

Anesthetic management of cor pulmonale posted for fracture neck femur: Role of regional anesthesia

Nikhil Mudgalkar,^a Shrikant Panachal,^b Jogenpalli Ashwin^b

^aAssociate Professor, Department of Anesthesia, ^bAssistant Professor, Department of Anesthesia, Prathima Institute of Medical Sciences, Karimnagar, Andhra Pradesh, India.

Address for correspondence: Dr. Nikhil Mudgalkar, Associate Professor, Department of Anesthesia, Prathima Institute of Medical Sciences, Karimnagar, Andhra Pradesh, India.

Email: drniks2000@yahoo.com

ABSTRACT

Introduction: Patients with Cor pulmonale pose a difficult challenge for the anesthesiologist.

Case report: We present a case of 75 year old female with cor pulmonale with fracture left femur posted for Austin Moore prosthesis. Regional anesthesia with invasive haemodynamic measurement was done with successful perioperative management.

Discussion: proper understanding of pathophysiology, preoperative optimization of the patient,

invasive cardiovascular monitoring and avoidance of factors raising pulmonary artery pressure are keys of successful management.

Conclusion: In a subset of patients who do not have left ventricular dysfunction secondary to cor pulmonale, regional anesthesia is an option but should be guided by invasive haemodynamic data.

Key words: Cor pulmonale, fracture neck femur, regional anesthesia

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INTRODUCTION

Patients with cor pulmonale presenting for surgery pose challenging scenarios for anesthesiologist. Patients are at increased risk for perioperative complications. We present a case of 75 year old lady with cor pulmonale for fracture left femur posted for Austin Moore prosthesis.

CASE REPORT

A 75 year old female was admitted with a history of fracture left femur. There was history of fall one day ago. She was a known case of bronchial asthma and chronic obstructive pulmonary disease from last 10 years with intermittent treatment of bronchodilators, nebulizers. On admission she was having NYHA class IV dyspnoea, occasional wheeze and rhonchi. On admission, she was evaluated by a pulmonologist and cardiologist and was found to have cor pulmonale. The echo revealed dilated right atrium, right ventricle, right ventricular systolic and diastolic dysfunction with good left ventricular function and elevated pulmonary artery pressure, with estimated pulmonary artery pressure around 52 (severe pulmonary hypertension). X ray revealed prominent pulmonary vasculature. Electrocardiogram revealed right ventricular as well as right

atrial hypertrophy. She was kept in intensive care unit and was stabilized with oxygen supplementation, antibiotics, nebulizers, and bronchodilators along with diuretics. After 4 days, she felt symptomatically better and dyspnoea reduced to NYHA class II and she was posted for surgery.

On the day of surgery, the patient was conscious and coherent, with pulse rate of 92/minute, blood pressure of 140/70 mm of Hg, saturation of 95 % on air, respiratory rate of 14/minute with all routine investigations within normal limits (Hemogram, Liver function tests, kidney function tests, blood sugar levels). The patient was kept on the operation table and under local anesthesia 16 gauge Intravenous canula, left sided radial canula was done along with 7 french 16 cm triple lumen central venous catheters. All invasive monitors were connected to the monitoring lines. It was decided to do the case under regional anesthesia in view of good left ventricular systolic function. Preloading was done with 750 ml of ringer lactate solution. Under all aseptic precautions 25 gauge spinal needle was introduced in L3-L4 interspace and after the free flow of the CSF was achieved, spinal anesthesia was

given with 3.5 ml of 5% bupivacaine. Patient was kept supine immediately. Within 5 minutes a level of T10 was achieved with moderate falls in blood pressure of 140 systolic to 110 systolic. Pressure was maintained in the same range throughout the procedure. Central venous pressure was maintained in between 6 – 8 with judicious use of ringer lactate solution. Injection nitroglycerine infusion was put at a rate of 1 ml/hour (25 mg/50 ml through syringe pump) to keep pulmonary artery pressure low. The Austin Moore prosthesis was done in lateral position. The procedure was over within 40 minutes with blood loss of around 100 ml. Intraoperative vitals were stable; the patient was shifted to the intensive care unit under monitoring. After 4 hours, analgesia was maintained with paracetamol infusion and tramadol. Patient went fine and discharged from the hospital on 7th postoperative day.

DISCUSSION

Cor pulmonale is the alteration of right ventricular structure or function that is due to pulmonary hypertension caused by diseases affecting the lung or its vasculature. Right-sided heart disease from primary disease of the left side of the heart or congenital heart disease is not considered.¹ The signs and symptoms of PH are nonspecific and subtle. Left untreated, patients will experience progressive symptoms of dyspnoea and right heart failure culminating in markedly curtailed survival.² Surgery for patients with PH is associated with significant morbidity and mortality regardless of which anesthetic technique is utilized.^{3,4} A thorough history, clinical examination and all investigations (Hemogram, urine routine, liver function tests, kidney function tests, electrocardiogram, chest x ray, echocardiogram) and if required right heart catheterization should be considered. All the drugs should be continued except anticoagulants.

Right ventricle is a thin walled chamber, which fails easily if chronic pressure overload exists. So goals of intraoperative management include optimized pulmonary artery pressure, right ventricular preload, avoid right ventricular ischemia, and consequent failure. Factors which lead to increase in pulmonary artery pressure like hypoxia, hypercarbia, acidosis, hypothermia should be avoided. If the above goals are kept in mind and followed meticulously, the choice of anesthetic becomes less important.

We considered regional anesthesia as a method of choice in this patient as the left ventricular function was good as suggested by echocardiography. If left ventricular function is deranged, general anesthesia

is a more favorable option. So regional anesthesia may be considered the technique of choice in a subset of patients who do not have consequent left ventricular dysfunction. Moreover regional anesthesia may be beneficial in these subsets by reducing preload, it may improve right ventricular function. We did not put pulmonary artery pressure catheter in this patient as these patients are at higher risk of pulmonary artery rupture and chances of loss of atrial kick while the catheter is passing the right ventricle. These patients are dependent on properly timed atrial contraction for optimum preload.

These patients are also at risk of high mortality in the first 24 hours,⁵ and as the effect of anesthetic wears off, increased pulmonary artery pressure, right ventricular failure, and arrhythmias. Aggressive postoperative pain control as well as optimum fluid management is the key of good postoperative recovery.

CONCLUSION

Cor pulmonale is a difficult clinical problem to treat. Moreover anesthesia induces lots of pathophysiologic stress on various systems of the body which can complicate the disease process. Proper understanding of the pathophysiology of the disorder, proper preoperative optimization and meticulous care is must to successfully manage the patient in the perioperative period. In a subset of patients of cor pulmonale with good left ventricular function, regional anesthesia is an option and should be actively sought but under invasive cardiovascular monitoring.

REFERENCES

1. MacNee W. State of the art: Pathophysiology of cor pulmonale in chronic obstructive pulmonary disease (Parts 1 and 2). *Am J Respir Crit Care Med* 1994; 150: 833.
2. Gaine S: Pulmonary hypertension. *JAMA* 2000; 284:3160-8.
3. Martin JT, Tautz TJ, Antognini JF: Safety of regional anesthesia in Eisenmenger's syndrome. *Reg Anesth Pain Med* 2002;27:509-13.
4. Ramakrishna G, Sprung J, Ravi BS, Chandrasekaran K, McGoon MD: Impact of pulmonary hypertension on the outcomes of noncardiac surgery: predictors of perioperative morbidity and mortality. *J Am Coll Cardiol* 2005; 45:1691-9.
5. Burrows FA, Klinck JR, Rabinovitch M, Bohn DJ: Pulmonary hypertension in children: Perioperative management. *Can Anaesth Soc J* 1986; 33:606-28.