ESOT | Transplant International

TYPE Letter to the Editor
PUBLISHED 12 November 2026
DOI 10.3389/ti.2026.17305

Check for updates

OPEN ACCESS

*CORRESPONDENCE
Ignacio Hernandez-Gonzalez,
hgnacho@hotmail.com

†These authors have contributed equally to this work

RECEIVED 05 July 2026
REVISED 24 October 2026
ACCEPTED 30 October 2026
PUBLISHED 12 November 2026

CITATION
Hernandez-Gonzalez I, Sánchez-Antolín G, Rioja Abad S, Marcos Carrasco N, Asensio Díaz E and Muñoz San José JC (2026) Restoring liver transplant candidacy with transcatheter aortic valve implantation in a patient with cirrhosis and severe aortic stenosis. *Transpl. Int.* 39:17305.
doi: 10.3389/ti.2026.17305

COPYRIGHT
© 2026 Hernandez-Gonzalez, Sánchez-Antolín, Rioja Abad, Marcos Carrasco, Asensio Díaz and Muñoz San José. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

Restoring liver transplant candidacy with transcatheter aortic valve implantation in a patient with cirrhosis and severe aortic stenosis

Ignacio Hernandez-Gonzalez[1*†], Gloria Sánchez-Antolín[2†], Sara Rioja Abad[1], Natalia Marcos Carrasco[2], Enrique Asensio Díaz[3] and Juan Carlos Muñoz San José[1]

[1]Department of Cardiology, Hospital Universitario Río Hortega, Valladolid, Spain, [2]Department of Hepatology and Liver Transplantation, Hospital Universitario Río Hortega, Valladolid, Spain, [3]Department of General and Digestive Surgery, Hospital Universitario Río Hortega, Valladolid, Spain

KEYWORDS
aortic stenosis, bridge therapy, liver cirrhosis, liver transplantation, transcatheter aortic valve implantation

Dear Editors,

The convergence of severe aortic stenosis and end-stage liver disease in orthotopic liver transplantation (OLT) candidates is an increasingly recognized clinical challenge, driven by the shared cardiometabolic risk factor profile underpinning both metabolic dysfunction-associated steatotic liver disease (MASLD) and degenerative valvular disease. Severe aortic stenosis constitutes a contraindication to OLT due to the hemodynamic burden it imposes perioperatively, while advanced cirrhosis frequently precludes conventional surgical aortic valve replacement (SAVR). In patients with advanced cirrhosis, cardiac surgery may carry a prohibitive risk owing to coagulopathy, immune dysfunction, poor nutritional status, renal impairment, and the severity of liver disease and its complications. The 2024 EASL Clinical Practice Guidelines on liver transplantation and the 2025 International Liver Transplantation Society and the Liver Intensive Care Group of Europe guidelines for cardiovascular assessment before liver transplantation explicitly mandate structured preoperative risk stratification, including the treatment of significant structural heart disease, as part of the pre-transplant workup [1, 2]. Transcatheter aortic valve implantation (TAVI) has emerged as the solution to this therapeutic impasse. We report a case in which TAVI was used as a bridge to successfully restore OLT eligibility.

A 63-year-old male with hypertension, dyslipidemia, type 2 diabetes mellitus, former smoking (30 pack-years), and chronic alcohol misuse presented in March 2023 with acute pulmonary oedema (APE) and type 2 myocardial infarction due to acute anemia from large esophageal varices, managed by endoscopic band ligation. He also had a history of ST-elevation myocardial infarction in 2013, treated with percutaneous revascularization of the circumflex artery, and, in accordance with both current and contemporary recommendations, was receiving indefinite aspirin therapy [3]. The workup confirmed mixed-etiology (alcoholic and MASLD-related) cirrhosis with portal hypertension, right portal vein thrombosis, and hepatocellular carcinoma (HCC) within up-to-seven criteria. Coronary angiography confirmed patency of the previously stented artery. Transthoracic echocardiography demonstrated severe aortic stenosis (peak gradient 66 mmHg, mean gradient 43 mmHg, valve area 0.52 cm2/m2) with left ventricular systolic function at the

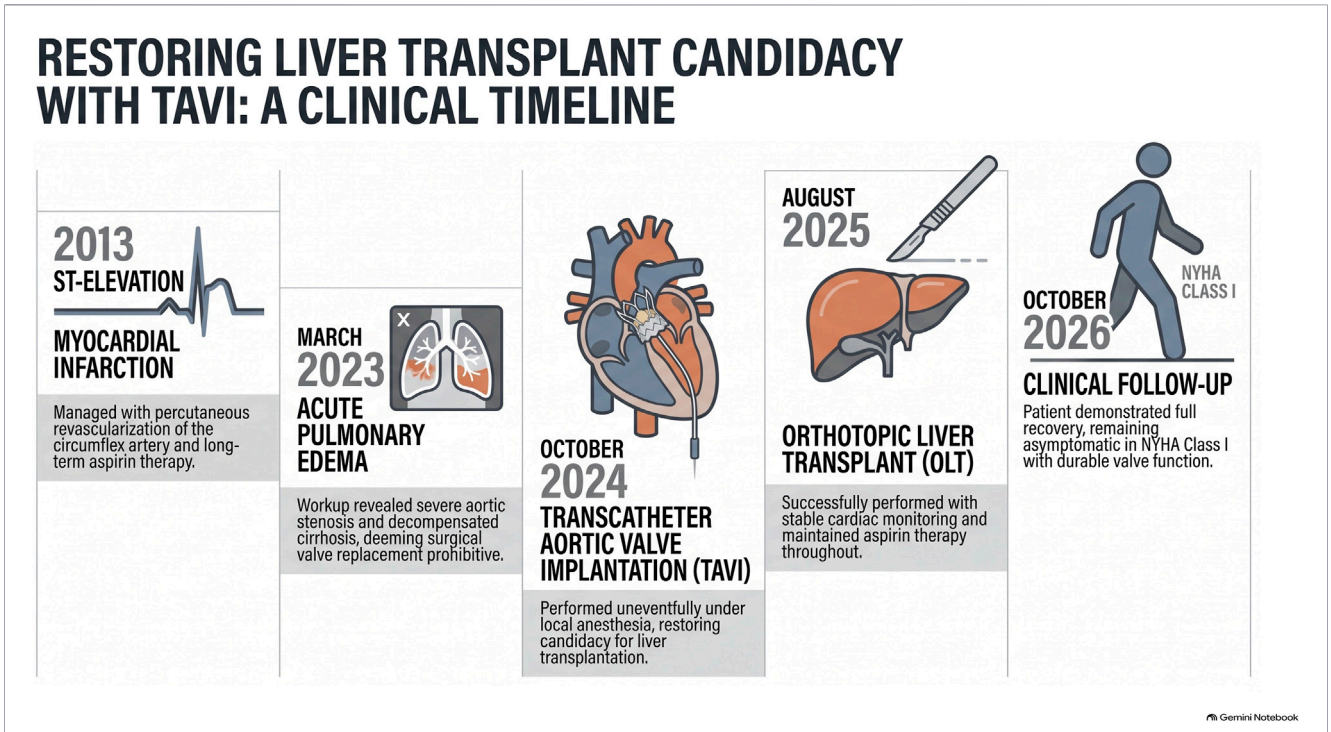


FIGURE 1
Clinical timeline. Timeline of the clinical course from the index cardiac event (2013) to the most recent follow-up (October 2026). NYHA, New York Heart Association.

lower limit of normal (left ventricular ejection fraction [LVEF] by the biplane Simpson's method 55%). Two episodes of grade II hepatic encephalopathy occurred during the same admission. The patient was deemed ineligible for surgical aortic valve replacement owing to prohibitive perioperative morbidity and mortality in the setting of decompensated cirrhosis.

In October 2024, TAVI was performed under local anesthesia with conscious sedation. The procedure was uneventful and hemodynamically well tolerated, with no clinically significant bleeding related to coagulopathy or portal hypertension and no new conduction disturbances. After full recovery, the patient was referred to complete the pretransplant work-up, including repeat computed tomography, which confirmed that the HCC remained within the up-to-seven criteria. Once preserved left ventricular systolic function (LVEF 60%) and normal function of the bioprosthetic aortic valve (mean gradient 9 mmHg) were confirmed, the case was reviewed by the liver transplant committee, and the patient was listed for OLT in April 2025.

In August 2025, OLT was performed uneventfully from a cardiac perspective. Intraoperative monitoring included electrocardiography, invasive arterial pressure, and central venous pressure. Aspirin 100 mg was maintained throughout the perioperative period. Postoperative complications included hepatic artery thrombosis requiring re-exploration, thrombectomy, and splenic artery ligation; and caecal perforation with polymicrobial peritonitis (*Streptococcus sanguinis* and *Bacteroides thetaiotaomicron*), treated surgically. No cardiac complications were documented, and echocardiography at discharge confirmed preserved LVEF and a normally functioning bioprosthetic valve. At 14 months of follow-up, the patient remains asymptomatic in NYHA class I, with no readmissions, and serial echocardiograms confirm durable prosthesis function (Figure 1).

This case illustrates an increasingly prevalent scenario: an OLT candidate with significant structural heart disease in the setting of shared cardiometabolic risk factors. TAVI is a viable treatment option for severe aortic stenosis in patients across different stages of liver disease, with careful and individualized patient selection [4]. Compared with surgical aortic valve replacement (SAVR), TAVI appears to be associated with a shorter length of hospital stay, lower healthcare costs, fewer complications, and lower short-term mortality [5]. However, long-term data on TAVI outcomes in patients with cirrhosis are limited. As a bridge to OLT specifically, Levy et al. reported three patients with cirrhosis who regained transplant eligibility after TAVI [6], and Caughron et al. found that 7 of 29 patients with end-stage liver or renal disease undergoing TAVI were subsequently listed for transplantation [7]. In addition, the safety of major abdominal surgery after TAVI has been documented across all post-procedural time intervals [8]. Careful patient selection, guided by the severity of liver disease and renal impairment, is critical to avoid futile interventions [9]. Regarding the continuation of antithrombotic therapy, American and European guidelines recommend maintaining low-dose aspirin

Abbreviations: APE, acute pulmonary oedema; HCC, hepatocellular carcinoma; MASLD, metabolic dysfunction-associated steatotic liver disease; NYHA, New York Heart Association; OLT, orthotopic liver transplantation; SAVR, surgical aortic valve replacement; TAVI, transcatheter aortic valve implantation.

in patients with prior percutaneous coronary intervention undergoing non-cardiac surgery [8, 10]. This strategy appeared to be acceptable in our experience. These observations suggest that TAVI may be considered a means of restoring OLT candidacy in highly selected patients with cirrhosis, provided that a coordinated multidisciplinary approach is applied. Given the limited evidence, further studies are needed to confirm these findings and define the appropriate candidates.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The study was approved by Comité de Ética de la Investigación con Medicamentos Valladolid. The study was conducted in accordance with the local legislation and institutional requirements. The participant provided his written informed consent to participate in this study. Written informed consent was obtained from the individua for the publication of any potentially identifiable images or data included in this article.

Author contributions

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by IH-G and GS-A. All authors read and approved the final manuscript. All authors contributed to the article and approved the submitted version.

Funding

The author(s) declared that financial support was not received for this work and/or its publication.

Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declared that generative AI was used in the creation of this manuscript. The Central illustration (Figure 1) was created with AI-Assisted technology. Initial design elements were AI-generated based on author specifications, then manually refined to ensure accurate representation of the methodology. The authors verified all content for scientific accuracy.

Any alternative text (alt text) provided alongside figures in this article has been generated by Frontiers with the support of artificial intelligence and reasonable efforts have been made to ensure accuracy, including review by the authors wherever possible. If you identify any issues, please contact us.

References

1. European Association for the Study of the Liver. EASL clinical practice guidelines on liver transplantation. *J Hepatol* (2024) 81(6):1040–86. doi: 10.1016/j.jhep.2024.07.032

2. Weiss E, Crespo G, Anderson A, Biancofiore G, Chadha R, Cywinski JB, et al. International liver transplantation society/liver intensive care group of Europe guidelines for cardiovascular assessment before liver transplantation. *Am J Transpl* (2026) 26:219–36. doi: 10.1016/j.ajt.2025.09.020

3. Byrne RA, Rossello X, Coughlan JJ, Barbato E, Berry C, Chieffo A, et al. 2023 ESC guidelines for the management of acute coronary syndromes. *Eur Heart J* (2023) 44:3720–826. doi: 10.1093/eurheartj/ehad191

4. Tirado-Conte G, Rodés-Cabau J, Rodríguez-Olivares R, Barbanti M, Lhermusier T, Amat-Santos I, et al. Clinical outcomes and prognosis markers of patients with liver disease undergoing transcatheter aortic valve replacement: a propensity score-matched analysis. *Circ Cardiovasc Interv* (2018) 11:e005727. doi: 10.1161/CIRCINTERVENTIONS.117.005727

5. Osorio B, Fox SW, Cooper KM, Chandragiri S, Mohani AF, Devuni D. Aortic stenosis in cirrhosis: pathophysiology and management in the context of liver transplantation. *World J Transpl* (2025) 15:102995. doi: 10.5500/wjt.v15.i4.102995

6. Levy C, Lassailly G, El Amrani M, Vincent F, Delhaye C, Meurice T, et al. Transcatheter aortic valve replacement as bridge therapy restoring eligibility for liver transplantation in cirrhotic patients. *Am J Transpl* (2020) 20(9):2567–70. doi: 10.1111/ajt.15955

7. Caughron H, Parikh D, Allison Z, Deuse T, Mahadevan VS. Outcomes of transcatheter aortic valve replacement in end-stage liver and renal disease. *Catheter Cardiovasc Interv* (2021) 98(1):159–67. doi: 10.1002/ccd.29559

8. Halvorsen S, Mehilli J, Cassese S, Hall TS, Abdelhamid M, Barbato E, et al. ESC guidelines on cardiovascular assessment and management of patients undergoing non-cardiac surgery. *Eur Heart J* (2022) 43:3826–924. doi: 10.1093/eurheartj/ehac270

9. Okuno T, Demirel C, Tomii D, Erdoes G, Heg D, Lanz J, et al. Risk and timing of noncardiac surgery after transcatheter aortic valve implantation. *JAMA Netw Open* (2022) 5(7):e2220689. doi: 10.1001/jamanetworkopen.2022.20689

10. Thompson A, Fleischmann KE, Smilowitz NR, de las Fuentes L, Mukherjee D, Aggarwal NR, et al. 2026 AHA/ACC/ACS/ASNC/HRS/SCA/SCCT/SCMR/SVM guideline for perioperative cardiovascular management for noncardiac surgery: a report of the American college of cardiology/american heart association joint committee on clinical practice guidelines. *Circulation* (2026) 154:e413–e504. doi: 10.1161/CIR.0000000000001472