



Anaesthetic Management of a Case of Peritonsillar Abscess in a Patient with Complete Heart Block with Pacemaker

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Abstract

We report a case of complete heart block patient with pacemaker in situ (VVI mode-ventricle paced sensed and inhibited) with anticipated difficult airway of a morbid obese patient presenting for incision and drainage of peritonsillar abscess on an emergency basis because of impending respiratory distress.

The challenges encountered in this case was:

- Programming the pacemaker to asynchronous mode { VOO mode-ventricle paced, none sensed and no response to sensing) in this case }
- Managing difficult airway.

Keywords: *pacemaker, peritonsillar abscess, difficult airway*

Introduction

In a recent survey in India it was found that 37000 cardiac device implantations take place annually. There is high tendency to come across patients with implanted cardiac devices for emergent and non emergent as well as cardiac and non cardiac surgical procedures. We report a case of complete heart block on pacemaker with retropharyngeal abscess for emergency incision and drainage of the abscess. Precautions taken in a patient with pacemaker coming for emergency surgery is highlighted in this case report added to the challenges of encountering a difficult airway associated with retropharyngeal abscess in an obese patient.

Case Report

A 63 yr old female morbid obese patient presented to us with severe throat pain at rest and also during swallowing, swelling on left side of face with tenderness, hoarseness in the voice, difficulty in breathing, fever, all of which started since 2-3 days.

On examination of the patient her room air saturation was 95%. There was tachypnea and tachycardia, Pulse rate was 108bpm, blood pressure was 160/80mmhg. Patient was started on oxygen via facemask at 5 lts per min.

A detailed preanaesthetic evaluation was done and details obtained- patient was a case of complete heart block on pacemaker since 3 yrs. pacemaker was VITATRONE10AI- VVI mode. Her

effort tolerance was moderate <4 on METS (metabolic equivalent) scale. She was also a known case of hypothyroid on Tab. Thyronorm 100mcg, known hypertensive on Tab. Ramipril 5 mg OD.

On assessing her airway, she was obese -100kgs, with short neck, Thyromental distance <6cms, mouth opening was restricted to 1.5 fingers due to trismus.

All investigations inclusive of Complete blood count, Renal function test, Liver function test were within normal limit. ECG showed sinus tachycardia with intermittent pacing. 2D echo-normal Left ventricle systolic function, LVDD(left ventricular diastolic dysfunction), EF(ejection fraction)-58%.

Emergency cardiology opinion was taken prior to surgery and was advised to change the mode of pacemaker from VVI to VOO.

With the help of technician the pace maker mode was changed from VVI mode to VOO.

Patient was preoperatively nebulized with budesonide and duolin.

OT was prepared with all difficult airway equipments including fiberoptic scope, cricothyroidotomy and tracheostomy kit, external defibrillator, pacemaker technician available. ENT Team were well aware of the situation and were ready for the procedure.

Patient was taken into Operating room, all monitors inclusive of pulse oximeter, ECG(electrocardiogram),

NIBP(noninvasive bloodpressure) monitor was attached. 18G IV line secured on left hand and ringer lactate was started at 100ml/hr.

Patient was put in RAMP with 25 degree head up position since she was obese and had difficulty in lying flat on OT table. For the same reason check laryngoscopy was preferred prior to plan awake fibre optic intubation.

Patient was preoxygenated with 8 lt/min for 5 min, premedicated with Inj Glycopyrolate 0.2 mg iv, Inj Midazolam 1mg i.v, Inj Fentanyl 150mcg iv, Induced with Inj. Propofol 120 mg slow I.V and Sevoflurane 1percent was started, mask ventilation was possible with size 4 airway in situ.

Check laryngoscopy was done once patient was in deeper plane, on check laryngoscopy epiglottis was seen, hence we proceeded to give Inj propofol 50 mg IV, and muscle relaxant Atracurium 50mg IV. After 3 minutes-laryngoscopy was done and laryngoscopy grade was Cormack -lehane grade 3a, tracheal intubation was proceeded with 7 size cuffed ETT(Endotracheal tube) using a bougie. The ETT was fixed at 20 cm after confirming bilateral equal air entry. Throat was packed. Surgery was started, intraoperative vitals were stable throughout with heart rate being 70 beats /min. Inj paracetamol 1gm i.v infusion and inj Dexamethasone 8 mg IV was given. Surgery went on for 40 min. Bipolar cautery was used by surgeons to secure haemostasis. At the end of the surgery inj Hydrocortisone 200 mg IV, Inj Emecet 8 mg IV were given. Inj Myopyrrolate 2.5 mg IV was given, once the patient started adequate efforts of breathing. Throat pack was removed and Patient was extubated once there was adequate efforts of breathing and response to oral commands. She was stable post extubation. Patient was shifted to recovery and the pacemaker mode was reverted back to VVI.

Discussion

This case presented with two challenges, one was the difficult airway and other was the cardiac status of the patient. It is essential that patient has a continuous ECG monitoring, pulse oximeter and arterial pressure monitoring. Due preparedness anticipating a difficult airway and keeping all equipments for managing a difficult airway ready is another aspect of this case.

When retropharyngeal abscess by itself is a challenge to anaesthetists, obesity, as in this case superadds to it. Retropharyngeal abscess is collection of pus in the retropharyngeal space which extends from base of the skull superiorly to the mediastinum inferiorly up to T₁ level. Anteriorly it is bounded by the posterior pharyngeal wall and posteriorly by the alar fascia. Laterally it is continuous with the parapharyngeal space [1]. The clinical features are, neck stiffness, trismus and mild torticollis. Infants and children rapidly develop airway compromise and stridor [1,2]. Most of the abscesses are polymicrobial [3] with predominant organisms being Staphylococcus aureus and group A Streptococcus [4].

Treatment of choice is drainage of abscess and broad spectrum antibiotics [1,4]. Intraoral drainage is preferred if the abscess is confined above the level of hyoid bone. If it extends below the level, it should be drained externally [1].

Its anaesthetic implications are as follows. The patient is often dehydrated, that results in electrolyte imbalance and metabolic derangements due to poor oral intake [5] and may be septicemic. Difficulty in airway management is the major concern. Tracheal intubation is challenging due to distorted airway anatomy, oedema and decreased mouth opening. In early stages, induction of general anaesthesia reduces trismus; however, in later stages induction may precipitate a cannot ventilate, cannot intubate

situation. The vocal cords may be difficult to visualise due to swollen pharyngeal wall, airway oedema and laryngeal displacement [4]. Another concern is rupture of abscess and aspiration of the contents during laryngoscopy and intubation, which should be gentle to prevent this complication. Thorough throat packing should be done if uncuffed tube is used.

Our patient was a case of complete heart block with VVI mode pacemaker, anaesthetic challenges in head and neck surgeries are to be considered. With advances in cardiology and cardiothoracic surgery, several newer implantable cardiac devices have become common in the surgical population. Cardiac implantable electronic devices (CIEDs) are used to treat problems with rhythm and heart failure. A single-chamber pacemaker has a pulse generator with a single lead implanted in the right ventricle (RV). While managing such patients for non-cardiac surgeries, specific issues related to equipment characteristics and troubleshooting should be a priority for the anaesthesiologists.

All cardiac pacemakers consist of a pulse generator, which provides the electrical impulse and is implanted commonly in the infra clavicular region of the anterior chest wall, and one or more electrodes, which deliver the electrical impulse from the pulse generator to the myocardium. The leads are placed either percutaneously or via venous cut down. Position I – Reflects the chamber(s) paced; Position II – chamber(s) sensed. Position III refers to how the pacemaker responds to a sensed event; ‘I’ indicates that a sensed event inhibits the output pulse and causes the pacemaker to recycle for one or more timing cycles. ‘T’ indicates that an output pulse is triggered in response to a sensed event. ‘D’ indicates dual modes of response and is restricted to dual chamber systems. ‘O’ indicates no response to sensed input. Position IV – The fourth position reflects rate modulation, also referred to as rate responsive or rate adaptive pacing. ‘R’ indicates that the pacemaker has rate modulation and incorporates a sensor to adjust its programmed paced heart rate in response to patient activity. Position V – Rarely used fifth position. Specifies only the location or absence of multisite pacing, defined as stimulation site. If the patient is highly pacemaker-dependent, and the procedure involves potential EMI, a cardiac physiologist should be consulted as temporary reprogramming of the device to an asynchronous (non-sensing) mode (A00, V00, or D00 depending on the set configuration) may be required [6].

In an emergency, time may be inadequate to evaluate the CIED. Patients who are undergoing supraumbilical surgeries are at a higher risk for Electromagnetic interference(EMI) from the Electrocautery unit (ECU) if monopolar cautery use is needed.

Application of a magnet would be ideal if time permits. An ECG paper recording pre- and post-magnet application will allow us to know if the desired response is achieved. Application of transcutaneous pacing/defibrillator pads is essential along with a standby external defibrillator with pacing capabilities. Continuous ECG, pulse oximetry monitoring and additionally an arterial line if indicated are essential.

The rate and rhythm must be monitored continuously in the post-operative period [7,8,9]. In the presence of haemodynamic instability, selection of a higher heart rate or a more optimal atrioventricular delay may be required. Following surgery till the device is reprogrammed to the original setting, the patient must be continuously monitored on an ECG and pulse oximetry. It is essential that both transcutaneous pacing/defibrillator pads and an external defibrillator are immediately available.

Conclusion

This case presented with two challenges, one was the difficult airway and other was the cardiac status of the patient. It is essential that patient has a continuous ecg monitoring, pulse oximeter and arterial pressure monitoring. A thorough understanding of the pacemaker modes and its anaesthetic implications is extremely important. Due preparedness anticipating a difficult airway and keeping all equipments for managing a difficult airway ready is another aspect of this case. Anticipation of complications and due preparedness is pivotal to any complicated case.

Ethics approval and consent to participate

Not applicable since it is case report. However the consent of the above patient has been taken for the publication of casereport.

List of abbreviation

VVI-ventricle paced sensed and inhibited
ETT-endotracheal tube
VVO-ventricle paced sensed and no response to sensing
METS-metabolic equivalents
IV- intravenous
RAMP-rapid airway management positioner
OD- once daily
ECG- Electrocardiogram
OT- operation theatre
EMI- electromagnetic interference
CIEDs- cardiac implantable electronic devices

Data Availability

Not applicable since it is a case report.

Conflicts of Interest

“The author(s) declare(s) that there is no conflict of interest regarding the publication of this paper.”

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Authors' contributions

"Dr. Amukthamalyada was a major contributor in writing the manuscript. All authors read and approved the final manuscript."

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Supplementary Materials

Not applicable.

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