

CASE REPORT

ANESTHETIC MANAGEMENT OF A PATIENT WITH BICUSPID AORTIC VALVE AND HASHIMOTO'S THYROIDITIS POSTED FOR ABDOMINAL HYSTERECTOMY

RENUKA HOLYACHI, BASAVARAJ PATIL, SHIVANAND L. KARIGAR

ABSTRACT

Bicuspid aortic valve is the most common birth defect affecting the heart and is present in 1-2% of the population. The abnormal valve structure leads to turbulent flow, fibrosis, calcification, and aortic stenosis. Aortic stenosis increases perioperative morbidity and mortality. Anesthetic techniques that reduce systemic vascular resistance (regional neuraxial techniques) must be used with extreme caution. Hashimoto's disease or chronic thyroiditis or autoimmune thyroiditis is the most common cause of hypothyroidism in adults. Regional anesthesia is preferred in patients with hypothyroidism as recovery from general anesthesia may be delayed by hypothermia, respiratory depression, or slow drug biotransformation. This is a case report of anesthetic management of a middle-aged female with co-existing aortic stenosis, hypothyroidism, and fibroid uterus posted for abdominal hysterectomy.

Key words: Anesthesia, bicuspid aortic valve, Hashimoto's thyroiditis

INTRODUCTION

Bicuspid aortic valve (BAV) is a structural defect of the aortic valve, with prevalence of 2%.^[1-3] The normal aortic valve area (AVA) is 2.6-3.5 cm² in adults. Hemodynamically, significant obstruction occurs as the AVA approaches 1.0 cm². The consequent changes include left ventricle hypertrophy, diastolic dysfunction with a reduced compliance, and consequent left atrial hypertrophy.

Preservation of sinus rhythm is necessary for the maintenance of cardiac output. Left ventricular oxygen requirements increase with increased muscle mass.^[3-5]

Hashimoto's thyroiditis is the most common cause of hypothyroidism.^[6,7] It is associated with the risk of respiratory failure or insufficiency and increased bleeding perioperatively.^[8,9]

Department of Anaesthesiology, BLDEU's Shri BM Patil Medical College, Bijapur, India

Address for correspondence:

Dr. Renuka Holyachi,
Department of Anaesthesiology, BLDEU's Shri BM Patil Medical College, Bijapur - 586 103, India.
E-mail: renuka312@gmail.com

Access this article online

Quick Response Code:



Website:

www.indianjmedsci.org

DOI:

10.4103/0019-5359.110928

CASE REPORT

A 45-year-old female weighing 52 kg and height 160 cm was scheduled for abdominal hysterectomy. Patient had per vaginal bleeding since 6 months and diagnosed to be due to fibroid uterus.

The patient had history of thyroid swelling since 6 years, diagnosed as Hashimoto's thyroiditis and being treated with oral levothyroxine 100 µg/day. Pre-operatively, she was clinically euthyroid.

Patient had a history of chest pain, palpitations, syncope 2 years back. She was diagnosed to have aortic stenosis due to bicuspid aortic valve and was treated conservatively. She was taking tab. digoxin for 5 months and then stopped.

Her obstetric history included three living children, the youngest one being 18 year old. All the three were full-term vaginal uneventful home deliveries.

On examination, her pulse rate was regular, 70/min and, blood pressure was 120/70 mmHg in the right upper limb. Cardiac auscultation revealed an ejection systolic murmur in the aortic area, conducted to carotid. She was in New York Heart Association functional Class II. Thyroid swelling of 4 × 5 cm was visible in front of the neck. Routine blood and biochemical investigations were within normal limits. Her electrocardiogram (ECG) was normal. Pre-operative echocardiography showed bicuspid aortic valve with area of 1.9 cm², maximum aortic velocity of 3.8 m/s, and pressure gradient of 31 mmHg suggestive of moderate aortic stenosis.

Thyroid profile showed T3- 1.3 ng/ml (normal: 0.6-2 ng/ml); T4- 95 ng/ml (normal: 30-150 ng/ml); and Thyroid Stimulating Hormone]- 5.8 miu/L (normal: 0.6-6 miu/L). FNAC- (fine needle aspiration cytology) of thyroid swelling was suggestive of Hashimoto's thyroiditis.

The patient was kept fasting overnight. Levothyroxine was continued on the morning of surgery. Pre-medication was given with tab. ranitidine 150 mg the night before and on the morning of surgery. Pre-operatively, the patient was pre-medicated with inj. ondansetron 4 mg iv and inj. midazolam 1 mg iv. Routine monitors (ECG, automated non-invasive blood pressure, and pulse oximeter) were attached. Under aseptic precautions, in the left lateral position, 18 G Epidural catheter was placed in the T11-T12 interspace. Test dose was given with 3 ml of inj. lignocaine with adrenaline (1:2,00,000). After confirming for negative intrathecal and intravascular administration, epidural anesthesia was given with a combination of inj.lignocaine (2%) 5 ml and inj. bupivacaine (0.5%) 5 ml. 15 min later level of blockade upto T6 dermatome was achieved. Top-up dose of epidural was given after 1 h with inj. bupivacaine 0.5% 5 ml. Duration of surgery was 90 min. One liter of crystalloid was given intra-operatively. Intra-operative blood loss was 500 ml. Stable hemodynamics were maintained throughout the intra and post-operative periods. Post-operative analgesia was given with epidural inj. bupivacaine 0.125% 10 ml with inj. tramadol 75 mg thrice daily.

Patient was shifted to the intensive care unit for monitoring. Further ICU stay was uneventful

and the patient was shifted to the ward on the second day and discharged home on the seventh day.

DISCUSSION

Bicuspid aortic valve is the most common birth defect affecting the heart and is present in 1-2% of the population.^[1-3] There is fusion of one of the three commissures and the valve leaflets do not open adequately. Turbulence as the blood flows through the valve leads to valve damage, calcification, thickening, and incomplete opening. Valvular aortic stenosis results in chronic left ventricular pressure overloading.^[4] Compensatory concentric left ventricular hypertrophy allows the pressure-overloaded ventricle to maintain stroke volume with modest increases in diastolic pressure, and the patients remain asymptomatic for many years.^[5]

Careful hemodynamic monitoring is vital. Invasive monitoring is indicated in severe aortic stenosis or surgeries with hemodynamic fluctuations. Pulmonary artery catheterization is relatively contraindicated because of the risk of precipitating arrhythmias.^[2,3] Anesthetic techniques that reduce systemic vascular resistance must be used with extreme caution although successful cases of carefully titrated epidural and spinal blocks using catheters have been reported. Drugs to maintain the systemic vascular tone such as norepinephrine, phenylephrine, or metaraminol must be at hand. Maintenance of sinus rhythm and adequate intravascular volume is vital to ensure ventricular filling. Arrhythmias must be treated promptly. Tachycardia is detrimental as it reduces the diastolic time for myocardial

perfusion. Non-steroidal anti-inflammatory drugs should be avoided if possible as these patients will be at risk of post-operative renal dysfunction.^[3]

Hashimoto's thyroiditis is the most common cause of hypothyroidism. Severe, symptomatic hypothyroidism can cause myxedema coma, pericardial effusion, and heart failure.^[6,7] Perioperatively, hypothyroid patients are prone to drug-induced respiratory depression and aspiration due to delayed gastric-emptying. Blunted baroreceptor reflexes and decreased intravascular volume can lead to severe hypotension. Induction may be best accomplished with ketamine. Intubation may be complicated by a large tongue. Volatile anesthetics can lead to severe myocardial depression. Other potential problems include hypoglycemia, anemia, hyponatremia, and hypothermia from a low basal metabolic rate.^[8]

Recovery from general anesthesia may be delayed by hypothermia, respiratory depression, or slow drug biotransformation, and hypothyroid patients often require prolonged mechanical ventilation. Because of the risk for respiratory depression, opiates may need to be avoided in favor of NSAIDs (non steroidal anti inflammatory drugs) for post-operative analgesia. Regional anesthesia is preferred over general anesthesia.^[9]

CONCLUSION

The co-existence of aortic stenosis and hypothyroidism poses unique challenges in the perioperative period. Epidural anesthesia can ensure stable intra- and post-operative hemodynamics. It also provides post-operative

analgesia and avoids pain-associated adverse effects.

REFERENCES

1. Otto CM. Valvular stenosis: Diagnosis, quantitation, and clinical approach. In: Otto CM. Textbook of Clinical Echocardiography. 2nd ed. Philadelphia: WB Saunders Company; 2000. p. 229-64.
2. Sinha R, Garg R. Anesthetic management for laparoscopy surgery in a patient with residual coarctation of aorta and mild aortic stenosis. *J Anaesthesiol Clin Pharmacol* 2011;27:412-3.
3. Cannesson M, Earing MG, Collange V, Kersten JR. Anesthesia for noncardiac surgery in adults with congenital heart disease. *Anesthesiology* 2009;111:432-40.
4. Yuan SM, Jing H. The bicuspid aortic valve and related disorders. *Sao Paulo Med J* 2010;128:296-301.
5. Siu SC, Silversides CK. Bicuspid aortic valve disease. *J Am Coll Cardiol* 2010;55:2789-800.
6. Brent GA, Larsen PR, Davies TF. Hypothyroidism and thyroiditis. In: Kronenberg HM, Melmed S, Polonsky KS, Larsen PR, editors. *Williams Textbook of Endocrinology*. 11th ed. Philadelphia, Pa: Saunders Elsevier; 2008.
7. Farling PA. Thyroid disease. *Br J Anaesth* 2000;85:15-28.
8. Klein I, Ojamaa K. The cardiovascular system in hypothyroidism. In: Werner and Ingbar's editor. *The Thyroid: A Fundamental and Clinical Text*. 8th ed. Philadelphia: JB Lippincott Co; 2000. p. 777-82.
9. Stathatos N, Wartofsky L. Perioperative management of patients with hypothyroidism. *Endocrinol Metab Clin North Am* 2003;32:503-18.

How to cite this article: Holyachi R, Patil B, Karigar SL. Anesthetic management of a patient with bicuspid aortic valve and Hashimoto's thyroiditis posted for abdominal hysterectomy. *Indian J Med Sci* 2012;66:90-3.
Source of Support: Nil. **Conflict of Interest:** None declared.