

Anesthesia Management of an Elderly Patient Having Permanent Pacemaker for Total Hip Replacement

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Abstract

Elderly patients with serious cardiac problems are presenting for major orthopedic surgeries. We present a case of an elderly male patient posted for total hip replacement having a permanent pacemaker *in situ* in ventricle paced, ventricle sensed, pacing inhibited (VVI) mode. The patient, on preoperative examination, was found to have a complete atrioventricular (AV) block on electrocardiogram (ECG) and electrophysiology study showed degenerative AV conduction disease and symptomatic complete AV block. The patient had seizure disorder and anemia, for which the patient was treated accordingly and optimized before surgery. The pacemaker mode changed to vesiculo-vacuolar organelle (VVO). Combined spinal-epidural was given. Arterial line was secured and the patient was monitored hemodynamically. The patient tolerated the procedure of total hip replacement well; vitals were maintained within 20% of the baseline. Phenylephrine infusion was given to maintain blood pressure. After operation was shifted to the intensive care unit (ICU), pacemaker was reprogrammed to VVI mode, and epidural infusion for pain and vigilant monitoring was done. The patient was shifted to the ward on the 3rd day and was discharged on the 5th day. To conclude, combined spinal-epidural along with invasive cardiac monitoring is a reasonable choice for elderly patients with permanent pacemakers coming for major orthopedic surgeries.

Key words: Invasive cardiac monitoring, pacemaker, regional anesthesia, total hip replacement

INTRODUCTION

Patients with cardiac disease presenting for noncardiac surgery pose a considerable challenge to the anesthesiologist. With the availability of better medical facility and sophisticated diagnostic methods, many patients, especially of the elderly age group, are detected to have electrophysiological disorders. Pacemakers are being used with greater frequency for both conduction and arrhythmia problems in such patients. Care of the pacemaker during surgery as well as understanding its anesthetic implications is crucial in the management of these patients.^[1,2]

CASE REPORT

An elderly patient aged about 70 years was posted for total hip replacement. The patient underwent investigation required for the proposed surgery. The patient was found to have advanced atrioventricular (AV) block with narrow quick release system (QRS) complex on electrocardiogram (ECG) [Figure 1]. On electrophysiology study, he was diagnosed to have degenerative AV conduction disease and symptomatic

complete AV block. The patient underwent permanent pacemaker implantation and was on VVI mode (Medtronic—VITATRON-E10A1-VVI). The patient having anemia of hemoglobin 8.6 g/dL was treated with blood transfusion. The patient is a known case of seizure disorder on irregular treatment with phenytoin for 5 years. The cardiologist opined the patient fit for surgery with high-risk, cardiac monitoring during surgery, the mode was to be changed to Ventricle paced, none sensed, no response (VVO) during surgery, only bipolar cautery was to be used in short bursts, and reprogramming was to be done after surgery. Negative history for other co morbidities.

On examination, the patient was around 60 kg with 165 cm height. He had no symptoms or signs of cardiorespiratory failure. Airway and spine examination were within normal

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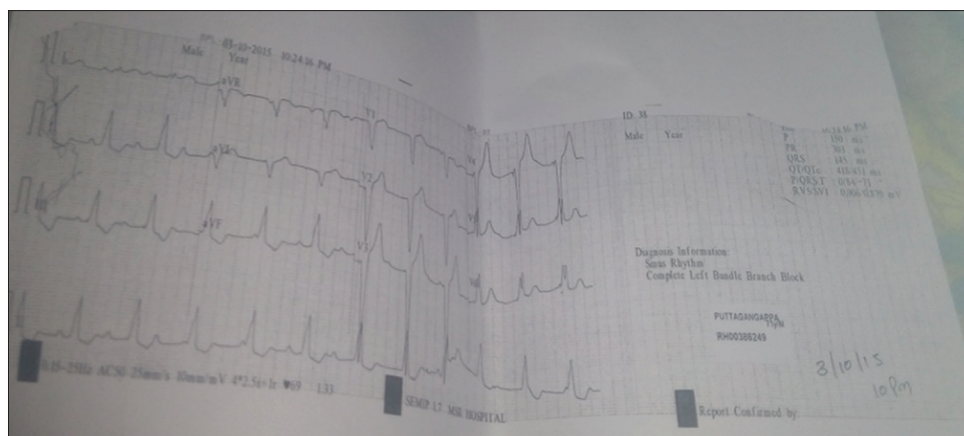


Figure 1: ECG findings of complete bundle branch block

limits. The patient was explained combined spinal-epidural anesthesia, consent was taken regarding to anesthesia, invasive monitoring, blood transfusion, and post-op intensive care unit (ICU) care. Programmed to vesiculo-vacuolar organelle (VVO) mode on the day of surgery and heart was paced at 70 per min. Investigations were within normal limits.

Anesthesia technique

On the day of surgery the patient shifted to operation theatre and connected to vital monitors and baseline were recorded. 16G intravenous (IV) cannula was secured and arterial cannula secured under local anesthesia and beat-to-beat blood pressure (BP) was recorded. The patient in lateral position, under aseptic measures epidural was secured in T12–L1 interspace and spinal was given in L3–4 space with 0.5% H bupivacaine 10 mg with fentanyl 25 mcg. The table was tilted to achieve levels of T10. The patient underwent total hip replacement. Vitals were maintained within 20% of baseline with phenylephrine infusion to treat hypotension. Heart being paced at 70 per min, hypotension was treated aggressively.

Postoperative care

The patient was monitored in surgical ICU for vitals. Epidural infusion of 5 mL/h was started with bupivacaine 0.1% and 2 mcg fentanyl per mL for pain management. Post-op investigations were done and blood transfused accordingly. The pacemaker was reprogrammed to VVI mode. The patient was kept in the ICU for 48 h, later shifted to the ward, and after 5 days was discharged home.

DISCUSSION

Knowledge of the type of device, the manufacturer, and the mode of pacing is important before any surgery due to variation in their behavior and functioning. Modern pacemakers are programmable in a rate responsive fashion or a fixed mode. There are several factors that can interfere with sensing these variations.^[3]

Safe anesthetic management of the patient with a pacemaker should start with a preoperative visit and review of the

clinical records. It requires a thorough understanding about the indication of pacemaker insertion, various modes of pacing, and programming of pacemaker. Any cardiorespiratory symptom should be managed aggressively before anesthesia. It is advisable to have the manufacturer's programmer available in the hospital should any problems arise.^[4,5]

CONCLUSION

Regional anesthesia technique with invasive cardiac monitoring is a reasonable choice for the elderly patient with a permanent pacemaker for serious cardiac conditions coming for major orthopedic surgery.

They should have preoperative optimization, vigilant monitoring, favourable intraoperative techniques, prompt treatment of complications, adequate pain relief, and dedicated postoperative care unit for successful management of these patients.

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Conflicts of interest

There are no conflicts of interest.

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