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Brief Report

Late recurrence of infra-Hisian complete atrioventricular block

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Abstract Acquired complete atrioventricular block that is caused by infectious myocarditis is usually transient and has a favourable outcome. We report the case of a 15-year-old girl who had complete infra-Hisian atrioventricular block due to *adeno* viral myocarditis and received a permanent pacemaker at the age of 10 months. The pacemaker lost its function at the age of 7 years. However, she experienced a late recurrence of complete atrioventricular block 10 years later. Complete atrioventricular block is rarely recovered if it persisted for 2 weeks. Even in the patients with late recovery, long-term follow-up and pacemaker therapy are still needed.

Keywords: Cardiac arrhythmia; children; third-degree cardiac block

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Case report

A 15-year-old girl with congenital deafness developed a complete infra-Hisian atrioventricular block with wide QRS escape rhythm (Fig 1a) due to *adenovirus* myocarditis, and received a permanent pacemaker – VVIR mode – because of persistent complete atrioventricular block for 2 weeks at the age of 10 months. She was discharged later and received regular outpatient follow-up every 6 months at cardiology clinic. After 5 years, the pacemaker interrogation recording showed that she had a spontaneous sinus rhythm while awake and pacemaker rhythm during sleep. The electrocardiogram showed a sinus rhythm with bifascicular block of the right bundle branch and a left anterior hemiblock pattern (Fig 1b). However, as she was symptom free, we did not replace the pacemaker when the pacemaker lost its function at the age of 7 years. The patient was lost to follow-up thereafter. After 8 years, at the age 15 years, she suffered from a sudden onset of loss of consciousness with seizure activities – Adams–Stokes seizure – and low heart rate while she was having a meal. The electrocardiogram showed complete infra-Hisian-type atrioventricular block – with an atrial rate of 110 beats per minute and a ventricular rate 39 beats per minute – with a wide QRS escape rhythm of right bundle branch block and superior axis pattern (Fig 2). Her blood pressure was 93/62 millimetres of mercury. The chest X-ray showed cardiomegaly with a cardiothoracic ratio of 58%. The cardiac echocardiogram showed enlargement of all four chambers, with a left ventricular ejection fraction of 60%. Laboratory data showed that there was no evidence of recent infection or elevation of cardiac enzyme, with negative results of blood and virus culture. There were no symptoms of upper respiratory tract infection in the recent months. A permanent pacemaker – DDD mode – was implanted through the transvenous route with a right ventricular pacing wire lead inserted at the high posterior ventricular septum. She was doing well and was discharged home.

Discussion

Viral myocarditis is the most common cause of acquired non-surgical complete atrioventricular block in children. In its acute phase, there are lymphocytes and mononuclear cell infiltration,

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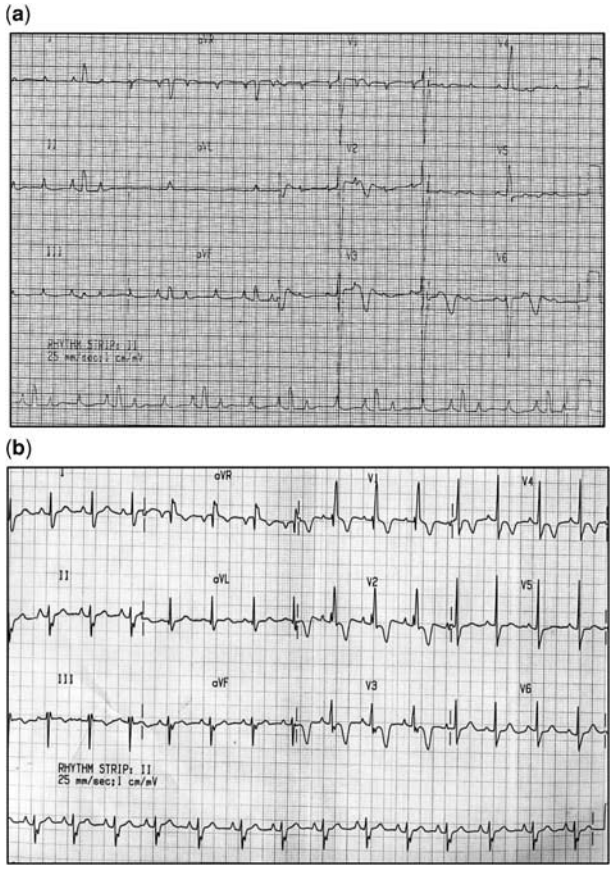

Figure 1.
*(**a**) The electrocardiogram showed complete atrioventricular block with wide QRS escape rhythm, with an atrial rate of 120 beats per minute and a ventricular rate of 38 beats per minute. (**b**) The electrocardiogram showed sinus rhythm with bifascicular block pattern – right bundle branch and left anterior fascicular block.*

inflammation, and cellular necrosis at the conduction system and its neighbourhood. Most of the acquired atrioventricular block after acute myocarditis is expected to recover after the inflammation is resolved.[1–4] Thus, most of such children will have complete recovery. A review of the literature showed that the recovery time of complete atrioventricular block may range from few days to weeks, with the longest of 18 days.[5] Therefore, if complete atrioventricular block persists for 2 weeks, a permanent pacemaker implantation is recommended.[1,3]

Late recovery of complete atrioventricular block is extremely rare. In our patient, her infra-Hisian-type complete atrioventricular block was possibly caused by *adeno* viral myocarditis. After 5 years, her rhythm became sinus with right bundle branch block and

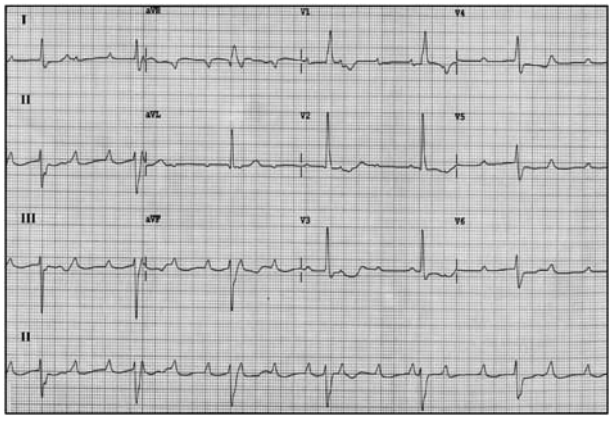

Figure 2.
The electrocardiogram revealed an infra-Hisian-type complete atrioventricular block, with a wide QRS escape rhythm of right bundle branch block and superior axis, with an atrial rate of 110 beats per minute and a ventricular rate of 39 beats per minute.

superior axis, suggesting that her left posterior fascicular conduction was spontaneously recovered. Then, she experienced another episode of complete atrioventricular block 10 years later, which suggested that her left posterior fascicular conduction was again blocked. Therefore, the period of her late recovery of the complete atrioventricular was estimated to be 10 years.

In conclusion, our case report suggested that, even in patients with acquired non-surgical infra-Hisian-type atrioventricular block with a late recovery, long-term follow-up and pacemaker therapy is still needed to detect and treat the potential recurrence of atrioventricular block. To the best of our knowledge, there is no similar case reported before.

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