

Congenital complete heart block and spinal anaesthesia for caesarean section

Address for correspondence:

Dr. S Parthasarathy,
Department of
Anaesthesiology, Mahatma
Gandhi Medical College and
Research Institute, Puduchery,
South India.
E-mail: painfreepartha@gmail.
com

A Umesh Kumar, R Sripriya, S Parthasarathy, B Amirtha Ganesh, M Ravishankar
Department of Anaesthesiology, Mahatma Gandhi Medical College and Research Institute, Puduchery, India

ABSTRACT

Congenital complete heart block could be absolutely asymptomatic. Increased awareness of suspecting an atrioventricular heart block in patients with slow heart rate and electrocardiograph examination will ensure recognition of this problem. The possibility of sudden cardiac death in these patients should not be forgotten. The goal in the peri-operative anaesthetic management is to preserve the heart rate and maintain haemodynamic stability. Herein, we present a case of congenital complete heart block posted for elective caesarean section for an obstetric indication. We would like to highlight the advantage of bupivacaine–fentanyl combination in maintaining haemodynamic stability and peri-operative heart rate control with temporary pacemaker.

Key words: Complete heart block, fentanyl, pregnancy, spinal anaesthesia

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INTRODUCTION

Complete heart block in children and young adults is usually congenital. It may either be an isolated finding or be associated with other heart diseases. It may be acquired due to surgeries for congenital heart disease. Parturient with congenital heart block may be asymptomatic but can present with sudden vascular collapse, especially during labour. Few patients with congenital heart block may have sudden cardiac death (SCD) for which there are no predictors.^[1] We present our experience of spinal anaesthesia in a 29-year-old female with congenital complete heart block for lower segment caesarean section (LSCS).

CASE REPORT

A 29-year-old parturient (Gravida 3, Para 0, Abortion 2) was admitted to our hospital with 9 months of amenorrhea. She was a known case of congenital complete heart block. She had undergone appendectomy 8 years back under spinal anaesthesia, and the procedure was uneventful. Past obstetric

history revealed two abortions and an episode of perioperative seizures during intravenous sedation for medical termination of pregnancy. The episode was associated with bradycardia non-responsive to atropine, during which she was evaluated as having a congenital complete heart block. She had been prescribed orciprenaline by a local practitioner and had received orciprenaline 10 mg BD for 2 months preceding the present pregnancy and till 10 days before presenting to the hospital. It was stopped by our cardiologist as it does not help to increase heart rate in complete heart block. Her antenatal period so far was uneventful. There was no history of syncopal attacks.

She was admitted for elective LSCS, the indication being oligohydramnios. On admission, her general condition was stable; pulse rate was 46/min and blood pressure (BP) was 110/70 mmHg. Clinically, cardiorespiratory and central nervous system examinations were normal. Per-abdomen examination showed a foetus in cephalic presentation, uterine height at 38 weeks, foetal heart rate 136 beats/min and regular with clinical and ultrasonographic evidence of

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reduced liquor. Basic routine laboratory investigations were normal. Electrocardiography showed a complete heart block with an atrial rate of 80/min, ventricular rate of 46/min and a narrow QRS complex [Figure 1]. Echocardiography revealed structurally normal heart with a mild TR. She was accepted for anaesthesia under ASA II and was explained about the anaesthetic technique. Patient was kept nil oral for 8 h. Tab. Ranitidine 150 mg was given on the previous night followed by Tab. Ranitidine and 150 mg Tab. Metoclopramide 10 mg the next morning 2 h before the surgery. On the morning of the surgery, the patient was taken for cardiac catheterization in supine position with a wedge under the right buttock and temporary pacemaker insertion (Ventricular, Ventricle Inhibition – VVI) was done through the right cubital vein. The position of the lead in the right ventricle was confirmed by fluoroscopy, with a lead shield cover over the abdomen of the patient. The pacemaker was set in a demand mode of 50/min. A pacemaker can also be inserted using electrocardiographic and echocardiographic guidance to avoid foetal exposure to ionizing radiation, but our cardiologist could not get enough window to do the same. Immediately after the procedure, the patient was taken for the elective caesarean section under spinal anaesthesia. The patient was pre-loaded with 750 mL of Ringer's lactate solution. A spinal anaesthesia was given in the L3-L4 interspace with a total of 1.5 mL, which is a combination of a 1.0 mL hyperbaric 0.5% bupivacaine with 0.5 mL fentanyl (25 µg). A spinal level of T-6 was achieved. Intra-operatively, the first episode of hypotension after the spinal anaesthesia was treated by increasing the pacing rate to 70 beats/min and the second episode was treated by 3 mg of intravenous (IV) ephedrine. A healthy male baby weighing 2.5 kg was born with an Apgar score of 8/10 in the 1st minute and 9/10 in the 5th minute. A total of 1.5 L of Ringer's lactate was given intra-operatively. Post-operatively,

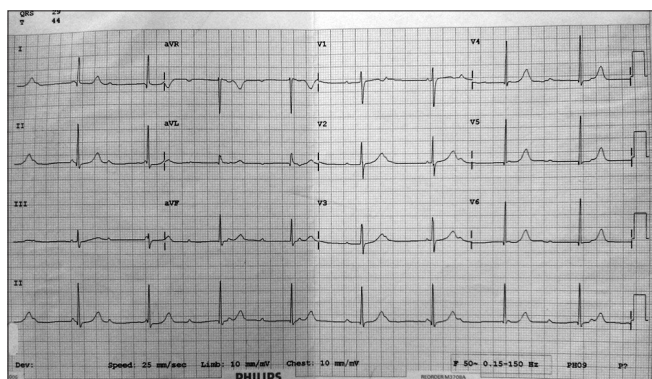


Figure 1: ECG showing congenital heart block

the pacemaker rate was changed to 60 beats/min and the patient was shifted to the post-operative ward for continuous monitoring. Post-operative pain relief was achieved with IV tramadol 50 mg and diclofenac 75 mg IV alternatively 8th hourly. The temporary pacemaker was removed after 24 h and the patient was haemodynamically stable after the removal. Her post-natal period was uneventful and she was discharged on the 5th day with an advice for the placement of permanent pacemaker as early as possible.

DISCUSSION

Heart block may be congenital or acquired. Congenital heart block may occur alone or in association with other cardiac abnormalities. The history of congenital complete heart block begins *in utero*. Foetal echocardiography establishes the diagnosis. Only 14% of foetuses with coexisting congenital heart disease survive as neonates. Conversely, in isolated complete heart block, 85–90% of all births live beyond the neonatal period, even up to late adulthood.^[2] If congenital complete heart block occurs alone, then it is relatively benign, as the block to conduction is at the level of the AV node. The ventricular pacemaker is proximal to the bifurcation of the bundle of His, and therefore the QRS complexes are narrow, and the ventricular conduction system intact. The rate is relatively high and can vary from 40 to 80 beats/min, and may increase with exercise, atropine or sympathomimetics. However, sudden death may occasionally occur for which there are no predictors. Acquired heart block may be acute or chronic. Acquired heart block in children or early adulthood is mostly secondary to cardiac surgery involving closure of perimembranous or infundibular ventricular septal defect (VSD) or muscle bundle resection near the conduction tissues, but can occur as an isolated condition also.^[2] In the chronic type, acquired heart block, the defect is more distal in the conducting system. The atrio ventricular (AV) junction or bundle branches are usually involved, the QRS complexes are wide and the heart rate is lower and is not increased by exercise or atropine. The prognosis is generally worse, but ultimately depends on the underlying cause. Ours is a case of congenital complete heart block with no significant cardiac symptoms.

Prophylactic placement of a pacemaker is not indicated in an asymptomatic pregnant patient with complete heart block as it does not cause unusual

problems.^[3-5] If the patient is symptomatic during her first and second trimesters, then the placement of a permanent pacemaker is indicated. We used temporary pacing in this patient because the patient's heart rate was resistant to exercise and atropine, and the same cannot adapt to her changing BP. Increase in the heart rate during labour is essential to increase in the cardiac output and to maintain the haemodynamics, which is not possible in the patient. Hence, for a safe delivery, temporary pacemaker insertion was essential, which ideally we did before operative delivery.

There are quite a few anaesthetic problems in patients with complete heart block undergoing incidental surgeries. These include bradycardia, hypotension, arrhythmias, cardiac arrest or even sudden death. The anaesthetic technique that least alters the cardiac stability should be wisely planned and executed for the procedure. General anaesthesia carries a potential risk to these patients because both the inhalational and the intravenous agents alter the haemodynamics to such an extent to put them in peril.^[6-8] If general anaesthesia is planned, drugs with minimal effects in depressing the heart rate have to be preferred, such as ketamine for induction, pancuronium for relaxation and isoflurane for maintenance. Combined spinal epidural is another option, but we did not opt for it due to cost constraints and brevity of surgery. Modi *et al.* successfully managed such a case with the epidural anaesthetic technique.^[9] In our patient, haemodynamic stability was maintained throughout the procedure because of intrathecal opioids. We opted for intrathecal opioids, especially fentanyl, which gives adequate anaesthesia with minimal effects on the cardiovascular system.^[10] We added 25 µg of fentanyl with almost half the usual dose of hyperbaric 0.5% bupivacaine. This was responsible for the near-avoidance of sympathetic blockade and hypotension. We did use 3 mg of vasopressor ephedrine, but such a single low dose to maintain adequate haemodynamic stability was found satisfactory to us.

We did insert a temporary pacemaker to compensate for any possible haemodynamic eventuality that can occur during anaesthesia, and the immediate post-partum period. Our aim was to prevent extreme

bradycardia. The pacemaker rate was set at 50/min in order to preserve her native rhythm till her blood pressure is maintained in the intra-operative period. Long-term pacing suppresses the native rhythm, and our intention was to avoid it. Also, the fluoroscopy time for positioning the lead was minimized to less than 10 s.

The patient was discharged with an advice for permanent pacemaker implantation (PPI). As per the recent guidelines, PPI is indicated for all congenital complete heart blocks (class 2a/b) as trials have shown that there is a subgroup of patients who may have SCD for which there are no predictors available.^[1] Hence, it is reasonable to consider PPI even if the patient is asymptomatic.

To conclude, we successfully managed a case of congenital complete heart block for operative delivery with temporary pacemaker *in situ* with intrathecal low-dose bupivacaine–fentanyl combination as the anaesthetic technique.

REFERENCES

1. Perloff JK. Isolated congenital heart block. In: Perloff JK, Editor. The clinical recognition of congenital heart disease. 5th ed. Philadelphia: Saunders; p. 46-8.
2. Reid JM, Coleman EN, Doig W. Complete congenital heart block. Report of 35 cases. *Br Heart J* 1982;48:236-9.
3. Dalvi BV, Chaudhuri A, Kulkarni HL, Kale PA. Therapeutic guidelines for congenital complete heart block presenting in pregnancy. *Obstet Gynecol* 1992;79:802-4.
4. Kenmure AC, Cameron AJ. Congenital complete heart block in pregnancy. *Br Heart J* 1976;29:911-3.
5. Csontos CS, Bogar L, Melczer L. Temporary pacemakers for non-cardiac surgery. *Eur J Anaesthesiol* 2003;20:575-88.
6. Clayton D. Asystole associated with vecuronium (Letter). *Br J Anaesth* 1986;58:937-8.
7. Starr NJ, Sethna DH, Estafanous FG. Bradycardia and asystole following the rapid administration of sufentanil with vecuronium. *Anesthesiology* 1986;64:521-3.
8. James MF, Reyneke CJ, Whiffler K. Heart block following propofol case report. *Br J Anaesth* 1989;2:213-5.
9. Modi PM, Butala B, Shah RV. Anaesthetic management of an unusual case of complete heart block for LSCS. *Indian J Anaesth* 2006;50:43-4.
10. Harsoor S, Vikram M. Spinal anaesthesia with low dose bupivacaine with fentanyl for caesarean section. *SAARC J Anaesth* 2008;1:142-5.

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