

Case Report: A Parturient With Complete Heart Block For LSCS

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Abstract :

Heart block may be congenital or acquired secondary to cardiac surgery, rheumatic heart disease or infective disorders. Heart block is a relatively rare and potentially serious problem in pregnancy^[1]. A patient of heart block may develop syncope, convulsions or even sudden death. A normal physiologic response to pregnancy increases the cardiac output by about 30-50% mainly by an increased heart rate, vasodilatation and increased blood volume. These changes stress a diseased heart in third trimester and make them worse during labour. The negative inotropic, chronotropic and arrhythmogenic potential of inhaled anaesthetic agents makes the management of such patients difficult. Here we report a successful management of a patient with heart block under general anaesthesia who required intraoperative pacing via a preoperatively placed temporary pacemaker.

Key Words: Complete Heart Block, Pregnancy, Pacing

Case report:

A 26 yr old patient came to the hospital with 32 week 2 day gestation and swelling over both feet since 15 days. She was a known case of heart block and was asymptomatic in her earlier antenatal visits and was being regularly followed up by physicians. There were no complaints of dyspnea, palpitations or chest pain. Examination revealed pulse rate of 45 beats/min regular, blood pressure of 160/100 mm Hg, and irregular cannon waves on JVP examination and bilateral pitting edema over both feet. Systemic examination was found to be normal. Routine investigations were normal except for albuminuria and Electrocardiogram suggestive of complete heart block with ventricular rate of 40 beats/min (Fig 1). ECHO showed Left Ventricular Ejection Fraction of 57.8%, mildly increased pulmonary artery systolic pressure, normal Left Ventricular diastolic function.

Antihypertensive drugs were started on admission which included Tablet Aldomet, Amlodipine and Cardace. Other supportive measures were also started. At 35 weeks of gestation, patient went into labor. Since patient developed palpitations and

discomfort during breathing, decision for insertion of temporary transvenous pacemaker was taken. Position of pacemaker was confirmed with Ultrasound chest. On the same day patient was taken for Lower Segment Caesarian Section (LSCS) for non progression of labor.

A lower segment caesarian section was done under General Anaesthesia with rapid sequence intubation. After 3 min of preoxygenation with 100% oxygen, patient was induced with 2.5% Thiopentone 325mg. Suxamethonium 75mg was administered intravenously to facilitate tracheal intubation. Intubation was carried out using a 7.5mm cuffed red rubber tracheal tube.

Anaesthesia was maintained with isoflurane, oxygen and nitrous oxide. A single live preterm female was delivered. Fentanyl 150 mcg was administered in divided doses. Intraoperatively, patient developed ventricular ectopics in runs of 8-9 beats/min and heart rate dropped to 38 beats/min. Patient was therefore put on temporary pacemaker with heart rate of 60 beats/min, output of 2mA, and sensitivity of 0.5 mV (Fig 2). After 15 min, patient developed normal rhythm off pacing, and was hemodynamically stable. Patient was shifted to Cardiac Care Unit for further post operative management.

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Fig 1.Pre operative ECG of the patient.

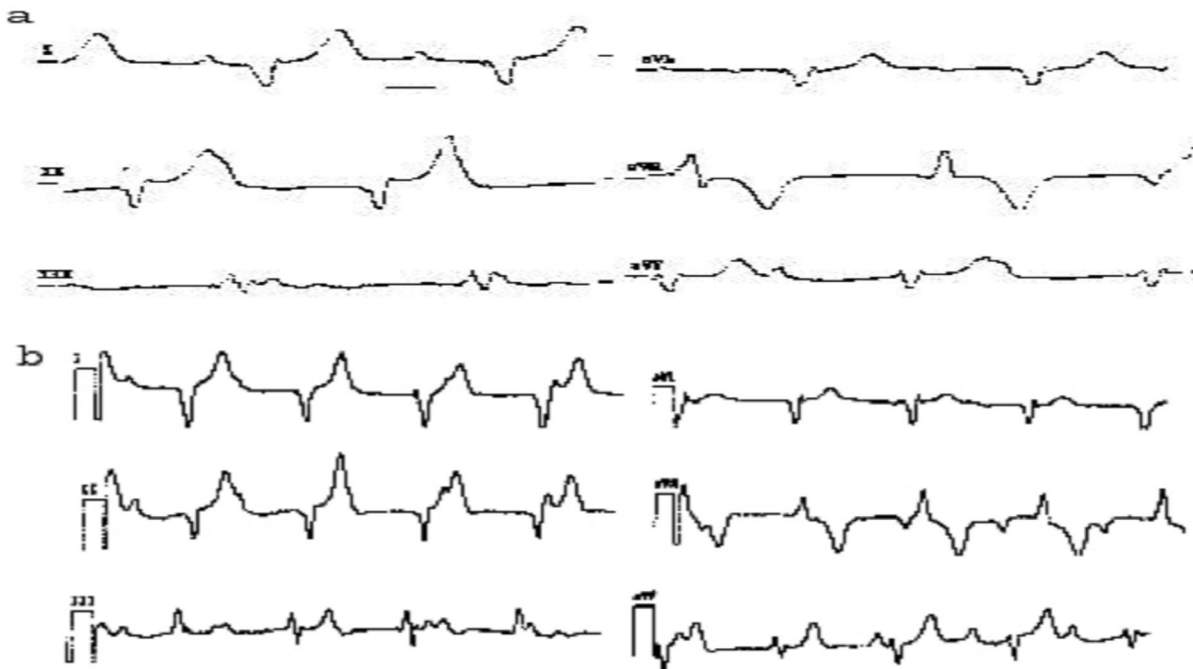


Fig. 2(a) Intra-Operative ECG of the patient before pacing ; (b) ECG of the patient during pacing.

Discussion:

Women with complete heart block may tolerate pregnancy well, although the limitation in heart rate response may limit their ability to augment cardiac output. This is especially important owing to the fact that such patients have dilated ventricles with chronically high stroke volume in the nonpregnant state, with a limited capacity to further augment end-diastolic volume and stroke volume, despite the expansion of intravascular volume that occurs in early pregnancy.

In such patients, labor can be complicated by syncope and convulsions due to slowing of the heart

rate during the Valsalva maneuver, which may occur during forceful uterine contractions in the second stage of labor^[2].

The primary indication for caesarian section should be fetal or obstetric concern as caesarian section is known to be associated with greater volume shifts jeopardizing cardiovascular system^[3].

It is preferable to deliver these women in a lateral decubitus position to minimize the bearing down, and to shorten the second stage by using a pair of forceps^[4].

Anaesthetic problems encountered in patients with complete heart block include bradycardia, hypotension, arrhythmias, cardiac arrest or even

sudden death^[5].

There is controversy regarding the value of prophylactic insertion of pacemaker in pregnant patients. For symptomatic patients in the first trimester, permanent pacemaker implantation is the therapy of choice^[6,7,8]. If the patient is at or near term, temporary pacing right before induction of labor can prevent the complications of prolonged temporary pacing^[4].

Chan and colleagues compared the three different modes of emergency cardiac stimulation- percussion, transcutaneous, and transvenous pacing^[9]. Ventricular stroke volumes calculated with the use of a previously inserted pulmonary artery catheter were comparable for all 3 techniques.

Percussion pacing is based on the physical phenomenon of energy transformation. Mechanical energy applied to viable myocardium triggers an electrical impulse after an all-or-none principle. The ICLOR (International Liaison Committee on Resuscitation)^[10,11] and ERC (European Resuscitation Council)^[10,12] recommend serial blows with a rate of approximately 50-70 per min. To estimate the required mechanical energy, it is recommended to let the ulnar side of clinched fist fall from a height of approximately 20-30 cm above the chest to the lower left sternal edge^[13].

Transcutaneous pacing is performed non-invasively by means of two conductive electrodes, anterior on the left anterior chest, midway between the xiphoid process and left nipple, and posterior electrode below the left scapula, lateral to the spine and at the same level as the anterior electrode. It is effective and requires high capture thresholds in patients who are hemodynamically stable. It is shown that transcutaneous pacing hemodynamically, is as effective as transvenous pacing. Pain is a important side effect of this technique.

Criteria for temporary pacing include atropine-resistant bradycardia, first- and second-degree atrioventricular block, and atrial fibrillation with low ventricular rate.

Regional anaesthesia in form of neuraxial blockade i.e. spinal/epidural is associated with considerable hemodynamic imbalance^[14,15]. Further, the need for

preloading in neuraxial blockade increases the load on heart.

Similarly, inhalational agents not only reduce myocardial chronotropy and inotropy but also sensitize the myocardium to catecholamines, adversely affecting cardiac output and may lead to arrhythmias, warranting caution in their use.

Equianesthetic concentrations of volatile anaesthetic agents enflurane and halothane depress myocardial contractility to similar degree. In contrast isoflurane produces less myocardial depression than does halothane or enflurane. The negative inotropic actions of isoflurane and halothane are exacerbated by hypocalcemia, β_1 -adrenoceptor antagonists and can be reversed by administration of exogenous calcium, cardiac phosphodiesterase fraction III inhibitors, β_1 -adrenoceptor agonists, calcium channel agonists, and myofilament calcium sensitizers.

Conclusion:

Keeping in mind the above, we decided to insert transvenous temporary pacemaker. The patient was managed with low concentrations of isoflurane. Greater than routine doses of opioid analgesic were used, finely balancing the dose before and after delivery of the fetus, to reduce the requirement of isoflurane. Drugs such as atropine, isoproterenol, milrinone as well as external defibrillator were kept ready.

Since altered hemodynamics can contribute to the patient's symptoms during pregnancy, the patient should be reassessed in the postpartum period before permanent pacemaker implantation is contemplated^[4].

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Medical Humor

A man asked his doctor if he thought he'd live to be a hundred. The doctor asked the man, "Do you smoke or drink?"

"No," he replied, "I've never done either."

"Do you gamble, drive fast cars, and fool around with women?" inquired the doctor.

"No, I've never done any of those things either."

"Are you a some kind of a religious person?"

"No, I don't believe in anything."

"Well then," said the doctor, "what do you want to live to be a hundred for?"