

## Anesthetic Management of Patients with Congenital Complete Heart Block: A Continuing Dilemma?

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### ABSTRACT

Congenital complete heart block can present to us most commonly for management of obstetric surgeries. Anaesthetic management of such patients should be focussed on preventing bradycardia and maintaining hemodynamic stability. Preoperative placement of pacemakers in these patients is still controversial. No clear guidelines exist for the perioperative management of such patients. Here we report our experience with the perioperative management of a patient with congenital complete heart block for emergency caesarean section.

**Keywords:** Congenital heart block; Pacemaker; Perioperative; Bradycardia

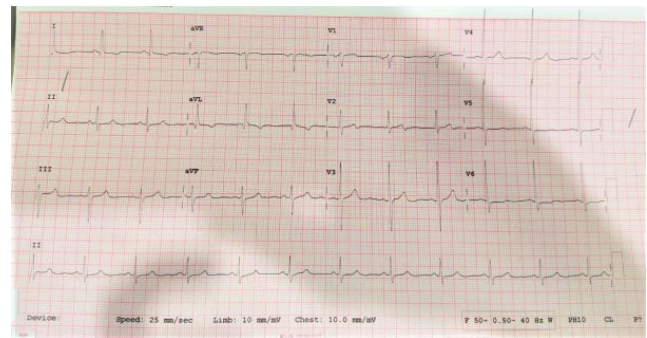
### INTRODUCTION

Congenital Complete Heart Block (CCHB) is a rarely encountered condition in pregnant patients. Patients often are asymptomatic [1-4]. No clear guidelines exist for the perioperative management of these patients. A multidisciplinary approach is needed for the successful management of these cases. The possibility of sudden cardiac death in these patients should always be thought about. Awareness of this condition and suspicion in a patient with slow heart rate will help diagnose this condition and prevent complications. We present a case of a lady with CCHB for emergency Lower Segment Caesarean Section (LSCS).

### CASE REPORT

A 21 years old primigravida was referred to our center in view of persistent bradycardia detected during her routine antenatal care. She was asymptomatic and did not give any significant medical or surgical history. After complete evaluation she was diagnosed as a case of congenital complete heart block. As she was asymptomatic, she was advised conservative management with the plan of placing a temporary pacemaker if need arises.

At 37 weeks of pregnancy she was admitted and induced under strict monitoring. As her labour failed to progress she was posted for emergency caesarean section. Her ECG showed complete heart block and echocardiogram was normal. After preanesthetic checkup, she was advised to undergo temporary pacemaker placement (Figure 1).



**Figure 1:** Electrocardiogram of the patient with congenital complete heart block.

Our anesthetic plan was to use general anesthesia with rapid sequence induction and endotracheal intubation. The pacemaker was inserted through the right femoral vein and heart rate set at 70/mt. She was induced with Inj. Propofol 100 mg, intubated with Inj. Succinylcholine and maintained on isoflurane, oxygen, air and Inj. Atracurium. Fentanyl, paracetamol and tramadol were given for analgesia. The intraoperative period was uneventful. At the end of surgery she was reversed with neostigmine and glycopyrrolate and extubated. The pacemaker was removed on second postoperative day and she was discharged three days later.

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## RESULTS AND DISCUSSION

Complete heart block can be congenital or acquired. The acquired AV conduction blocks can be caused by the fibrosis of the conduction system, ischemic heart disease, and the use of negative chronotropic and dromotropic drugs, increased vagal tone, valvular heart diseases, cardiomyopathies, electrolyte disturbances and autoimmune diseases. The most common cause of acquired block is surgery on the heart. Complete congenital heart block can either occur as an isolated condition or along with other congenital heart disease. Up to 85%-90% of patients with isolated CCHB survive well into the adulthood even when unpaced and many of these remain undiagnosed as they are asymptomatic [5].

Pregnancy is associated with several physiological changes in the cardiovascular system to meet the increased demands. There is a rise in stroke volume and heart rate and a fall in systemic vascular resistance during pregnancy. This physiological increase in heart rate fails to happen in a patient with complete heart block leading to decompensation and intolerance to pregnancy. Even if the patients remain asymptomatic during pregnancy, they may decompensate in the intrapartum or postpartum period. The block maybe present at any level of the conducting system. If the block occurs at the level of Atrio Ventricular Node (AVN), it is more benign, the heart rate is around 40-50/mt, with narrow QRS complexes and rate responds to exercise and drugs. If the block is distal to ANV, the prognosis is poor, heart rate is 30-40/mt, with wide QRS complexes and there is no response to exercise and drugs. Inserting pacemakers preoperatively in pregnant patients is controversial. Patients who remain stable during pregnancy are managed conservatively with temporary pacemakers placed at the time of labour or surgery. Symptomatic patients are advised permanent pacemaker placement in the antenatal period. Study by Michaelsson et al., [6] showed increased cardiac morbidity in asymptomatic patients and they recommended prophylactic pacemaker placement even for symptom-free adults with CCHB because of the high incidence of unpredictable Stokes Adams attacks with considerable mortality from first attacks. Temporary pacemakers can be placed to prevent bradycardia in order to compensate for the high output demands during intrapartum and postpartum periods. Caesarean section should be reserved for obstetric indications. Bradycardia, hypotension, cardiac arrest and sudden cardiac death can occur during the intraoperative period. The anesthetic goal should be to maintain the hemodynamic stability and the anesthetic technique and the drugs chosen must have minimal interference with the heart rate. No clear guidelines exist for perioperative management of these patients. There are case reports of LSCS being performed under spinal, epidural and general anesthesia [7-10], with or without placement of temporary pacemakers. Subarachnoid block can cause hypotension and bradycardia and the level of block is often

difficult to control. So we chose general anesthesia and the temporary pacemaker placement was done to compensate for the hemodynamic changes that could occur during anesthesia and postpartum period.

## CONCLUSION

The placement of temporary pacemakers is not free of complications and can lead to complications like infection, embolism and bleeding and exposes the patient to radiation. They can malfunction unexpectedly. Close cardiac monitoring should extend into the postpartum period as well. There are reports of maternal mortality one month after delivery. In one report the patient became symptomatic after delivery when temporary pacemaker was removed necessitating a permanent pacemaker. Thus, it is necessary to assess the clinical symptoms and cardiac status even in patients who had an uneventful pregnancy and delivery. Reports of successful perioperative management of the cases of congenital complete heart block can help make a consensus on the protocol for management of such patients.

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