

## **CASE REPORT**

# **An anesthetic encounter with an operated case of coarctation of aorta**

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### **ABSTRACT**

Coarctation of aorta is a connective tissue disorder, which accounts for a type of acyanotic congenital heart disease. A patient with surgically treated coarctation of aorta may present in adulthood with several cardiovascular and central nervous system problems which could pose considerable challenges in their anesthetic management. We present here our experience of the anesthetic and perioperative management of an operated case of coarctation of aorta taken up for inguinal herniorrhaphy.

**Key words:** Cardiovascular Abnormalities; Congenital Abnormalities; Coarctation of aorta;

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### **INTRODUCTION**

Coarctation of aorta accounts for 6% of congenital heart defects.<sup>1</sup> It typically occurs at the junction of the aortic arch and the descending aorta commonly distal to the left subclavian artery.<sup>2,3</sup> Surgical approaches for the treatment include resection of the coarcted area with direct end-to-end anastomosis of the aorta or aortoplasty with homograft or synthetic graft material.<sup>2</sup> With the steady increase in the number of Grown up Congenital Heart Disease(GUCHD) patients, they are increasingly presenting for coincidental surgical procedures to noncardiac surgical units.<sup>1</sup> It is thus very likely that an anesthesiologist can come across a surgically corrected case of congenital heart disease coming for non-cardiac surgery. Such a case still comes under high-risk category after operation.<sup>4</sup> Repaired coarctation is not a benign condition.<sup>5</sup> Following surgical repair, several sequelae and risks exist for the patient depending on the age at correction and intervention performed.<sup>2</sup> We report here our experience of anesthetising a case of post coarctation surgical repair for inguinal hernia surgery.

### **CASE REPORT**

A 34 year male came with a history of swelling in the right groin. He was diagnosed with severe coarctation of aorta (CoA) distal to the left subclavian artery for which

he underwent surgical repair using 14mm Haemashield graft 10 years back. He was not on any anticoagulants or antihypertensive medications. The physical examination revealed a left thoracotomy scar (Figure 1), no murmurs, a good volume pulse in the range of 75-80 beats per minute in both upper and lower limbs. A systolic blood pressure (SBP) in the range of 150-160mmHg and a diastolic blood pressure (DBP) in the range of 90-100mmHg was recorded in both upper limbs, a SBP in the range of 170-180mmHg and a DBP of 100-110mmHg in the lower limbs. Airway, spine and other systemic examination was within normal limits.

Investigations revealed haemoglobin of 14.8 g/dl, left ventricular hypertrophy on electrocardiography (ECG), normal echocardiography (ECHO) with 58% ejection fraction with no evidence of re-coarctation. Ultrasonography of abdomen was normal.

A cardiologist opinion was taken for the patient. He was advised to take tablet metoprolol 25 mg half twice daily for one week and then be taken for surgery. He was accepted under ASA grade 2 and a titrated epidural anesthesia was planned for him. Night before surgery anxiolysis and antiemetic prophylaxis was given to the patient. He was given his antihypertensive medications on the morning of surgery with oral sips of water. On the operating table his baseline pulse rate was 70beats per minute and blood

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pressure was 134/84 mmHg. Under aseptic precautions an 18 gauge epidural catheter was inserted in L2-L3 space and fixed. A test dose of 1.5 ml of 2% lignocaine with adrenaline was given. After confirming the correct placement of the epidural catheter, 6 ml of 2% lignocaine was injected slowly epidurally. His heart rate and BP were carefully monitored. An upper level of sensory blockade upto L1 was achieved after waiting for 15 minutes. To increase the level upto T10, another 5 ml of 0.5% bupivacaine was injected epidurally. Intraoperatively his systolic blood pressure was maintained between a minimum of 106 and a maximum of 120 mmHg, Diastolic blood pressure between 60- 80 mmHg and the pulse rate between 59-67 beats per minute.

Post operatively patient was comfortable and his vitals and oxygen saturation were within normal limits. As per patient demands epidural was used to give postoperative analgesia. Patient was advised to take tablet metoprolol control of blood pressure for life long.

### DISCUSSION

Coarctation of aorta after surgical repair is associated with excess long term mortality and morbidity due to ischaemic heart disease, formation of aneurysms of aorta, recurrent or residual recoarctation, systemic hypertension, premature atherosclerosis, valve abnormalities and cerebrovascular disease, and sudden death.<sup>2,5</sup> 30% patients exhibit daytime systolic hypertension with a higher incidence in those repaired after the first year of life.<sup>6</sup> Our patient was an apt example of a patient of coarctation of aorta who had undergone late surgical correction of the coarctation and presented to us with systemic hypertension. As said by some authors, a subset of patients without clinical evidence of a recurrent coarctation will develop hypertension, cerebrovascular disease and abnormal vascular reactivity.<sup>7</sup> Intracranial (IC) aneurysms can develop in patients with coarctation of aorta several years after the surgical repair due to increased vessel wall sheer stress. CoA is also associated with increased incidence of intracranial aneurysm rupture.<sup>3</sup> A detailed preoperative evaluation of these patients and keeping in mind all these possibilities is very important. Investigations like ECG, ECHO, exercise stressing and Magnetic Resonance Imaging of the brain to look out for IC aneurysms are important. We subjected our patient to most of these investigations preoperatively.

Grown up congenital heart disease ( GUCHD) patients represent a spectrum, from completely well patients with normal physiology to those with severely deranged physiology.<sup>1</sup> In patients in whom there has been a good outcome from cardiac surgery, conventional anesthetic management is appropriate. In patients with functional limitation, the anesthetic technique is modified to take into account the main problems currently represented by the patient. A detailed understanding of the cardiac defect, the patient's functional status and anticipation of the perioperative stresses is vital in the perioperative management.<sup>1</sup> Our patient was put on oral beta blockers as soon as he was diagnosed with systemic hypertension preoperatively. This was continued postoperatively. There is a good rationale for betablockers to reduce vessel wall shear stress and they are the drugs of choice to treat systemic hypertension due to coarctation of aorta.<sup>5</sup> We avoided general anesthesia in order to avoid the stress response of intubation and surgery. We did not choose local nerve block as the hernia was quite big in size. We chose titrated continuous epidural anesthesia technique with slow and gradual injection of drugs, so that a graded decrease in the blood pressure could be achieved unlike subarachnoid block wherein precipitous hypotension can occur; nevertheless it could also be used for postoperative analgesia. We chose titrated continuous epidural anesthesia technique with slow and gradual injection of drugs, so that a graded decrease in the blood pressure could be achieved unlike subarachnoid block wherein precipitous hypotension can occur; nevertheless it could also be used for postoperative analgesia.

### CONCLUSION

Our case depicts the successful perioperative management of post-surgical coarctation of aorta by a thorough understanding of the condition, a careful preoperative work up, efficient control of blood pressure, the use of continuous epidural anesthesia and good team work between cardiologist, surgeons and anesthesiologists.

**Conflict of interest:** Nil declared by the authors

**Authors' Contribution:** MSK: Concept, conduction of the study and manuscript writing; JBA: Conduction of study work; SPM: Material collection; RR: Manuscript typing

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