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Case Report

Neonatal pacing for immune mediated complete heart block diagnosed antenatally at 27 weeks: a case report with successful outcome

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ABSTRACT

Congenital complete heart block (CCHB) is a rare condition, most commonly associated with maternal autoimmune antibodies such as anti-Ro/SSA. We report a case of antenatally diagnosed immune-mediated CCHB at 27 weeks' gestation in a 27-year-old gravida 2 woman with positive antinuclear and anti-Ro/SSA antibodies. Fetal echocardiography revealed complete heart block in a structurally normal heart with a ventricular rate of 55 bpm. The pregnancy was managed with maternal dexamethasone and hydroxychloroquine, with close fetal surveillance. A late preterm infant weighing 2.4 kg was delivered at 36 weeks and required permanent pacemaker implantation within 24 hours of life due to persistent bradycardia. The postnatal course was uneventful, and at 3-month follow-up, the infant demonstrated stable pacemaker function with appropriate growth and development. This case highlights the importance of early diagnosis, multidisciplinary perinatal management, and timely neonatal pacing in achieving favourable outcomes in immune-mediated CCHB.

Keywords: Congenital complete heart block, Neonatal pacing, Anti-Ro antibodies, Fetal bradycardia, Pacemaker

INTRODUCTION

Congenital complete heart block (CCHB) is a rare but serious condition, commonly associated with transplacental transfer of maternal anti-Ro/SSA antibodies.[1,2]

Affected neonates typically present with significant bradycardia and often require early intervention, including permanent pacemaker implantation.[5] Early diagnosis during pregnancy allows for appropriate perinatal planning and optimized neonatal outcomes.[4]

We report a case of antenatally diagnosed immune-mediated CCHB with emphasis on neonatal management and outcome.

CASE REPORT

A 27-year-old gravida 2 woman with a history of well-controlled hypothyroidism presented at 27 weeks' gestation with fetal bradycardia. Fetal heart rate was persistently around 55 beats per minute. Maternal evaluation revealed positive antinuclear antibodies (1:320, homogeneous pattern) and anti-Ro/SSA antibodies. Fetal echocardiography confirmed complete atrioventricular block in a structurally normal heart, with no evidence of hydrops. The pregnancy was managed with maternal dexamethasone and hydroxychloroquine, along with close fetal surveillance. The fetal heart rate remained stable between 50-58 bpm throughout the antenatal period. The patient also developed gestational diabetes mellitus and intrahepatic cholestasis of pregnancy, which were managed appropriately. An elective caesarean section was

performed at 36 weeks' gestation. A male infant weighing 2.4 kg was delivered with Apgar scores of 7 and 9 at 1 and 5 minutes, respectively. The neonate exhibited persistent bradycardia with a heart rate of 50-55 bpm and was transferred for specialized cardiac care. Electrocardiography confirmed complete atrioventricular block with narrow QRS complexes. In view of sustained bradycardia, early permanent pacing was planned.

Table 1: Timeline of perinatal and neonatal management.

Gestational age (weeks)	Clinical event	Fetal HR (bpm)	Management
20	Normal fetal ECHO	140	Routine care
27	Fetal bradycardia detected	55	Fetal echocardiography, ANA testing
27	CCHB diagnosis confirmed	55	Dexamethasone 4 mg daily initiated
28	GDM diagnosed, HCQ started	52-58	Insulin therapy, HCQ 400 mg daily
30	IHCP diagnosed	50-55	UDCA 900 mg daily added
32-35	Serial monitoring	50-58	Multidisciplinary planning
36	Delivery	52	LSCS, immediate transfer
Day 1	Pacemaker implantation	70 (paced)	DDD pacemaker placed
Day 7	Discharge	70 (paced)	Both stable
3 months	Follow-up	70-150 (paced)	Normal development, stable pacing

A dual-chamber permanent pacemaker was successfully implanted within 24 hours of life. Pacemaker parameters were within acceptable limits.

The neonate demonstrated stable hemodynamic post-procedure with good pacing capture. The postoperative course was uneventful, and the infant was discharged in stable condition. At 3-month follow-up, the infant showed appropriate weight gain and normal developmental milestones. Pacemaker function remained satisfactory, and echocardiography revealed normal ventricular function.

DISCUSSION

Congenital complete heart block is most commonly associated with maternal anti-Ro/SSA antibodies, which cause immune-mediated injury to the fetal cardiac conduction system.[2,3] Although antenatal therapies such as corticosteroids and hydroxychloroquine are used, their role in reversing established complete heart block remains limited.[5]

Early neonatal pacing remains the cornerstone of management in infants with congenital complete heart block. Indications for pacemaker implantation include persistent bradycardia, ventricular dysfunction, or risk of hemodynamic compromise.[6] In our case, sustained bradycardia warranted early intervention, and pacemaker implantation within the first 24 hours of life resulted in a favourable outcome. Antenatal diagnosis played a crucial role in enabling planned delivery and timely neonatal intervention.[4] Multidisciplinary coordination between obstetricians, neonatologists, and paediatric cardiologists contributed significantly to the successful outcome.

CONCLUSION

Timely neonatal pacing following antenatal diagnosis of immune-mediated congenital complete heart block can result in favourable outcomes. This case underscores the importance of coordinated perinatal and neonatal care in optimizing survival and short-term prognosis.

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