



## Anaesthetic Management of a Case with Congenital Complete Heart Block Posted for Lower Segment Caesarean Section

Varsha T, Vaijanath, and Chandra Sekhar CN\*

Department of Anaesthesiology, Pain Medicine and Intensive Care, Yashoda Superspeciality Hospital, Somajiguda, Hyderabad, India

\*Corresponding e-mail: [cncschandu@gmail.com](mailto:cncschandu@gmail.com)

### ABSTRACT

Complete heart block in pregnancy is relatively a rare problem. It may be congenital or acquired. Congenital complete heart block may be asymptomatic. Acquired causes may be secondary to cardiac surgery, rheumatic heart disease, infectious disorders. The goal in perioperative anaesthetic management of a case with complete heart block is to preserve the heart rate and maintain hemodynamic stability. Herein, we report the anaesthetic management of a case with congenital complete heart block using spinal anaesthesia and temporary pacemaker for elective lower segment caesarean section.

**Keywords:** Congenital complete heart block, Pregnancy, Spinal anaesthesia, Temporary pacemaker

### INTRODUCTION

A Parturient with congenital complete heart block may be asymptomatic but can present with sudden vascular collapse, especially during labour. Some of the complications which should be considered are bradycardia, arrhythmia, hypotension, cardiac arrest. Complete heart block is one of the serious cardiac conduction abnormality which necessitates a pacemaker implantation. We present the anaesthesia management using the spinal anaesthesia in a case of 28-year-old female with congenital complete heart block who presented at term for lower segment caesarean section.

### CASE REPORT

A 28-year-old female, a Gravida 3, Para 1, Live 1, Abortion 1, came to the hospital with term gestation. She is a known case of congenital complete heart block. She had undergone one previous lower segment caesarean section 7 years back under spinal anaesthesia with temporary pacing during the procedure. She had a history of pregnancy induced hypertension in the past pregnancy in the third trimester. She had regular antenatal check-up and was uneventful in the present pregnancy.

She was admitted for safe institutional delivery. Her pulse rate was 46 beats per minute, Blood pressure was 140/70 mmHg and general condition was stable on admission. The cardiorespiratory and central nervous system examinations were normal clinically. Per abdominal examination showed a foetus in cephalic presentation, foetal heart rate of 138 beats/minute and regular. Basic routine laboratory investigations were normal. Electrocardiography showed a complete heart block with a rate of 46/minute and narrow QRS complex. Echocardiography revealed ejection fraction of 62% with trivial MR and structurally normal heart. She was explained about the anaesthesia technique and kept nil per mouth for 6 hours (Figure 1).

The patient was taken for temporary pacemaker insertion which was done through the right internal jugular vein. Fluoroscopy was done to confirm the position of the lead in the right ventricle. The pacemaker was set a demand mode of 40 per minute. Immediately after the procedure spinal anaesthesia was given in the L3-L4 interspace with a total of 1.5 ml of 0.5% bupivacaine and 0.5 ml of Fentanyl (25 mcg). A spinal level of T10 was achieved. Intraoperatively there was no episode of hypotension and no vasopressors were required. A healthy male baby was born with Apgar of 5 in the 1st minute, 7 at the 5th minute, and 8 at the 10th min and weighing 2 kilograms. A total of 1.5 litres of Ringer's lactate was given intraoperatively. Patient was shifted to the surgical intensive care unit for continuous monitoring. The temporary pacemaker was removed in the first postoperative day and she was stable in postoperative period. She was discharged on the 6th postoperative day.



Figure 1 Electrocardiogram of case

### DISCUSSION

Heart block may be congenital or acquired. It is a conduction disorder. Congenital heart block may occur alone or in association with other cardiac abnormalities like transposition of the great vessels, a single ventricle and ventricular septal defect. 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 [1]. In the chronic type, acquired heart block, the defect is more distal in the conducting system.

Third degree AV heart block also known as complete heart block. It is complete interruption of the AV conduction. Continued activity of the ventricles is due to impulses from an ectopic pacemaker distal to the site of the conduction block. A conduction block near the AV node manifests with a heart rate usually about 45-55 beats per minute and narrow QRS complex. A conduction block below the AV node (infranodal) manifests with a heart rate usually about 30-40 bpm and wide QRS complex.

The history of congenital complete heart block begins in utero. Foetal echocardiography establishes the diagnosis. The incidence of complete heart block is 1 in 15,000 to 20,000 [2]. Only 14% of foetuses with coexisting congenital heart disease survive as neonates. In isolated complete heart block, 85-90% of all births live beyond the neonatal period, even up to late adulthood. About 30% of congenital heart blocks remain undiscovered until patient reaches adulthood and in female patient it may manifest during any stage of pregnancy.

Problems like bradycardia, hypotension, arrhythmias, cardiac arrest, sudden death can occur in patients undergoing incidental surgeries. Planning for anaesthesia technique which least alters the cardiac stability is essential [3]. General anaesthesia carries a potential risk as inhalational anaesthetics reduce the myocardial chronotropy and inotropy and sensitize myocardium to catecholamines [4]. Opioids like fentanyl and muscle relaxants like vecuronium have reports of causing bradycardia and asystole [5,6]. If general anaesthesia is planned then drugs like ketamine for induction, pancuronium for relaxation and isoflurane for maintenance can be preferred.

Modi et al. successfully managed such a case with the epidural anaesthetic technique [7]. Our case is a parturient with congenital complete heart block with no significant cardiac symptoms. During labour increase in heart rate is essential to increase the cardiac output and to maintain the hemodynamics [8]. This is not possible in this patient. Spinal anaesthesia is known to produce hemodynamic imbalance. The occurrence of asystole associated with spinal anaesthesia has been reported [9]. Hence, for a safe delivery, we inserted a temporary pacemaker to compensate for any hemodynamic changes.

Most pacemakers are sensitive to direct or indirect electromagnetic interference (EMI). Direct sources like electrocautery or indirect sources like mechanical ventilator are potential source of mechanical interferences that could affect pacemaker. Fatal arrhythmia and even death have been reported with the use of electrocautery leading to failure of pacemaker [10].

The pacemaker rate was set at a rate of 40 per 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. The patient was discharged with an advice for permanent pacemaker implantation (PPI). We used 25 µg of fentanyl with almost half the dose of hyperbaric 0.5% bupivacaine given usually for spinal anaesthesia. The near-avoidance of sympathetic blockade and hypotension could be possible with this.

### CONCLUSION

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, Joseph K., and Ariane Marelli. *Clinical recognition of congenital heart disease*. Elsevier Health Sciences, 2012.
- [2] Reid, John M., Eric N. Coleman, and William Doig. "Complete congenital heart block. Report of 35 cases." *Heart* 48.3 (1982): 236-239.
- [3] Dalvi, Bharat V., et al. "Therapeutic guidelines for congenital complete heart block presenting in pregnancy." *Obstetrics & Gynecology* 79.5, Part 2 (1992): 802-803.
- [4] Mohan, V. K., et al. "A patient with congenital complete heart block undergoing multiple exposures to general anaesthesia." *Anaesthesia and Intensive Care* 31.6 (2003): 667-671.
- [5] Clayton D. Asystole associated with vecuronium (Letter) *Br J Anaesth* 1986; 58: 937-38.
- [6] Starr, Norman J., Dhun H. Sethna, and F. G. Estafanous. "Bradycardia and asystole following the rapid administration of sufentanil with vecuronium." *Anesthesiology* 64.4 (1986): 521-523.
- [7] Modi, P. M., Beena Butala, and Veena R. Shah. "Anaesthetic management of an unusual case of complete heart block for LSCS." *Indian J Anaesth* 50.1 (2006): 43-44.
- [8] Kumar, A. Umesh, et al. "Congenital complete heart block and spinal anaesthesia for caesarean section." *Indian journal of anaesthesia* 56.1 (2012): 72.
- [9] Jordi, Eva-Maria, Stephan CU Marsch, and Stephan Strebel. "Third degree heart block and asystole associated with spinal anesthesia." *Anesthesiology: The Journal of the American Society of Anesthesiologists* 89.1 (1998): 257-260.
- [10] Rastogi, Shivani, et al. "Anaesthetic management of patients with cardiac pacemakers and defibrillators for noncardiac surgery." *Annals of Cardiac Anaesthesia* 8.1 (2005): 21.