©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.

Modified SCORPION technique to mitigate the risk of neo-LVOT obstruction during valve-in-MAC implantation

Josip Ereiz[1]*, Sanda Sokol Tomić[2], Ivan Zeljković[2], Nikša Bušić[2], Ana Jordan[2], Irzal Hadžibegović[2], Daniel Unić[2], Šime Manola[2], Nikola Pavlović[2]

[1]General Hospital "Dr. Josip Benčević", Slavonski Brod, Croatia
[2]Dubrava University Hospital, Zagreb, Croatia

KEYWORDS: mitral annular calcification, transcatheter mitral valve replacement, left ventricular outflow tract obstruction, radiofrequency septal ablation.

CITATION: Cardiol Croat. 2026;21(11-12):273. | https://doi.org/10.15836/ccar2026.273

***ADDRESS FOR CORRESPONDENCE:** Josip Ereiz, Opća bolnica Dr. Josip Benčević, Ul. Andrije Štampara, HR-35000 Slavonski Brod, Croatia. / Phone: +385-99-5344-456 / E-mail: ereiz12345@gmail.com

ORCID: Josip Ereiz, https://orcid.org/0009-0002-2139-016X • Sanda Sokol Tomić, https://orcid.org/0000-0002-4551-9231
Ivan Zeljković, https://orcid.org/0000-0002-4550-4056 • Nikša Bušić, https://orcid.org/0000-0002-7082-4932
Ana Jordan, https://orcid.org/0000-0001-5610-6259 • Irzal Hadžibegović, https://orcid.org/0000-0002-3768-9134
Daniel Unić, https://orcid.org/0000-0003-2740-4067 • Šime Manola, https://orcid.org/0000-0002-9526-3393
Nikola Pavlović, https://orcid.org/0000-0001-9187-7681

Introduction: We report a high-surgical-risk patient with multivalvular heart disease who underwent transcatheter valve-in-mitral annular calcification (MAC) implantation using a modified SCORPION technique to mitigate neo-LVOT obstruction risk.[1-3]

Case report: 80-year-old woman presented with left-sided heart failure and atrial fibrillation with rapid ventricular response. Echocardiography showed left ventricular hypertrophy with preserved ejection fraction, severe mitral stenosis (MVA 0.9 cm² by PHT, mean gradient 13.5 mmHg) with moderate mitral regurgitation, moderate aortic stenosis (AVA 1.1 cm², mean gradient 14 mmHg), moderate tricuspid regurgitation and pulmonary hypertension. Coronary angiography excluded significant coronary artery disease. Surgical treatment would have required mitral valve replacement in extensive MAC, concomitant aortic valve replacement for moderate aortic stenosis, and tricuspid annuloplasty. For this triple-valve procedure, EuroSCORE II was 17.9%. STS predicted operative mortality was 7.6%, and morbidity or mortality 19.7%. Neither score accounts for the technical hazards of surgery in severe MAC. The Heart Team therefore chose a transcatheter approach that addressed the dominant mitral lesion. Moderate aortic stenosis, which alone is not an indication for intervention, was left under surveillance. ECG-gated CT showed a MAC score of 7/8, suggesting low embolization risk with a 29 mm SAPIEN 3 valve. However, predicted neo-LVOT area was 95 mm², below the 200 mm² obstruction threshold. Basal septal hypertrophy prompted pre-emptive septal reduction, while atrial fibrillation with rapid ventricular response warranted a pace-and-ablate strategy, enabling modification of bipolar SCORPION technique to unipolar endocardial ablation without concern for conduction system injury. Unsuccessful coronary sinus lead placement due to venous anatomy necessitated conduction system pacing. Subsequent unipolar radiofrequency ablation of the basal interventricular septum and anterior LVOT segment achieved local electrogram attenuation and loss of capture, followed by AV node ablation. Repeat CT at two months showed a predicted neo-LVOT area of 385 mm². The patient then underwent transseptal valve-in-MAC implantation of a 29 mm SAPIEN 3 Ultra RESILIA valve (+1 mL) performed under general anesthesia with fluoroscopic and TEE guidance. Mild paravalvular leak was observed at the posteromedial commissure (A3/P3), without transvalvular regurgitation. The mean transmitral gradient was 1.6 mmHg, with no detected echocardiographic or invasive LVOT gradient. The patient was discharged on the fifth post-procedural day without complications.

Conclusion: This case shows that endocardial radiofrequency septal ablation can effectively enlarge the neo-LVOT before transcatheter mitral valve replacement in high-surgical-risk patients. It is particularly suitable for patients with pacing or those undergoing pace-and-ablate.

RECEIVED:
October 25, 2026
UPDATED:
November 4, 2026

LITERATURE

1. Hoskins MH, Lisko JC, Greenbaum AB, Ueyama HA, Merchant FM, Lloyd MS, et al. Septal Bipolar Ablation to Prevent Left Ventricular Outflow Tract Obstruction After Transcatheter Mitral Valve Implantation. Circ Cardiovasc Interv. 2023 Oct;16(10):e013333. https://doi.org/10.1161/CIRCINTERVENTIONS.123.013333
2. Killu AM, Guerrero M, Siontis KC, El Sabbagh A, Eleid MF, Alkhouli M, et al. A novel technique-Prophylactic septal radiofrequency ablation to prevent left ventricular outflow tract obstruction with transcatheter mitral valve replacement (RADIO-TMVR). J Cardiovasc Electrophysiol. 2020 Nov;31(11):3048-3055. https://doi.org/10.1111/jce.14720
3. Yoon SH, Bleiziffer S, Latib A, Eschenbach L, Ancona M, Vincent F, et al. Predictors of Left Ventricular Outflow Tract Obstruction After Transcatheter Mitral Valve Replacement. JACC Cardiovasc Interv. 2019 Jan 28;12(2):182-193. https://doi.org/10.1016/j.jcin.2018.12.001