

Off-pump awake coronary artery bypass grafting under high thoracic epidural anesthesia

Bharat Paliwal, Manoj Kamal, Dilip Singh Chauhan, Anamika Purohit¹

Department of Anesthesiology and Critical Care, Dr. S. N. Medical College, ¹Department of Obstetrics and Gynecology, District Hospital, Poata, Jodhpur, Rajasthan, India

Abstract

Conventionally general anesthesia has been the preferred anesthetic technique for coronary artery bypass grafting (CABG). Ever since the first awake CABG the concept though appearing promising is still being continually evaluated. From the Indian perspective, the practice has been largely limited to certain institutions and seems to be not widely practiced across India. This case reports our experience with this technique from the western part of the country.

Key words: Awake coronary artery bypass grafting, general anesthesia, Indian perspective

Introduction

While technical modifications such as off-pump technique have reduced the postoperative complications and surgical mortality of coronary artery bypass grafting (CABG), awake CABG using thoracic epidural analgesia (TEA) alone opens the opportunity of surgery for those patients who are not suitable candidates for general anesthesia (GA).

Case Report

A 56-year-old male, weighing 55 kg and 165 cm tall was posted for CABG. He had a history of Koch's chest. Physical examination revealed breath holding time of 15 s and reduced air entry. Pulmonary function tests showed moderate obstructive pathology (post-bronchodilator forced expiratory volume in 1 s 50% of predicted and reversibility postbronchodilator therapy of 15%). Echocardiography revealed left ventricular ejection fraction of 65% with no

regional wall motion abnormality. Coronary angiography showed 90% block at left anterior descending (LAD) artery ostium. Functional capacity of the patient was NYHA Class II and objective assessment was Class C. All medications were continued till the morning of surgery except for aspirin and clopidogrel, which were stopped for 1-week. A day prior to the surgery the patient was counseled for the procedure and an epidural catheter placed at T2-T3 interspace.

On the day of surgery after applying electrocardiograph and pulse oximetry, premedication with 1 mg midazolam, 5 mg ondansetron and 50 µg fentanyl was given. This was followed by placement of the arterial cannula, central venous catheter, and Swan-Ganz catheter under local anesthesia. Epidural was activated with a mixture of 0.375% ropivacaine (10 ml) and 5 µg/ml fentanyl followed by infusion of the solution at the rate of 10 ml/h. A sensory block of C7 to T10 level was tested with pin-prick 20 min after drug administration. No significant hemodynamic changes occurred during the procedure. The occlusive screen was placed and patient kept on inhaled oxygen at 4 L/min by ventimask. An additional 100 µg fentanyl intravenous (IV) was given

Address for correspondence: Dr. Bharat Paliwal, Sector-23, House-14, Chopasni Housing Board Colony, Pal Road, Jodhpur - 342 008, Rajasthan, India.
E-mail: docbpali@gmail.com

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before sternotomy. Patient underwent all the surgical events without discomfort.

Planned bypass graft of left internal mammary artery (LIMA) to LAD artery could not be achieved due to LIMA injury during harvesting. The saphenous vein from the right leg was harvested under femoral nerve block and was used for the bypass graft. Hemodynamic and respiratory parameters were monitored and well maintained during the procedure. Immediately after surgery patient could sit upright with support as well as inhale deeply without any discomfort.

Postoperatively the epidural infusion was continued for 72 h using a mixture of 0.25% ropivacaine and 5 µg/ml fentanyl at the rate of 8-10 ml/h. Visual Analogue Scale score was used to assess pain relief. The only complaint in the immediate postoperative period was nausea, which responded to 5HT₃ antagonist. Epidural catheter, all invasive lines and chest drain were removed on 3rd postoperative day and aspirin-clopidogrel started. He was mobilized on the same day and discharged from the hospital on the 7th day.

Discussion

Since the first CABG in an awake patient was performed in October 1998 with high TEA block,^[1] occasional cases have been reported in the literature with varying success. A few have reported conversion rate to GA of 7^[2] to 20%.^[3]

Awake CABG using high thoracic epidural has several benefits^[4] including avoidance of GA and positive pressure ventilation. T1-T5 sympathectomy dilates coronary arteries and internal thoracic artery. TEA also reduces the endogenous stress response, heart rate, and arrhythmias during manipulation of the heart,^[5] and also reduces the risk of myocardial ischemia and postoperative atrial fibrillation. The effective pain management allows adequate spontaneous ventilation and thus reduces postoperative pulmonary complications.^[6] It also allows rapid mobilization and recovery and thus decreased intensive care unit stay.^[7]

A few issues need to be addressed. First is the perceived risk of epidural hematoma formation with heparinization. Several studies have shown epidural catheter placement to be safe in patients undergoing surgery if the ASRA guidelines are strictly adhered to.^[8] Epidural catheters should be inserted not less than one hour before anticoagulation. In case of bloody tap the surgery should be delayed for 24 h.^[8] Postoperatively the catheter should not be removed if the international normalized ratio is > 1.5.

Patient selection is of prime importance as is preoperative counseling. Verbal reassurance during surgery, music through headphones or sedation with IV midazolam or propofol infusion may be employed.

Another issue is the presence of “patchy” block unidentified during routine preoperative pin-prick testing. Therefore reassessment should be carried out before skin.

Conclusion

We found our first experience of awake CABG satisfying as the patient was pain-free and remained hemodynamically stable.

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Conflicts of interest

There are no conflicts of interest.

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