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## **Single chamber pacemaker immediate implantation in 2 hours afterbirth infant with complete congenital atrioventricular block**

**Short title:** The pacemaker implantation in infant with complete congenital atrioventricular block

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Congenital complete atrioventricular block (CCAVB) is a rare disease that occurs in approximately 1 of every 20 000 pregnancies [1] and it is believed to be caused by transplacental passage of maternal anti-SSA/Ro-SSB/La antibodies [2]. The early diagnosis is crucial as without pacemaker implantation this condition is associated with a high neonatal mortality rate. The risk factors of the unfavorable diagnosis are slow ventricular rate (below 50-60/min), cardiogenic shock and a fetal edema [3–5].

The presented case concerns a premature female infant, in whom the pacemaker implantation was performed within 2 hours afterbirth. The CCAVB was diagnosed at the beginning of the 3<sup>rd</sup> trimester based on fetal echocardiography.

After CCAVB diagnosis watchful waiting strategy was implemented. At the 29<sup>th</sup> week of gestation the fetus presented with heart rate below 60/min. Pharmacological therapy with salbutamol, digoxin and steroid therapy was started. The fetus condition worsened, it started to accumulate fluid in the body cavities. Control echocardiography revealed significantly

enlarged left ventricle with impaired contractility with low ejection fraction (EF) 17% (Figure 1A) and significant bradycardia of 40–50/min. The pregnant female was transported to our Center and the CC was performed. The infant was delivered at 31<sup>st</sup> week of gestational age. The birth weight was 1970 g. Due to cardiopulmonary compromise, the newborn required respiratorotherapy. An electrocardiography (ECG) showed complete atrioventricular block with an atrial rate of 167/min and ventricular rate of 42/min (Fig. 1B). Single bolus of atropine followed by adrenaline, milrinone and dopamine infusions were administered without any improvement. Isoprenaline was not given due to immediate surgical qualification for pacemaker implantation. The transthoracic echocardiography (TTE) revealed a markedly enlarged left ventricle with decreased myocardial contractility (EF, 21%), bradycardia 28–40/min and decreased cardiac output. The implantation of a single chamber pacing system Microny II SR+2525T by Jude Medical with a bipolar epicardial electrode (Figure 1C, D) was performed. On the 12<sup>th</sup> day following pacemaker implantation the left ventricular EF was 40% by biplane Simpson method.

This case is not the first described in the literature, however what stands out this case from others is the fact, that the mother of the patient was on purpose transferred to our Center before delivery, in order to perform procedure pacemaker implantation immediately after the CC, reducing the total length of intervention and risk of interhospital transport. We believe that in children in the gestational age group (31–34 hbd) with previously mentioned risk factors, the decision to deliver the baby and perform immediate implantation of the pacemaker should not be delayed [4].

In 1 month follow up the general condition was good with proper body weight gain. TTE revealed decreased EF (44%) by Simpson method (Figure 1E) requiring spironolactone and digoxin. However, in 2 year follow up, the contractility decreased significantly down to 20% due to progressive dilated cardiomyopathy, requiring cardiac resynchronization therapy (CRT) and pharmacotherapy including ACE1, carvedilol, digoxin and diuretics. Despite effective electrostimulation and CRT the prognosis is poor due to dilated cardiomyopathy and the patient is a candidate for heart transplant.

## Article information

**Conflict of interest:** None declared.

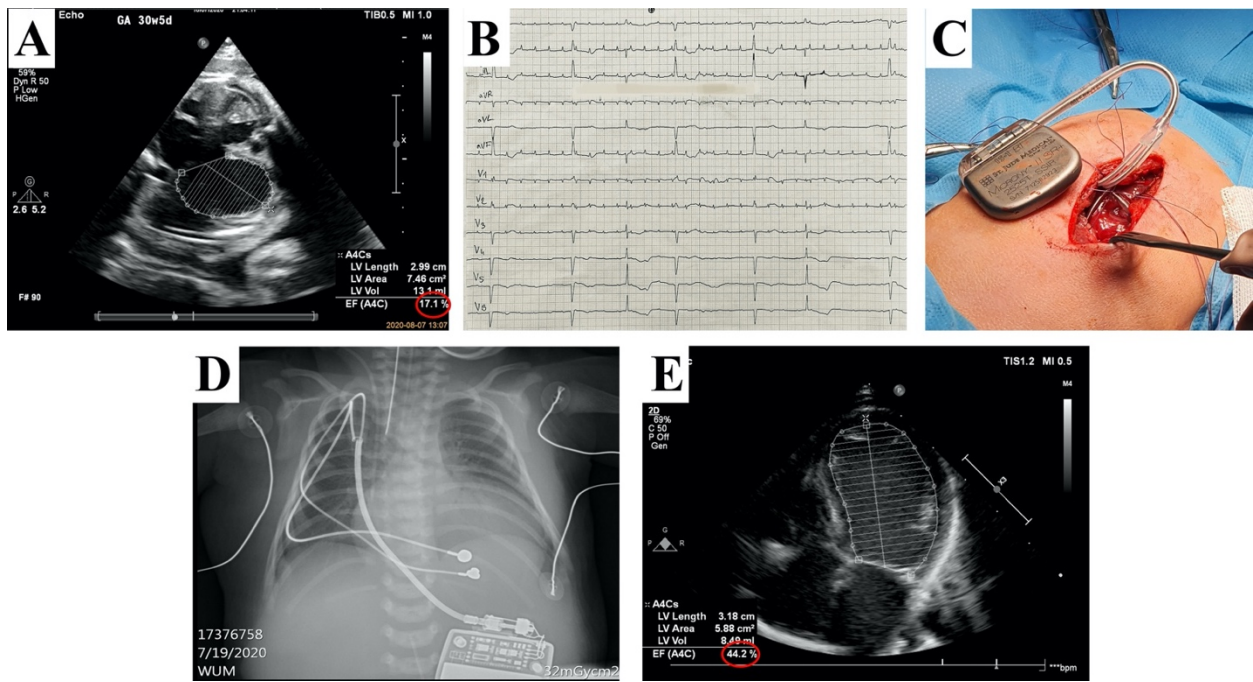
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**Figure 1. A.** TTE with EF before pacemaker implantation **B.** Afterbirth ECG **C.** Intraoperative view of the Microny II SR+ pacemaker **D.** RTG after the implantation **E.** Control TTE before discharged of the patient

Abbreviations: ECG, electrocardiography; EF, ejection fraction; TTE, transthoracic echocardiography