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ANAESTHETIC MANAGEMENT OF A PATIENT WITH CARDIAC PACEMAKER & RESTRICTED MOUTH OPENING IN NON CARDIAC SURGERY : A CASE REPORT

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ABSTRACT Patients with cardiac disease posted for noncardiac surgery are at higher risk and pose challenge to the anaesthesiologist. Cardiac-Pacing is treatment for cardiac arrhythmias. With increased use of cardiac implantable devices, anaesthesiologist need to be aware about different pacemakers and their types and functions. Preoperative evaluation of patient, severity of cardiac-disease, medications and pacemaker functions is must. Care of the pacemaker during surgery as well as understanding its anaesthetic implications in perioperative management of patient is necessary for uneventful management. Thereby, this case report in a 45yr old, male, with permanent cardiac pacemaker posted for I&D of right buccal cavity infection with restricted mouth opening.

KEYWORDS :

INTRODUCTION

Complete Heart block is a significant complication following closure of ventricular septal defect and subaortic membrane excision. Pacemakers and the underlying pathophysiologies leading to their implantation present challenges to the anesthetist. This case report discusses the anesthetic management of a patient with an implanted pacemaker and restricted mouth opening.

CASE REPORT

A 45yr old, male weighing 60kg was scheduled for I &D of right buccal cavity infection. He had undergone subaortic membrane excision & peri membranous VSD closure, he developed complete heart block postoperatively and permanent pacemaker was implanted .On general examination patient had a prominent v arched palate with mouth opening less than one finger. Routine blood investigations were within normal limits .ECG showed pacemaker rhythm, 2D echo was normal. Chest X-ray showed pacemaker with impulse generator. Thorough interrogation with competent authority was carried out for obtaining pacemaker details like when it was implanted, battery life, mode, effect of magnet, baseline rate etc. Our patients base line heart rate was 60/min and on VDD-R mode. Pre induction pacemaker was set to asynchronous mode (VVI to VOO) and baseline heart rate was reset from 60/min to 80/min.Monitors in the form of ECG, Pulse Oxymetry , Non-invasive blood pressure , Capnography and Temperature were applied. Consent for general Anaesthesia was taken. Inj. Glycopyrolate 0.2mg and nebulization with 2% lignocaine was given 20 min's prior. Awake Intubation was planned with Ambuscope , a 6.5mm cuffed portex ETT was passed through the nose and secured after checking for b/l air entry.Anaesthesia was induced with inj propofol 2mg/kg, inj vecuronium 0.1mg/kg and maintained with O_2 + N_2O+ Isoflurane and Inj. Vecuronium bromide. During intraoperative period care was taken to maintain normotension, normocapnea and normal temperature. A bipolar cautery was used . Following completion of surgery patient was reversed with Inj. Glycopyrollate 10µg/kg and Inj. Neostigmine 0.04mg/kg. Patient was extubated after having adequate tone, power and consciousness. Then she was shifted to I.C.U where her heart rate was reset to 60beats/ min.Analgesia in form of Diclofenac sodium was given and care was taken to prevent shivering.

DISCUSSION:

Permanent complete heart block (CHB) has been reported after repair of lesions such as isolated ventricular septal defect (VSD), atrio ventricular septal defect(AVSD) VSD in the setting of conotruncal anomalies (Tetralogy of Fallot (TOF), double outlet right ventricle (DORV) and sub-aortic stenosis (SAS). The relevant part of cardiac conduction system in this setting is atrioventricular (AV) node and bundle of His. Cardiac pacing is one of the most reliable documented treatment for various cardiac arrhythmias, especially bradyarrhythmias since 1950[1]. A pacemaker consists of an impulse generator and a lead or leads to carry the electrical impulse to the patient's heart. Leads can be unipolar/ bipolar/ multipolar connected to the heart chambers through vena cava or on surface of heart epicardially. The generic codes for pacemaker are mentioned below (Fig 1.1):

Generic codes for pacemaker[2] - (Fig 1.1)

Position I	Position II	Position III	Position IV	Position V
Pacing Chamber(s)	Sensing Chamber(s)	Response(s) to Sensing	Programmability	Anti-Tachycardia Function(s)
O= None	O= None	O= None	O= None	O= None
A = Atrium	A = Atrium	I = Inhibited	P = Programmable	P = Pacing
V = Ventricle	V = Ventricle	T = Triggered	M= Multiprogrammable	S = Shock
D = Dual (A+V)	D = Dual (A+V)	D = Dual (I+T)	C = Communicating	D = Dual (P+S)
			R = Rate Modulation	

Preoperative evaluation is an important part of anaesthetic management of a patient with pacemaker undergoing non cardiac surgery. It includes evaluation of the patient and the pacemaker. In addition, one should know the severity of the cardiac disease, the current functional status and medications of the patient. Preoperative assessment should aim to identify the type of device, including details of the manufacturer and model, the programmed settings (e.g. mode and rate) and the indication for the implant. Most of this information including half life of pacemaker battery can be taken from the manufacturer's book kept with the patient. Appropriate reprogramming by applying magnet is the safest way to avoid intraoperative problems. Reprogramming a pacemaker to asynchronous mode at a rate more rapid the patient's base line rate ensures that no over sensing during electromagnetic interference will take place. Any rate responsiveness and other enhancements should be disabled. In our patient pacemaker was reset from VVI to VOO mode and heart rate was reset from 60/ min to 80/min before induction of anesthesia. Airway evaluation showed V arched palate and 1 finger mouth opening. A 12 lead ECG and chest X Ray (for visualization of continuity of the leads) should be performed. Blood chemistry values can affect pacemaker function. Severe cases of alkalosis and acidosis will cause increases in the threshold voltage and current requirements of ventricular stimulation[3]. Acute hypokalemia caused by hyperventilation or diuretic therapy causes

an increase in threshold and could lead to loss of capture. Acute hyperkalemia increases myocardial irritability and raises the possibility for ventricular dysrhythmias, especially in the ischemic heart.

Intraoperative monitoring includes ECG , pulseoximetry, $Etco_2$, temperature.Awake Intubation was done with Ambuscope , a 6.5mm cuffed portex ETT was passed through the nose and secured after checking for b/l air entry. Succinylcholine, ketamine, Etomidate should be avoided as they cause myoclonic movements[4,5]. Inhalational agents do not alter current voltage thresholds of pacemaker[6]. Anaesthesia was induced with inj propofol 2mg/kg, inj vecuronium 0.1mg/kg and maintained with O_2 + N_2O+ Isoflurane and Inj. Vecuronium bromide. We used bipolar cautery as it is less hazardous than unipolar[4]. If unipolar cautery is to be used, the grounding plate should be placed close to the operative site and as far away as possible from the site of pacemaker, usually on the thigh and should have good skin contact. Electrocautery should not be used within 15 cm of pacemaker. Frequency of electrocautery should be limited to 1 second bursts in every 10 seconds to prevent repeated asystolic periods- short bursts with long pauses of cautery are preferred[7].In the present case, intraoperative course was uneventful. There was no episode of hypoxia and hypercapnia throughout the procedure as pacing threshold may be affected by hypoxia, hypercapnia, metabolic disturbance and electrolyte imbalance.

CONCLUSION

The ideal perioperative management of patients with a CIED derives from a multidisciplinary approach involving the procedural team and the patient's CIED team. Anticipation of behaviour, both of the patient and of the device, is the key to safe management for an uncomplicated procedure. When interrogation facilities unavailable - Careful history taking, inspection of the patient's device information card and by contacting the pacing clinic that the patient attends are most important. Device manufacturers, contact details are available on device identification cards. Trans – cutaneous pacing and Trans- venous pacing facility should be present in O.T.

REFERENCES

1. Hayes DL,Zipes DP.Cardiac Pacemakers and cardioverter-defibrillator.In:Braunwald E,Heart Disease 6th edition,Philadelphia,WB Saunders,2001;7775-814
2. Bernstein AD, Camm AJ, Fischer JD, et al. The NASPE/BPEG Defibrillator Code. PACE 1993; 16: 1776- 80
3. Hughes HC, Tyers FO, Torman HA. Effects of acid-base imbalance on myocardial pacing thresholds. J Thorac Cardiovasc Surg. 1975;69:743-746
4. Ramon-Gonzalez J, Hyberger LK, Hayes DL. Is electrocautery still a clinically significant problem with contemporary technology. Pace 2001; 24: 709.
5. Senthuran S, Toff WD, Vuylsteke A, Solesbury PM, Menon DK. Implanted cardiac pacemakers and defibrillators in anaesthetic practice. Br J Anaesth 2002; 88: 627-31.
6. Atlee JL, Bernstein AD. Cardiac rhythm management devices. (Part II) perioperative management. Anesthesiology 2001; 95: 1492-1506.
7. Simon AB. Perioperative management of the pacemaker patient. Anesthesiology 1977; 46: 127-31.