS:** prosthetic heartvalves,scoliosis,anticoagula nts,cholecystectomy

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**Introduction**

Prosthetic heart valves are usually placed on a patient by replacing the diseased valves. After valve replacement surgery they are started on anticoagulants and continued so as to prevent thrombus formation which places challenges both to anesthesiologist and the surgeons when they are posted for surgery. Management of these patients involves cardiac assessment for valvular function, residual pathology, infective endocarditis and functional status; assessment of the status of anticoagulation, any risk of bleeding, preparation for reversal of anticoagulants if needed intraoperatively; and neurological evaluation for detecting any impairment due to thromboembolism<sup>1</sup>.

Adding to these challenges are if the patient is associated with other co morbidity.

We hereby report a successful management of a patient with prosthetic heart valve and scoliosis posted for cholecystectomy.

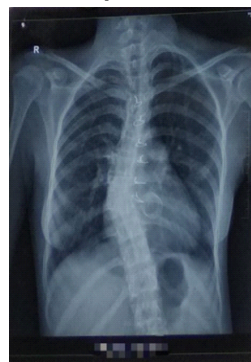
**CASE PRESENTATION:** A 24-year-old female, a known case of rheumatic heart disease with severe ms and severe mr , who had undergone a successful mitral valve replacement surgery on 2012, had come with complaints of pain abdomen. Her usg whole abdomen revealed chronic calculus cholecystitis. Her past history revealed that prior to the valve replacement she used to get breathless even while doing routine daily activities. Presently, she could climb two flights of stairs without any syncope, palpitations, fatigue, chest pain or breathlessness. She was receiving oral warfarin 3 mg once daily. Physical examination revealed her to be afebrile, with pulse-102 beats per minute, respiratory rate 18 breaths per minute and blood pressure 104/63 mmHg. Her spine examination revealed scoliosis towards left side. Patient's electrocardiogram showed sinus rhythm with 78 beat per min with widespread T wave abnormalities. Her ECHO showed post more, trace mr, normal functioning PHV at MV position, normal LV function, mild PAH with ejection fraction 55%, and Confirmed absence of vegetations, clots and pericardial effusion. The chest X ray revealed mitral valve prosthesis, sternotomy sutures and cardiomegaly (Fig 1).

Her routine investigation reveals - hb 12.4g%, platelets 330000, aPTT 35.7sec. PT -32.9 sec INR-3.13. Cobb's angle in the thoracolumbar spine was 50.3°, severe grade. PFT indicates mild restrictive lung disease. Other reports were within normal limits. Pre op preparation includes stoppage of warfarin and switching over to heparin, to achieve a target of 2\* normal aPTT. patient was advised to discontinue warfarin for five days, was then started on inj heparin 2500u iv TDS. daily APTT was done. The dosage was further increased to 5000u iv TDS. Pulmonologist opinion regarding scoliosis and its impact on respiratory system was taken for documentation

and better patient preparation. Considering the above findings patient was planned to for open cholecystectomy.

On the day of surgery, the last dose of heparin was administered 6 h prior to surgical incision and the coagulation studies prior to starting the surgery revealed PT 14.1 (patient) and 13 (control) with a INR 1.2, APTT 56 (patient) and 33 (control). Two units of packed red blood cells, Fresh frozen plasma and protamine were reserved for emergency use in case of undue blood loss during the surgery. she was kept nil per oral as per the standard guidelines. She received ampicillin 1.5 g and gentamicin 80 mg intravenously as infective endocarditis prophylaxis 30 minutes prior to skin incision. General anesthesia was planned. Apart from the standard monitoring, invasive blood pressure monitoring was also instituted. Patient was induced with fentanyl 80 mcg, xylocard 2ml, propofol 80 mg in titrated dose to induce sleep. patient intubated using rocuronium 40 mg. Anesthesia was maintained with mixture of oxygen and Desflurane. Neuromuscular blockade was maintained with rocuronium.

There was minimal blood loss which was replaced with crystalloids. For analgesia, inj pcm 1g iv and sub costal TAP block was given using 0.2 % ropivacaine. Anesthesia was smooth and uneventful. total duration of surgery was 1 hour 35 minutes. After tracheal extubation the patient was shifted to high dependency unit for monitoring. Patient was re started On heparin next day. After 48 hours, she was also started on warfarin and PT and APTT were repeated daily. By fourth day heparin was stopped and warfarin continued as before, when target INR was achieved ( more than 3). She was discharged home on 5th day.



**DISCUSSION**

We had two major problems - prosthetic mitral valve, scoliosis. The goals for anaesthetic management were prevention of thrombosis, prevention of infective endocarditis, adequate analgesia, maintenance of normovolemia and lung protective ventilation.

Patients with prosthetic heart valves are exposed to a Significant threat of thromboembolism and valve dysfunction if proper anticoagulation is not achieved. This presents a tricky situation as discontinuation of anticoagulation in the perioperative period can precipitate life-threatening thromboembolism whereas continuation may cause Significant bleeding during surgery<sup>1</sup>. The prosthetic valve itself may get occluded by thrombus. Due to high risk of hemorrhage, the INR should be within the normal range before the procedure. In patients with heart valves, both the European Society of Cardiology and the Fourth American College of Chest Physicians Consensus Conference on Antithrombotic Therapy have recommended perioperative heparinization to minimize the risk of thrombosis resulting from the return to a normal INR. A dose of heparin should be given 3–6 h preoperatively in patients at high risk of thromboembolic events and heparin should be restarted as soon as possible post-operatively (preferably within 12 h)<sup>2</sup>. Warfarin is restarted 24 hours postoperatively or when patients can start oral intake. Heparin should be continued till the INR is in the therapeutic range for at least 48 h, to enable a reduction in all the vitamin-K-dependent clotting factors. In emergency surgery, the effect of warfarin needs to be neutralized by FFP, the dose of which depends upon the individual and this is titrated till INR < 1.5. In addition to this, vitamin K may also be given intravenously in small doses as large doses may lead to resistance to warfarin when it is restarted following surgery.

Warfarin bridging - it confers an increase in both major bleeding and major cardiovascular events, but without an appreciable decrease in thromboembolic events. Currently, the following key points are widely endorsed:

- (i) Warfarin should not be interrupted for procedures of low bleeding risk.
- (ii) Patients at low risk of VTE should not be bridged.
- (iii) In patients at highest risk of VTE, but not excessive bleeding risk, bridging should be considered.
- (iv) Intermediate-risk cases should be considered on an individual patient basis, with the risk of bleeding vs risk of VTE assessed<sup>3</sup>. The risk of sustaining a perioperative thrombotic event is divided into three pathological groups (i) Mechanical heart valve (MHV); (ii) AF; and (iii) previous/risk of VTE. Mechanical mitral valves are considered high risk, whereas aortic valves are categorised by type.

Scoliosis is a lateral curvature and rotation of the thoracolumbar vertebrae with a resulting rib cage deformity. It may be idiopathic or secondary to neuromuscular disease, infection, tumour or injury. Adolescent idiopathic scoliosis is the most common form of scoliosis, more frequent in girls. In most cases the curvature remains small or may even resolve. However, if spinal curvature progresses, there is an increase in cosmetic deformity, back pain and chest cavity narrowing. More severe curves result in a restrictive lung defect and dyspnoea on exertion (>65°). Uncorrected progression leads to respiratory failure, pulmonary hypertension and right heart failure (>100°). Surgery is indicated once the curvature is >40°<sup>4</sup>.

A restrictive lung defect attributable to scoliosis compounds the respiratory weakness associated with neuromuscular disease. Surgery may slow the decline in respiratory function and improve quality of life by improving posture and helping nursing care

The aetiology, location and degree of scoliosis should be noted and require a full history, physical examination and appropriate investigations focusing on cardiovascular and respiratory systems. Spirometry is performed routinely on all patients which usually show a restrictive lung defect.

Preoperative assessment of patients with neuromuscular disease or immobility is more difficult. They may be complicated by subclinical Cardiomyopathy<sup>4</sup>. Any reduction in ejection fraction may mean difficulties coping with the rapid fluid shifts during surgery.

### CONCLUSION

There is a special need to monitor the anticoagulation in patients with prosthetic heart valves by weighing the risk and benefit of stopping and continuing it according to the type of surgery. Therefore, a thorough preoperative assessment, optimizing the cardiac status, proper anesthetic plan, intraoperative and postoperative monitoring and prompt recognition and management of complications

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