©Copyright by Croatian Cardiac Society. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (https://creativecommons.org/licenses/by/4.0/) which permits users to read, download, copy, distribute, print, search, or link to the full texts of these articles in any medium or format and to remix, transform and build upon the material, provided the original work is properly cited and any changes properly indicated.

Cardioneuroablation: A Promising Alternative to Permanent Pacemaker Implantation or a Future Standard of Care? A Case Report

Borna Emić[1]*, Valentina Obadić[2], Maja Gršković[2], Martina Petrinović[2], Ivica Premužić Meštrović[2], Josip Stjepanović[2], Ena Kurtić[2], Matija Marković[2], Tomislav Letilović[2]

[1]General Hospital "Dr Anđelko Višić" Bjelovar, Bjelovar, Croatia
[2]University Hospital "Merkur", Zagreb, Croatia

KEYWORDS: cardioneuroablation, syncope, atrioventricular block, bradycardia.

CITATION: Cardiol Croat. 2026;21(11-12):221-2. | https://doi.org/10.15836/ccar2026.221

***ADDRESS FOR CORRESPONDENCE:** Borna Emić, Opća bolnica "Dr Anđelko Višić" Bjelovar, A. Mihanovića 8, HR-43000 Bjelovar, Croatia. / Phone: +385-99-4343-364 / E-mail: borna.emic@gmail.com

ORCID: Borna Emić, https://orcid.org/0009-0002-0212-7091 • Valentina Obadić, https://orcid.org/0000-0001-9915-5122
Maja Gršković, https://orcid.org/0009-0000-2090-1306 • Martina Petrinović, https://orcid.org/0000-0002-3456-0968
Ivica Premužić Meštrović, https://orcid.org/0000-0002-2592-8302 • Josip Stjepanović, https://orcid.org/0000-0002-3146-9704
Ena Kurtić, https://orcid.org/0000-0001-6673-6510 • Matija Marković, https://orcid.org/0000-0002-2852-3730
Tomislav Letilović, https://orcid.org/0000-0003-1229-7983

Introduction: Cardioneuroablation (CNA) is an emerging catheter-based treatment for selected patients with symptomatic, vagally mediated bradyarrhythmias. By modifying cardiac ganglionated plexi, CNA may offer an alternative to permanent pacemaker implantation in appropriately selected patients.[1,2]

Case report: 50-year-old woman was electively admitted for electrophysiological evaluation of long-standing, sinus bradycardia with predominantly nocturnal atrioventricular (AV) block and, with recent syncope and presyncope accompanied by prodromal symptoms. Severe sinus bradycardia and second-degree 2:1 AV block had been documented. Electrophysiological study demonstrated preserved sinoatrial and infra-Hisian function. Baseline AH interval was 150 ms, HV interval of 58 ms and the Wenckebach point occurred at cycle lengths of 750–800 ms. Following intravenous atropine administration, the AH interval shortened to 86 ms and the Wenckebach point improved to 390 ms, demonstrating a functional, vagally mediated component of AV nodal dysfunction. During the subsequent elective hospitalization, CNA was performed using three-dimensional electroanatomical mapping and intracardiac echocardiography. Radiofrequency applications targeted the right superior, right inferior, and left superior ganglionated plexi, as well as the interatrial septal region (**Figure 1**). Expected physiological responses occurred during ablation, accompanied by progressive PR shortening from 230 to 190 ms and an increase in heart rate from 55/min to 80/min. Immediately after the ablation, an atropine test was done, which showed only a 10% increase in heart rate. Postprocedural electrocar-

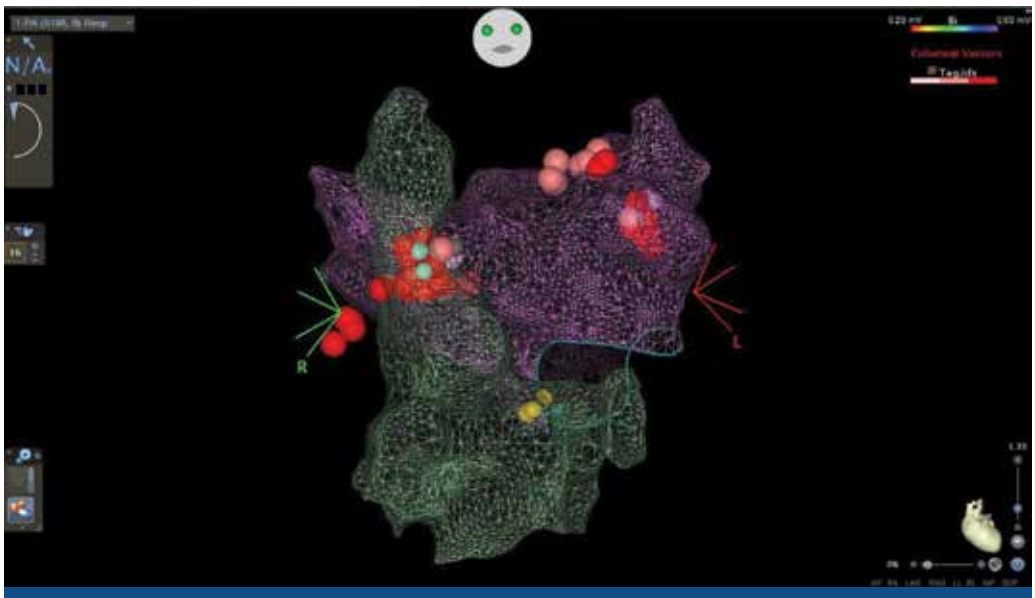


FIGURE 1. Ablated regions of the left and right atria (red dots).

RECEIVED:
October 24, 2026
UPDATED:
November 4, 2026

diography showed sinus rhythm at 72 beats/min, a PR interval of 168 ms, QRS duration of 78 ms, and QTc of 399 ms. Continuous monitoring demonstrated preserved AV conduction without recurrent PR prolongation or higher-degree AV block, including during nocturnal monitoring. At one-month follow-up, the patient remained free of syncope. Holter monitoring demonstrated sinus rhythm, with minimum, mean, and maximum heart rates of 67, 96, and 141 beats/min, respectively. The longest RR interval was 1530 ms, with regular PR intervals without conduction disturbances or relevant extrasystoles.

Conclusion: This case illustrates the potential of CNA as a pacemaker-sparing strategy in selected patients with symptomatic bradyarrhythmias and a functional, vagally mediated component. The favorable short-term clinical and electrocardiographic outcomes are encouraging, particularly when lifelong device implantation might otherwise be considered. Nevertheless, careful patient selection is essential, and further prospective studies with long-term follow-up are required before CNA can be established as a standard alternative to permanent pacing.

LITERATURE

1. Marrese A, Persico R, Parlato E, Faccenda D, Salucci G, Comparone G, et al. Cardioneuroablation: the known and the unknown. Front Cardiovasc Med. 2024;11:1412195. https://doi.org/10.3389/fcvm.2024.1412195
2. Aksu T, Brignole M, Calo L, Debruyne P, Di Biase L, Deharo JC, et al. Cardioneuroablation for the treatment of reflex syncope and functional bradyarrhythmias: a scientific statement of the European Heart Rhythm Association (EHRA) of the ESC, the Heart Rhythm Society (HRS), the Asia Pacific Heart Rhythm Society (APHRS) and the Latin American Heart Rhythm Society (LAHRS). Europace. 2024;26(8):euae206. https://doi.org/10.1093/europace/euae206