Original Research Paper

Volume - 10 | Issue - 7 | July - 2020 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Anaesthesiology

ANAESTHETIC MANAGEMENT OF PATEINT WITH IMPLANTED CARDIAC PACEMAKER POSTED FOR NON CARDIAC SURGERY

Dr Sudhakaran R	Junior Resident Department of Anaesthesiology, Critical Care and Pain medicine, Sree Balaji Medical College and Hospital
Dr Raj M*	Senior ResidentDepartment of Anaesthesiology, Critical Care and Pain medicine, Sree Balaji Medical College and Hospital *Corresponding Author
Dr Senthil kumar V.S	Professor Department of Anaesthesiology, Critical Care and Pain medicine, Sree Balaji Medical College and Hospital

KEYWORDS :

INTRODUCTION:

Patients with cardiac disease presenting for noncardiac surgery pose a considerable challenge to the anesthesiologists. Care of the pacemaker during surgery as well as understanding its anesthetic implications is crucial in the management of these patients. The perioperative management of patients with permanent pacemaker undergoing noncardiac surgery is discussed. Cardiac pacing is one of the most reliable documented treatment for various cardiac arrhythmias, especially bradyarrhythmias. The initial pacing system consisted of a single lead asynchronous pacemaker, which paced the heart at a fixed rate. Over the years, the technological advances have revolutionised the pacemakers and currently more sophisticated multiprogrammable devices are available. Automated implantable cardioverter defibrillators (AICD) have been designed to treat fatal tachyarrhythmias. With the availability of pacing devices to suit many conditions, potential indications for pacing are expanding. About 80% of these procedures consisted of bradycardia-related permanent pacemaker (PM) insertions, 10% were ICDs and the remaining were cardiac resynchronization therapy devices (CRTDs). Hence, it is reasonable to expect anaesthesiologists to encounter patients with either one of the Cardiac implantable electronic devices (CIEDs) scheduled for surgery in their day-to-day practice.

CASE REPORT:

A case of a 75 year old female with Left midshaft of humerus fracture following a slip and fall was planned for open reduction and internal fixation of fracture. Pre operative assessment showed that the patient is Diabetic for 15 years on regular OHA treatment Hypertensive for 20 years on T.Amlodipine, T.Enalapril and T.Aspirin. She was diagnosed to have Sick Sinus Syndrome 8 years back with unstable angina and symptomatic complete heart block for which she was implanted with a cardiac pacemaker. Cardiology opinion was obtained and pacemaker mode was changed from VVI to asynchronous mode (VOO) . Pacemaker battery evaluation was done .Patient was taken up for surgery under ASA – III

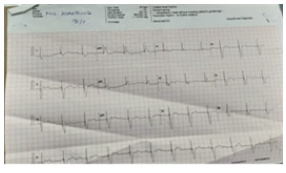
INTRAOPERATIVE MANAGEMENT:

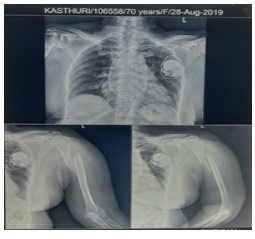
After shifting the patient to the Operating room, standard monitors were connected. Wide bore peripheral line was secured . Inj Isoprenaline was kept ready and other emergency drugs were kept ready. Under Aseptic precaution Right radial arterial line was secured under local Anesthesia for invasive Blood pressure monitoring. Procedure was done under general anesthesia using Inj.Propofol as induction agent . Using 7.0 ID endotracheal tube patient was intubated. Bilateral air entry checked and tube fixed at 19 cms. Depth of anesthesia maintained with oxygen (50%)+N2O(50%)+Isoflurane(0.8 mac)+ Inj Atracurium. Under ultrasound guided Infraclavicular block given with mixture of 20 ml Inj Ropivacaine 0.2% with Inj dexamethasone. Standby Cardiologist was present for intraoperative pacing if needed while using cautery. Intraoperative continuous ECG monitoring was done and vitals was stable and patient was extubated and shifted to ICU for observation.

DISCUSSION:

Cardiac implantable electronic devices (CIEDs) are used to treat problems with rhythm and heart failure. All cardiac pacemakers consist of a pulse generator, which provides the electrical impulse from a battery power source implanted commonly in the infraclavicular region of the anterior chest wall, and one or more electrodes (referred to as leads), which deliver the electrical impulse from the pulse generator to the myocardium. The leads are placed either percutaneously or via venous cutdown.

‘

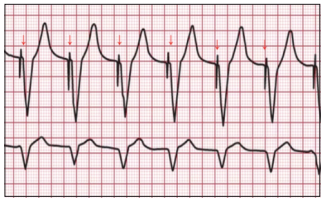




Position I Pacing	Position II Sensing	Position III Response(s)	Position IV	Position V Multisite
chamber(s)	chamber(s)	to sensing	Programmability	pacing
O	O	O	O	O
A	A	I	R	A
V	V	T		V
D (A + V)	D (A + V)	D (T + I)		D (A + V)

Electromagnetic Interference (EMI):

Most pacemakers are sensitive to direct or indirect EMI. Surgical electrocautery are the most common direct sources of EMI that could interfere with pacemaker. The indirect sources of EMI include radar, orthopaedic saw, telemetric devices, mechanical ventilators, lithotripters, cellular telephones, and whole body vibrations are the potential sources of mechanical interferences that could affect pacemaker. Diagnostic radiology and computed tomographic (CT) scans do not affect the function of the pacemaker. Amongst these, electrocautery is the most important source of EMI. It involves radiofrequency current of 300-500 KHz. Fatal arrhythmias and deaths have been reported with the use of electrocautery leading to failure of Pacemaker.



VVI Pacing spikes

REPROGRAMMING WITH A PROGRAMMING DEVICE : A reprogramming machine is used to suspend anti-tachyarrhythmia settings. It is essential to have transcutaneous pacing when the anti-tachyarrhythmia functions are disabled, as the AICD will not respond when there is Ventricular Tachycardia. The advantages of using a reprogramming machine include changing an Automated implantable

cardioverter defibrillator(AICD) to asynchronous mode and disabling a rate responsive sensor. However, the use of a reprogramming machine must be done by trained personnel and the changes are not quickly reversible like that of a magnet.

INTRAOPERATIVE EMERGENCIES : In the event of an arrhythmia or bradycardia, before attempting defibrillation, the magnet if applied should be removed to permit reactivation of anti-tachyarrhythmia function. All sources of EMI should be discontinued to allow proper interpretation of the rhythm and appropriate therapy. Failure of the rhythm to revert after removal of the magnet will require either defibrillation or cardioversion depending on the rhythm. During the occurrence of such an event, bedside ECG recording with paper is helpful to determine the ventricular rate and rhythm. There may be a possibility that the recorded ventricular rate is lower than the set rate on the AICD, requiring reprogramming of the device in the post-operative period. Total failure of a device is rare. Exposure of older devices to EMI rarely results in total failure. Problems with the device may manifest as inappropriate delivery of shocks or 'runaway' high rate (180–200 beats/min).

POST-OPERATIVE MANAGEMENT : The rate and rhythm must be monitored continuously in the post-operative period. The CIED must be interrogated in the immediate post-operative period. Following surgery till the device is reprogrammed to the original setting, the patient must be continuously monitored on an ECG and pulse oximetry.

CONCLUSSION:

Anesthetic management should be planned preoperatively according to patient's medical status. Careful monitoring of ECG, pulse oximetry and arterial blood pressure should be done. While using electrocautery, precaution for minimal EMI should be taken. Rate responsive pacemakers should have rate responsive mode disabled before surgery. Provision of temporary pacing should be available in the OT to deal with emergency situation of pacemaker malfunction. Pacemaker should be rechecked after the procedure. In our case a thorough pre-operative assessment was done and care was taken to optimize the medical condition of the patient.A team of experts which consisted of anaesthesiologist, cardiologist, implant reprogramming technician was made available during the perioperative period. Intraoperative emergencies pertaining to the pacemaker was anticipated and measures were taken to handle the scenario. In our case the perioperative period was uneventful and patient was shifted to the ICU for postoperative management.

REFERENCE:

1. Levine PA, Balady GJ, Lazar HL, Belott PH, Robert AJ. Electrocautery and pacemakers: Management of t he paced patient subject to electrocautery. Ann Thorac Surg 1986; 41: 313-317.
2. Shapiro WA, Roizen MF, Singleton MA, Morady F, Bainton CR, Gaynor RL. Intraoperative pacemaker complications. Anesthesiology 1985; 63: 319-322
3. Guidelines for the Perioperative Management of Patients with Implantable Pacemakers or Implantable Cardioverter Defibrillators, Where the Use of Surgical Diathermy/ Electrocautery is Anticipated. Medicines and Health Care Products Regulatory Agency. Available from: http://www.heartrhythmuk.org.uk/files/file/Docs/Guidelines/MHRA%20guidelines%20surgery%20and%20ICDs.pdf. [Last accessed on 2017 July 7].
4. Crossley GH, Poole JE, Rozner MA, Asirvatham SJ, Cheng A, Chung MK, et al. The Heart Rhythm Society (HRS)/American Society of Anesthesiologists (ASA) Expert Consensus Statement on the perioperative management of patients with implantable defibrillators, pacemakers and arrhythmia monitors: Facilities and patient management this document was developed as a joint project with the American Society of Anesthesiologists (ASA), and in collaboration with the American Heart Association (AHA), and the Society of Thoracic Surgeons (STS). Heart Rhythm 2011;8:1114-54.