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Case Report

A successful pregnancy outcome in a patient with cardiac permanent pacemaker

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ABSTRACT

We present a case of 31 years old Gravida 2 Abortion 1 at 25 weeks of gestation with history of congenital heart disease-Left aorto-ventricular tunnel, for which she had intracardiac repair at 7 years of age. She had bradycardia, syncopal attacks, diagnosed as complete heart block at 26 yrs of age and had permanent pacemaker implantation had come for antenatal care. Echocardiogram showed ejection fraction of 30%, global hypokinesia of left ventricle and moderate aortic regurgitation. Patient was asymptomatic. As per cardiologist opinion, started on Tab. Amiodarone 100mg once daily on alternate days and pregnancy continued. Patient was admitted at 38wks, for elective lower segment caesarean section, in view of cardiac condition, pacemaker adjustment done before anaesthesia. Under general anaesthesia, delivered an alive boy baby of birth weight 3.2 kg with a good Apgar score. Intraoperative and postoperative period was uneventful. At postoperative follow-up, patient was asymptomatic. Hence, we report a successful pregnancy outcome despite critical ejection fraction in a pregnant patient with permanent pacemaker.

Keywords: Complete heart block, Permanent pacemaker in pregnancy

INTRODUCTION

Pregnancy in patients with cardiac pacemakers is possible but requires a multidisciplinary approach to antenatal care. Normal physiologic changes of pregnancy need to be considered in the management of the pregnant woman with a pacemaker.[1] We present a case of a patient with a pre-existing pacemaker, who presented at 25 weeks gestation with severe left ventricular dysfunction with critical ejection fraction.

CASE REPORT

A 31-year-old Gravida 2 abortion 1 had registered at our facility at 25 weeks of gestation. She was a known case of congenital heart disease-Aorta left ventricular tunnel (Figure 1). At 7 years of age, had underwent intracardiac repair, closure of opening of left ventricle, aortic tunnel through left ventricle and plication of tunnel sac through right ventricular outflow tract. She was on regular follow up with cardiologist. First pregnancy was in 2018 before pacemaker implantation, which was spontaneous abortion at 2 months amenorrhoea, medically managed.

She had bradycardia and syncopal attack, diagnosed as complete heart block, 1 year after first pregnancy. Permanent pacemaker implantation (Figure 2) done on October 2019. Present pregnancy was a spontaneous conception booked elsewhere till 25 weeks. Early pregnancy scan done showed dates corresponding. NT Scan: Normal. Double markers done showed low risk for trisomy 13,18,21. Immunized with 2 doses Inj.dT. Was on iron, calcium supplements. Anomaly scan done: No gross anomalies. Fetal ECHO: Normal. Glucose tolerance test at

24 weeks was within normal limits. ECG (Figure 3) showed atrial sensed ventricular paced rhythm. ECHO (Figure 4) at 25 weeks gestation showed Pacemaker leads in right atrium and right ventricle, global hypokinesia of left ventricle, dilated left ventricle with severe ventricular dysfunction, moderate aortic regurgitation with critical EF: 30%.

Cardiologist opined to continue pregnancy and started on tab amiodarone 100 mg once daily on alternate days. Interval growth Scan at 28 weeks showed a single live fetus with adequate liquor and estimated fetal weight of 1.2 kg. She was on weekly follow up with cardiologist and obstetrician. At 30wks, in view of elevated postprandial sugars, started on medical nutritional therapy and sugars monitored. Steroid prophylaxis was given. Patient was asymptomatic throughout.

Scan at 37 weeks showed estimated fetal weight of 3 kg. At 37+5 weeks of gestation, admitted for elective lower segment caesarean section. On admission, her vitals were pulse rate 90 bpm, blood pressure 120/70 mmHg. Pacemaker settings (Figure 5) were adjusted preoperatively.

Under General anaesthesia, elective lower segment caesarean section was done after obtaining high risk consent. Intraoperative period was Uneventful. Delivered a well-baby of birth weight 3.2 kg and Apgar: 8/10,9/10. Post operatively patient was shifted to intensive critical care unit.

Postoperatively pacemaker settings were reset to her original settings. Continuous cardiac monitoring done. Tab amiodarone was stopped. Remained asymptomatic and continuous vital monitoring done. Breastfeeding was deferred for a month, since patient was on amiodarone antenatal and started breastfeeding after a month. Patient was asymptomatic on postoperative follow up till 6 weeks. Contraceptive advice given.

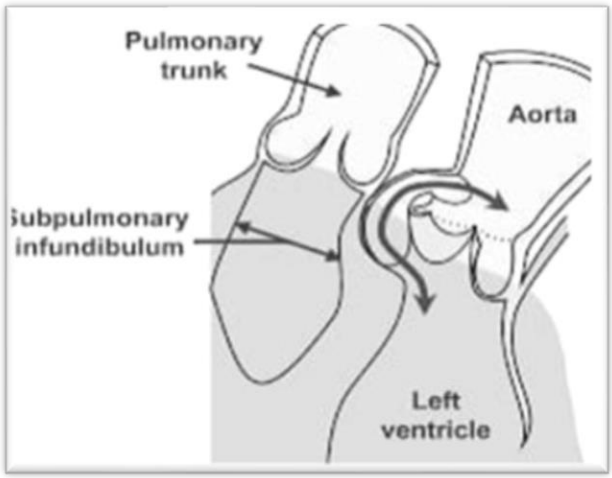

Figure 1: Left aorto left ventricular tunnel.

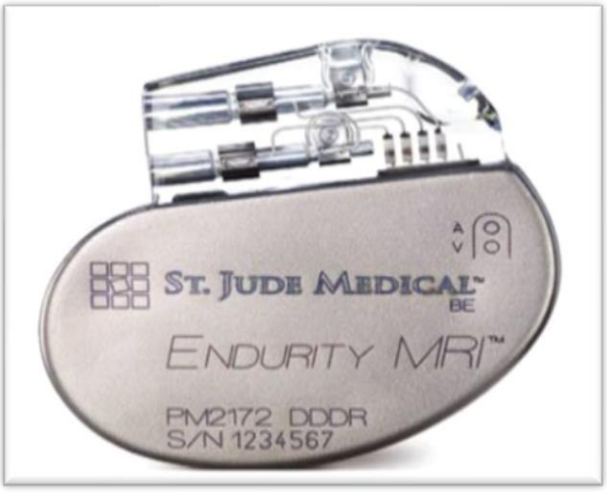

Figure 2: Dual chamber rate modulated pacemaker.

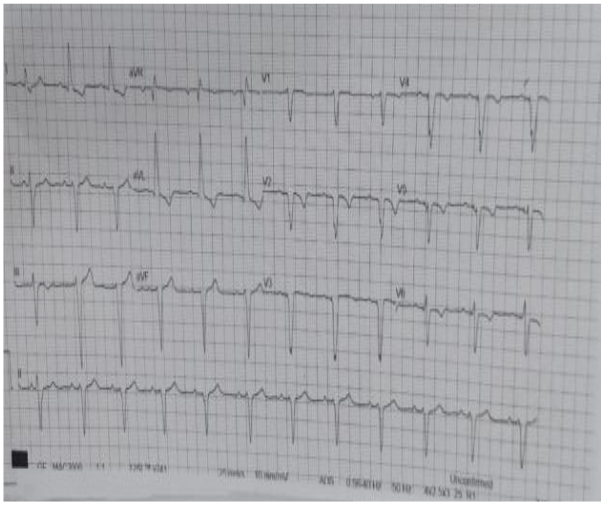

Figure 3: ECG showing atrial sensed ventricular paced rhythm.

Figure 4: Echocardiogram findings.

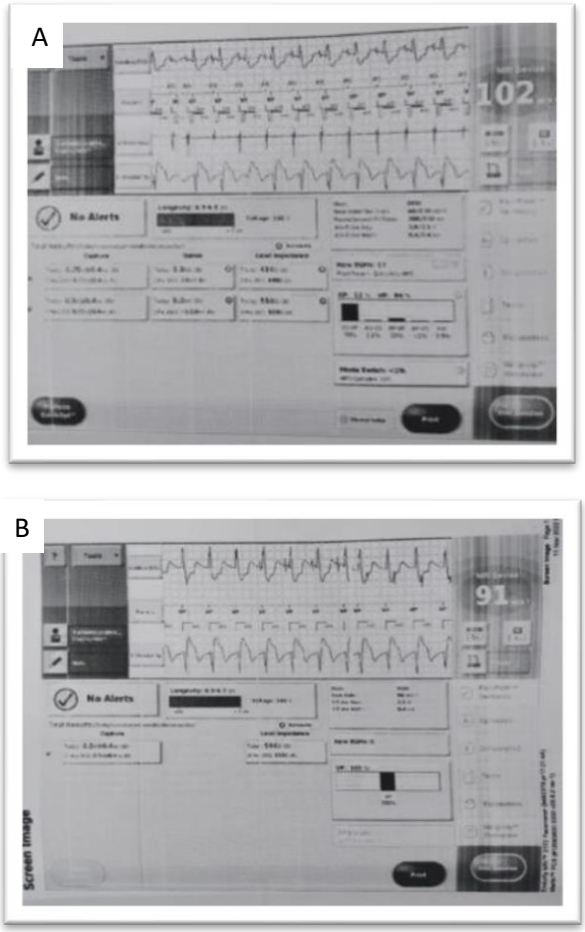

Figure 5 (A and B): Preoperative pacemaker settings.

DISCUSSION

Management of pregnancy with pacemaker in situ is challenging as pregnancy is associated with a variety of cardiovascular physiologic changes. Blood volume normally increases during pregnancy, with an estimated 30% increase from baseline near term.[2] Cardiac output rises in pregnancy to about 30% above non-pregnant levels. Early on, this is primarily due to an increase in stroke volume, but later is also associated with an increased heart rate. A drop in cardiac output can be demonstrated late in gestation, mainly as a function of reduced venous return due to inferior vena cava compression by the enlarged uterus.[3]

Pacemakers consist of 2 basic parts, the pulse generator, and electrode leads. Permanent pacemaker leads are usually placed transvenously through the cephalic, axillary or subclavian veins. Pacemakers can be programmed externally with radio waves from a pacemaker programmer.[4] Our patient had DDDR (Dual chamber rate modulated) pacemaker, which enables pacing and sensing capabilities in both ventricles and atria. With regard to routine care, co-management with the cardiology service is required. Either before the pregnancy or early in the first trimester, ECG and echo cardiogram and baseline pacemaker interrogation can be done to know about pacemaker dependency. Throughout the pregnancy, attention should be paid to any new onset of symptoms such as palpitations, shortness of breath, syncope, dizziness, confusion, and exercise intolerance.[5] Our patient was asymptomatic throughout the pregnancy. Routine anticoagulation is not recommended in patients with pacemakers, unless additional risk factors are identified. Delivering with a pre-existing pacemaker is a low-risk event and not a contraindication for vaginal delivery.[6] Pacemakers do not interfere with antepartum or intrapartum external fetal heart rate monitoring. This is because these are ultrasonographic modalities that do not compete electronically with the pacemaker device.[7]

In patients undergoing caesarean delivery, care must be taken to recognize early signs of reduced cardiac output and any pacemaker dysfunction on ECG. Additionally, any electrolyte imbalance must be corrected before anesthesia as both hypokalemia or hyperkalemia can alter the pacing threshold.[8] While selecting the type of anaesthesia for surgery, it is better to avoid any maternal hypotension as it can compromise uteroplacental blood flow, which has adverse effects to both mother and baby.[9]

During Caesarean delivery, only bipolar electrocautery should be used, and in very short bursts, to avoid interference with pacemaker output and inappropriate resetting of the device.[10] Reprogramming of the pacemaker to an asynchronous mode is protective against electromagnetic interference and is generally only done for pacemaker dependent patients. As a routine precaution, the grounding plate for the cautery system should be placed as close as possible to the operating site, and as far as possible away from the pacemaker.[11,12] In order to avoid dysfunction of pacemaker during caesarean delivery, it is better to change the pacemaker continuous asynchronous pacing mode (VOO) by programming preoperatively, as we did it in our patient.

CONCLUSION

Pregnancy in patients with pacemakers requires a multidisciplinary approach to antenatal care. Route of delivery is generally based on obstetric indications although our patient required caesrean delivery. Our case implies that successful pregnancy outcome is possible with permanent pacemaker

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