

Implantation of a leadless pacemaker in a patient with an atrioventricular block and COVID-19

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Kardiologia Polska. 2021;
79 (11): 1294–1295;
DOI: 10.33963/KPa2021.0111

Received:

July 22, 2021

Revision accepted:

September 16, 2021

Published online:

September 17, 2021

Data on leadless pacemaker (LP) implantation in the unique epidemiological environment is limited. Herein, we report on an 85-year-old male with a SARS-CoV-2 infection confirmed by reverse transcription polymerase chain reaction, symptomatic bradycardia, and permanent atrial fibrillation. He was implanted with a conventional single-chamber pacemaker in June 2019. It was followed by thrombosis of the left subclavian vein and the extraction of the pacemaker system due to the pocket infection with methicillin-sensitive *Staphylococcus aureus* in March 2021. A 24-hour Holter monitoring revealed episodes of third-degree atrioventricular block, with an average heart rate of 45 bpm, 4739 pauses, with the longest one of 4624 ms (Figure 1A). No Morgagni-Adams-Stokes attacks were observed while there was evidence of fatigue and progressive cognitive impairment.

Upon admission, physical examination confirmed no signs of acute heart and respiratory failure or inflammation of the pocket area. An initial electrocardiogram revealed atrial fibrillation with a ventricular rate of around 40 bpm. Computed tomography of the chest showed 10% of the lungs to be inflamed (Figure 1B). On April 28, the implantation of a Micra™ VR Transcatheter Pacing System (Medtronic, Dublin, Ireland) was carried out in the Electrophysiological Laboratory under local anesthesia, through the right femoral vein. It was performed using personal protective equipment (PPE) (Figure 1C). After 105 minutes, two fixation tines were attached to the myocardium (Supplementary material, Video S1; Figure 1D). The initial parameters were satisfactory, with a threshold of

0.24 V/0.24 ms, an R-wave of 9.2 mV, and an impedance of 850 Ohm. The exposition dose was 113.7 mGy, and fluoroscopy time was 14.37 minutes. The mean time (interquartile range [IQR]) of 11 other procedures in our department is 115 (75–180) minutes. A mean fluoroscopy time (IQR) is 24.03 (12.45–40.50) minutes.

No peri- and post-procedural complications were recorded. Clinical improvement enabled a home discharge on the last day of the isolation.

During the pandemic, electrophysiological procedures were performed in our Electrophysiological Laboratory on patients actively infected with SARS-CoV-2, following the recommendations [1]. A Micra implantation is reported to have a lower rate of complications [2], but there is little data available on performing this procedure on patients with an active infection. To date, only one case report exploring the implantation of a leadless pacemaker in a SARS-CoV-2-positive patient has been published. Cakulev et al. [3] emphasized a considerable reduction in periprocedural steps and personnel involved in the process, which is consistent with the recommendations of the Polish Cardiac Society [4].

Potential LP advantages in patients eligible for LP modes, who require urgent pacemaker implantation, seem multifaceted. Firstly, LP related to a significantly lower rate of thrombosis when compared with traditional transvenous pacemakers [2], and SARS-CoV-2 infection is associated with an increased risk of thrombosis [5]. Secondly, a femoral vein implantation approach allows for an increased distance between the oper-

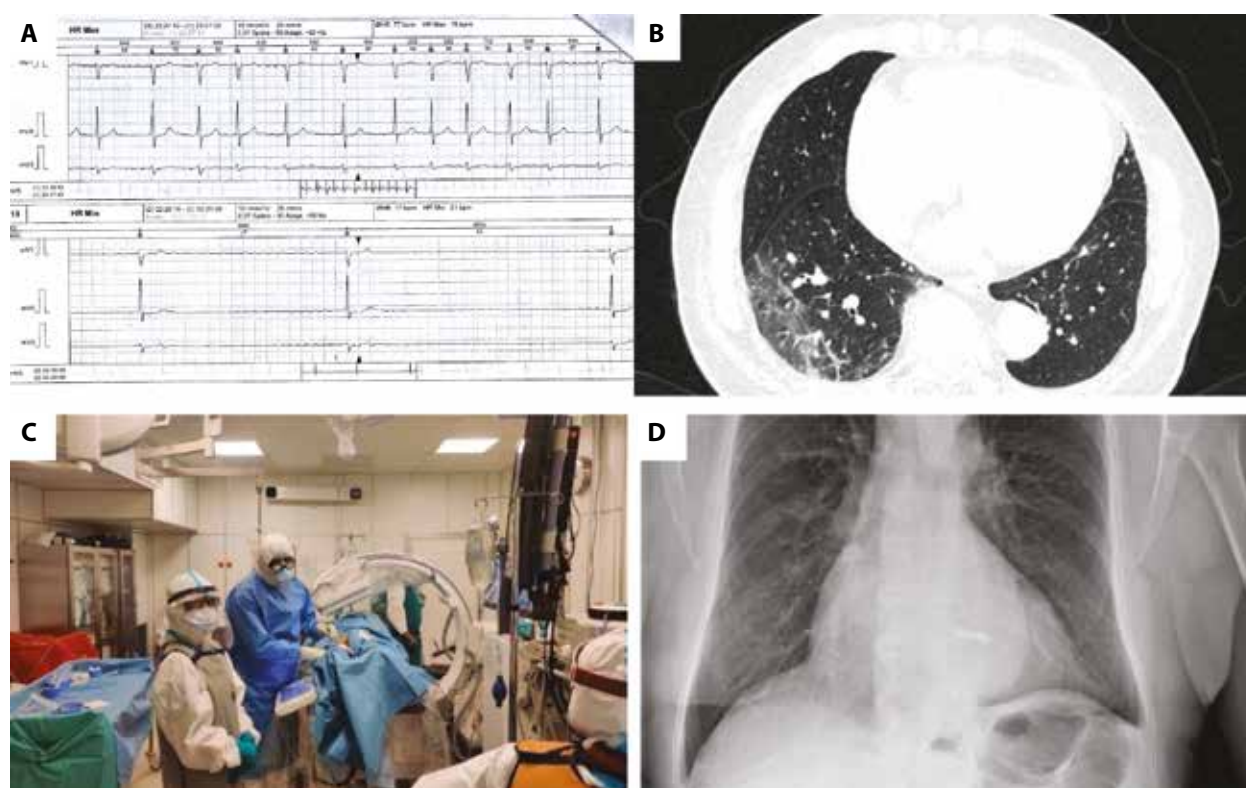


Figure 1. **A.** Electrocardiogram tracing from 24-hour Holter monitoring after transvenous lead extraction with the longest pause of 4624 ms. **B.** Transverse computed tomography scan — a representative image with pneumonia. **C.** Implantation of Micra™ VR in the Electrophysiological Laboratory with personnel wearing PPE. **D.** Chest X-ray in posteroanterior view with implanted Micra™ VR in the right ventricle of the heart

ator and the patient's respiratory tract, reducing contact with contaminated air and limiting skin healing time. Thirdly, our observations suggest that carrying out the implantation while wearing PPE did not noticeably affect the skin-to-skin procedure time.

The LP system implantation is feasible and provides a considerable alternative for patients with urgent pacing indications due to severe atrioventricular conduction disturbances and active SARS-CoV-2 infection.

Supplementary material

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

Article information

Conflict of interests: BS is an employee of Medtronic Poland, DJ received speaker honoraria and consulting fees from Medtronic. BH, BB, KP, and WB declare no conflict of interest.

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How to cite: Hrymniak B, Biel B, Szwarc B, et al. Implantation of a leadless pacemaker in a patient with an atrioventricular block and COVID-19. *Kardiol Pol.* 2021; 79(11): 1294–1295, doi: 10.33963/KP.a2021.0111.

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