

DOI: <https://dx.doi.org/10.18203/2320-1770.ijrcog20233314>

Case Report

Caesarean section under spinal and epidural anesthesia in complete atrioventricular block without a pacemaker: a rare case report

Vineet V. Mishra, Priyanka H. Rane*, Sumesh Choudhary, Kunur N. Shah

Department of Obstetrics and Gynecology, Institute of Kidney Diseases and Research Centre, Ahmedabad, Gujarat, India

Received: 18 September 2023

Accepted: 07 October 2023

*Correspondence:

Dr. Priyanka H. Rane,

E-mail: pborole26@gmail.com

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ABSTRACT

Complete heart block (CHB) during pregnancy is rarely encountered. Management requires a multidisciplinary approach involving the obstetrician, cardiologist, anesthetist, and neonatologist. Treatment varies from medical management to temporary or permanent pacemaker insertion. Complete atrioventricular block comprises complete absence of AV conduction - none of the supraventricular impulses are conducted to the ventricles. Perfusing rhythm is maintained by a junctional or ventricular escape rhythm. Typically, the patient will have severe bradycardia with independent atrial and ventricular rates. The incidence is 1 in 15,000 to 20,000 live births. We successfully managed caesarean section in a pregnancy with complete atrioventricular block under spinal and epidural anesthesia without a pacemaker. Asymptomatic pregnant women with congenital complete atrioventricular block can tolerate caesarean section under spinal and epidural anesthesia without a pacemaker.

Keywords: Complete atrioventricular block, Bradycardia, Caesarean section, Pregnancy

INTRODUCTION

Complete heart block (CHB) is defined as disruption of electrical excitation in the atrioventricular conduction system. CHB is generally classified as congenital or acquired; the former is associated with heart malformations or maternal autoimmune disease, and the latter is derived from cardiac surgery, rheumatic heart disease, ischemic heart disease or an infective disorder.¹

In severe cases with clinical symptoms, pacemaker implantation becomes necessary. Pregnancy itself induces changes in hemodynamics, and pregnant women with CHB without a pacemaker, especially those with acquired CHB, may experience drastic changes in hemodynamics, requiring careful management.

We report caesarean section in a woman with congenital CHB without implanting a pacemaker in spinal and epidural anesthesia.

CASE REPORT

A 36-year-old primigravida with spontaneous conception was presented at 32 weeks of pregnancy at Obstetrics and Gynaecology OPD of Institute of kidney disease and research centre, Ahmedabad. Her LMP was 13/5/2021 and EDD was 20/2/2022, because of complete heart block she was considered high risk. Her height and weight were 153 cm and 48 kg (increased to 57 kg during pregnancy), respectively. Patient consulted a cardiologist for bradycardia (pulse-46/min) during antenatal examination on 1/7/21 at 6 weeks of pregnancy. Patient was asymptomatic (NYHA grade I). Electrocardiography (ECG) and 2D Echo was done (Figure 1).

Initial ECG findings showed Mobitz Type II AV block, narrow QRS complex with junctional escape rhythm as shown in Figure 1.

Complete blood count (CBC), liver function test (LFT), renal function test (RFT), electrolytes and TFT (thyroid

function test) were normal. 2D Echo was normal with LVEF 60%.

Holter monitoring was done s/o complete heart block, no e/o ventricular tachycardia (VT)/supraventricular tachycardia (SVT) and no e/o atrial fibrillation/atrial flutter. Patient was advised medical management with hematinics and follow up after delivery by cardiologist. Pacemaker will be required if patient develops chest pain, breathlessness or giddiness.

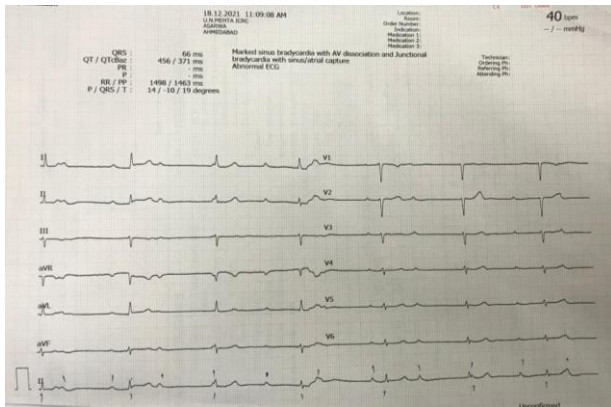


Figure 1: ECG findings showing Mobitz type II AV Block and narrow QRS complex.

Ultrasonography (USG) findings at 32 weeks showed single live intrauterine fetus with cephalic presentation and fundus posterior placenta, adequate liquor and umbilical artery Doppler was normal. Fetal weight was 2138 gms. Fetal echocardiography showed no abnormalities.

She had no restriction on exercise in daily life. Patient was COVID-19 RT PCR positive at 36 weeks and was admitted for observation and conservative management.

At 37-weeks decision of delivering the fetus was taken in view of maternal cardiac disease.

Treatment

Patient was induced by cerviprime gel. Decision of caesarean section was taken due to failure of induction.

High risk consent was taken. All the necessary equipments such as defibrillator, pacing equipments and emergency drugs such as isoprenaline, noradrenaline, adrenaline, and phenylephrine were kept ready.

Epidural catheter was secured. Patient underwent caesarean section at 37 weeks under spinal and epidural anesthesia. Intra op vitals were HR - 42/min, BP -100/70 mm of Hg. 1 lit Ringer’s lactate solution was given intraoperatively. Urine output was 200 ml with blood loss 400 ml. A male child delivered weighing 2490 gms with Apgar score of 8 and 9 at 1 and 5 mins respectively.

Outcome and follow-up

Her postoperative hemodynamic status was stable, she had bradycardia (pulse - 38-40 bpm) and normal blood pressure. She was kept under observation in postoperative recovery room and she was transferred to the general ward a day after surgery.

Cardiology reference was done after delivery on post op day 4. 2D Echo was done which was normal with LVEF 55%. Patient was discharged with stable haemodynamics on day 5 on antibiotics, antacids and analgesics. The newborn had no rhythm disturbance or congenital heart disease and was discharged on the same day. Patient was asked for follow up after 7 days and cardiology routine follow up as advised by cardiologist.

Table 1: Post-operative course.

POD	Pulse /min	BP mm of hg	Temp F	Per vaginal bleeding	Input ml	Urine output ml
0	36	100/60	98	Nab	1100	900
1	42	110/70	98.8	Nab	1000 + oral liquids	1300
2	38	110/60	99	Nab	Soft diet	1600
3	40	110/70	98.1	Nab	Full diet	4 times
4	42	120/60	98.2	Nab	Full diet	5 times
5	44	110/70	98.3	Nab	Full diet	5 times

DISCUSSION

The incidence of complete heart block is estimated to be 1 in 15,000 to 20,000 live births.¹ It can be congenital or acquired. However, the congenital variety is seen during pregnancy as the acquired type usually presents after 50 years of age.¹

Pregnancy is characterized by an increased circulating plasma volume and cardiac output compared with the

nongravid state. When pregnancy is complicated by CHB, heart failure symptoms may worsen as pregnancy progresses; thus, management is necessary.²

Perinatal outcome in CHB includes increased risk of inherited cardiac genetic disorders, fetal growth restriction, premature delivery. These complications also increase the risk of antenatal and perinatal mortality.

Temporary pacemakers have been routinely inserted for those pregnant patients without having permanent pacemaker. However, its necessity has not yet been discussed enough.³

During labour propped position, O₂ administration, avoidance of ARM, prophylactics antibiotics to avoid puerperal endocarditis is needed. In complete heart block stroke volume decreases and heart rate cannot be increased leading to reduced cardiac output and reduction in organ perfusion leading to uteroplacental insufficiency. So it is necessary to maintain euvolaemia.

Sympathetic response to pain and anxiety elevate heart rate and blood pressure. Tendency to delay in second stage of labour is to be curtailed by ventouse delivery. Conventional management is to be followed. Inj. Oxytocin can be given by infusion for excess bleeding accompanied by intravenous Frusemide to avoid heart failure. Intravenous Ergometrine should be withheld to prevent sudden overloading of heart.

Steroidal contraception is contraindicated as it may precipitate thrombo-embolic phenomenon. Barrier method is the best.⁴ In women without a permanent pacemaker, temporary pacemakers have been routinely inserted for labour and birth probably to withstand any haemodynamic variations.⁶

A pacemaker is indicated in the presence of symptoms (chest pain, dyspnea, syncope, palpitations), Q-T interval prolongation, wide QRS complex, ventricular dysfunction, or heart failure.⁷ Vaginal delivery is not contraindicated. Caesarean section is reserved for obstetric reasons and in those with intractable heart failure. Asymptomatic women

who responded to exercise or atropine by an increase in heart rate can be managed without pacemaker.^{2,3}

Studies suggested that regional anaesthesia is safe in pregnant women with cardiac disease undergoing caesarean section. Although the risk of hypotension is less with epidural technique, it may not be suitable in emergency situations with time constraints.^{7,8}

Drugs like Labetalol (for preeclampsia) and Nifedipine (for preterm labour) which are commonly used otherwise are contraindicated as they may aggravate heart block. Rarely preterm birth and intrauterine growth restriction has been observed. In most cases, no neonatal heart block had been seen. Few asymptomatic women without pacemakers may present with sudden cardiac death or heart failure during pregnancy, or may become symptomatic during labour due to Valsalva induced bradycardia.⁹

Need for pacemaker during pregnancy is debatable. Newly diagnosed cases of asymptomatic CHB in late pregnancy should be worked up for chronotropic responsiveness using atropine and responsive cases may be managed without pacemaker with emergency arrangements for pacing available.^{10,11}

Others suggest that temporary pacing should be done in patients with atropine resistant bradycardia, first and second degree AV block, complete heart block and atrial fibrillation with low ventricular rate.¹²

As sometimes syncopal attacks could be life threatening, pacing should be done early in pregnancy as it may significantly reduce morbidity and mortality.¹³

Table 2: Criteria for admission.⁴

Elective	Emergency
NYHA grade I – at least 2 weeks prior to EDD	Deterioration of functional grading
NYHA grade II – at 28th week in case of unfavorable social surroundings	Appearance of dyspnoea or cough or basal crepitations or tachyarrhythmia's
NYHA grade III and IV – as soon as pregnancy is diagnosed. Patient should be kept in hospital throughout pregnancy	Appearance of any pregnancy complication like anemia, preeclampsia

Table 3: Treatment will be determined by type, location and severity of heart block and the symptoms.⁵

Degree of heart block	Treatment
First-degree block	No treatment is indicated.
Second-degree block	Conservative management is recommended and pacemaker insertion is rarely indicated if do not respond to medical management
Third-degree block	Requires pacemaker insertion in symptomatic patients

CONCLUSION

Management of pregnancy might be safely contemplated without temporary pacing in asymptomatic women with CHB who demonstrate chronotropic responsiveness to

atropine. Patients who are asymptomatic but are not responsive to atropine can be managed with or without temporary pacemaker with readiness to insert temporary pacing during labour. Symptomatic patients should be managed with temporary pacing. Vaginal delivery is not

contraindicated and operative vaginal delivery is preferred.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

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Cite this article as: Mishra VV, Rane PH, Choudhary S, Shah KN. Caesarean section under spinal and epidural anesthesia in complete atrioventricular block without a pacemaker: a rare case report. *Int J Reprod Contracept Obstet Gynecol* 2023;12:3382-5.