

Atrioventricular sequential pacemaker implantation in an adult patient with a Fontan circulation

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DOI: 10.33963/KPa2022.0063

Received:

January 24, 2022

Accepted:

March 8, 2022

Early publication date:

March 8, 2022

A 29-year-old female was referred to our hospital with recurrent syncope and heart failure symptoms. She had been born with tricuspid atresia, right ventricular hypoplasia, an atrial septal defect, ventricular septal defect, pulmonary valve stenosis, right retroesophageal subclavian artery, and persistent left superior vena cava. The patient had undergone Blalock-Taussig (BT) shunt in infancy, hemi-Fontan operation at five years of age, and fenestrated Fontan completion one year later. Electrocardiographic (ECG) monitoring showed episodes of sino-atrial dissociation and chronotropic incompetence (Figure 1A). The patient was listed for dual-chamber pacemaker implantation. Pre-procedural planning included a heart catheterization with a detailed hemodynamic and angiographic evaluation (Figure 1B, Supplementary material, Figure S1) and ECG-gated cardiac contrast computed tomography (CT). For a precise evaluation of intracardiac anatomy, we created a computed tomography reconstruction and printed a three-dimensional model of the Fontan circulation, heart chambers, and coronary sinus with its tributaries (Supplementary material, Figure S2). Pacemaker implantation was carried out under light analgesedation in a hybrid operating room. Venous access was

gained by puncture of the left subclavian vein. Fenestration in the Fontan baffle was cannulated with the Medtronic Attain Command™ delivery system (Medtronic, Minneapolis, MN, US), and the leads were advanced into the atrium [1]. A coronary sinus lead Biotronik Sentus OTW BP was positioned in a posterior cardiac vein using a sub-selection catheter Medtronic Attain Select™ II. Finally, the lumenless Medtronic SelectSecure™ 3830 lead was placed in the right atrium via Medtronic C315HIS Delivery Catheter.

The procedure and postoperative period were uneventful. The chest radiograph showed the correct position of both leads (Figure 1C). Pacing parameters were excellent, and appropriate pacemaker function was confirmed on ECG monitoring (Figure 1D). Echocardiography showed no intracardiac thrombi or pericardial effusion. Warfarin was commenced for thromboprophylaxis [2]. This case shows that transvenous pacemaker implantation can successfully and safely accomplish restoring atrioventricular synchrony and chronotropic competence.

Supplementary material

Supplementary material is available at https://journals.viamedica.pl/kardiologia_polska.

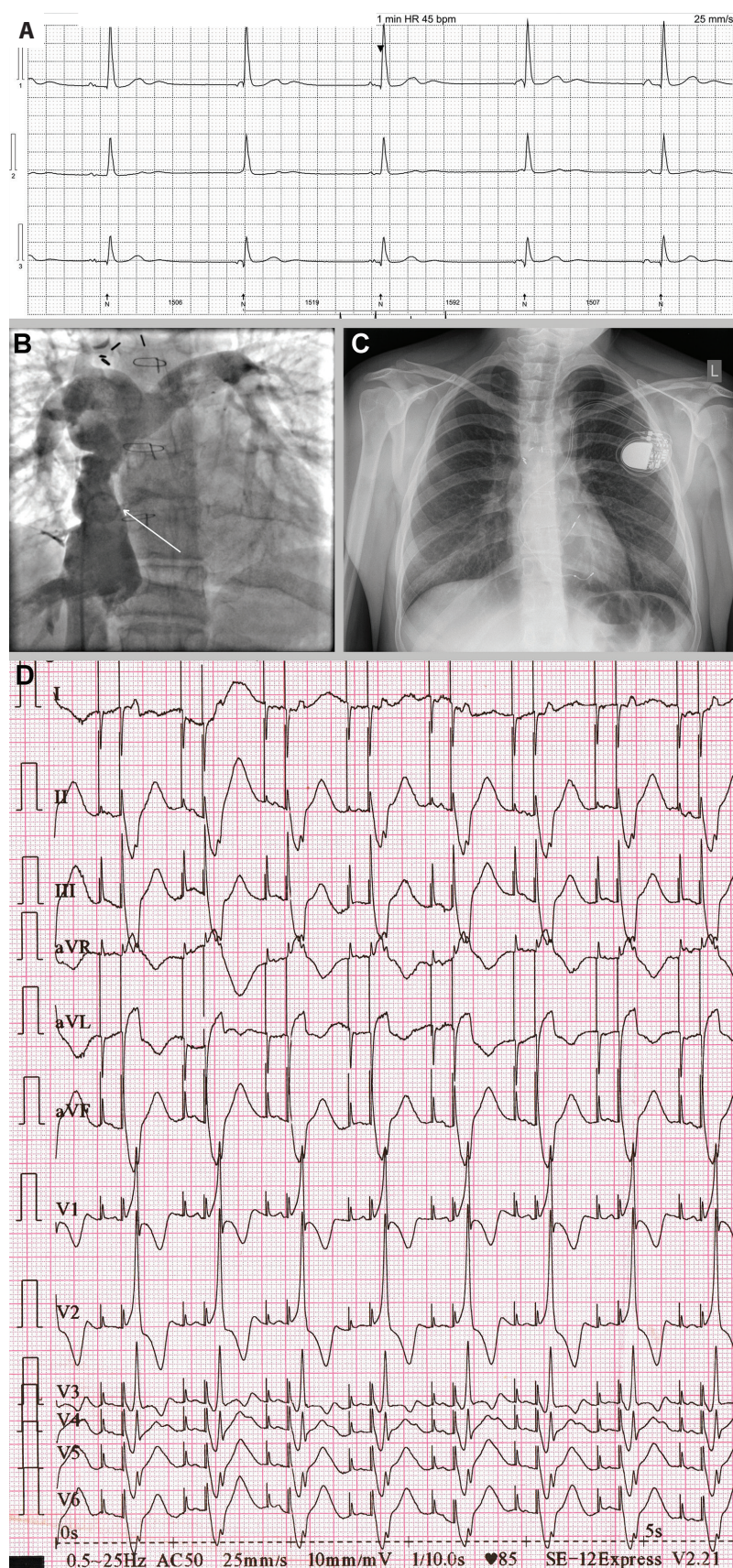


Figure 1. A. Electrocardiographic (ECG) monitoring with episodes of sino-atrial dissociation and chronotropic incompetence. B. Fluoroscopy of a heart catheterization with detailed hemodynamic and angiographic evaluation of the Fontan circulation. The arrow indicates fenestration between the Fontan circulation and the atrium. C. The chest radiograph after the procedure, showing the correct position of both pacing leads. D. ECG registration showing dual-chamber pacing

Article information

Acknowledgments: The authors would like to thank Mateusz Hołda MD, PhD, for preparing a 3D heart model.

Conflict of interest: None declared.

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