Serial optical coherence tomography imaging in a patient with rapidly progressive cardiac allograft vasculopathy

Mia Dubravčić Došen*, Marija Doronjga, Hrvoje Jurin, Marijan Pašalić, Dora Fabijanović, Nina Jakuš, Ivo Planinc, Jure Samardžić, Maja Čikeš, Daniel Lovrić, Joško Bulum, Hrvoje Gašparović, Davor Miličić, Boško Skorić

University of Zagreb School of Medicine, University Hospital Centre Zagreb, Zagreb, Croatia

KEYWORDS: cardiac allograft vasculopathy, fulminant, graft failure, optical coherence tomography.

CITATION: Cardiol Croat. 2024;19(11-12):418. | https://doi.org/10.15836/ccar2024.418

***ADDRESS FOR CORRESPONDENCE**: Mia Dubravčić Došen, Klinički bolnički centar Zagreb, Kišpatićeva 12, HR-10000, Croatia. / Phone: +385-98-954-9898 / E-mail: dubravcic.mia@gmail.com

ORCID: Mia Dubravčić Došen, https://orcid.org/0000-0003-0441-4772 • Marija Doronjga, https://orcid.org/0009-0007-9361-6953
Hrvoje Jurin, https://orcid.org/0000-0002-2599-553X • Marijan Pašalić, https://orcid.org/0000-0002-3197-2190
Dora Fabijanović, https://orcid.org/0000-0003-2633-3439 • Nina Jakuš, https://orcid.org/0000-0001-7304-1127
Ivo Planinc, https://orcid.org/0000-0003-0561-6704 • Jure Samardžić, https://orcid.org/0000-0002-9346-6402
Maja Čikeš, https://orcid.org/0000-0002-4772-5549 • Daniel Lovrić, https://orcid.org/0000-0002-5052-6559
Joško Bulum, https://orcid.org/0000-0002-1482-6503 • Hrvoje Gašparović, https://orcid.org/0000-0002-2492-3702
Davor Miličić, https://orcid.org/0000-0001-9101-1570 • Boško Skorić, https://orcid.org/0000-0001-5979-2346

Introduction: Rapidly progressive, or fulminant cardiac allograft vasculopathy (CAV) is associated with a high risk of graft failure and mortality in heart transplant (HTx) patients.[1] Since clinical presentation is often dramatic, patients do not typically undergo intravascular imaging, especially not serial assessments of progressively evolving coronary changes.

Case report: We present a case of a 59-year-old HTx recipient who presented in April 2021 with severe dyspnea, three years following HTx. Echocardiography revealed left ventricular (LV) wall thickening (IVSd 13 mm) with a severely reduced ejection fraction (LVEF) of 30%, restrictive filling pattern, and high values of NT-proBNP (>35000 ng/L). Urgent endomyocardial biopsy and coronary angiography were performed. Angiography showed severe CAV, and optical coherence tomography (OCT) of the left anterior descending artery (LAD) showed multiple coronary lesions, including wall edema with side-branch compromise, intimal hyperplasia, erosions, fissure, and spasm (**Figure 1**). Immunohistopathological analysis showed no signs of cellular or antibody-mediated rejection (AMR), however Luminex® revealed a very high mean fluorescence intensity for class II donor-specific anti-HLA antibodies, supporting the clinical suspicion of AMR and related accelerated CAV. Anti-rejection treatment was immediately initiated, along with dual antiplatelet therapy, low-molecular weight heparin, and substitution of cyclosporine with tacrolimus. Anti-rejection therapy, consisting of intravenous immunoglobulins, pulse corticosteroids, and plasmapheresis resulted in significant clinical improvement, improvement in LV function (LVEF 45%), and decrease in NT-proBNP values (16249 ng/L at discharge). Follow-up coronary angiography with OCT showed evolution of coronary lesions including bright spots, necrotic intimal lesions with spasm, and layered fibrotic plaques **(Figure 1)**.

Conclusion: Serial intravascular imaging using OCT in patients with rapidly progressive CAV can provide in vivo insight into the evolution of coronary changes, which may help us better understand the pathogenesis of this form of CAV.

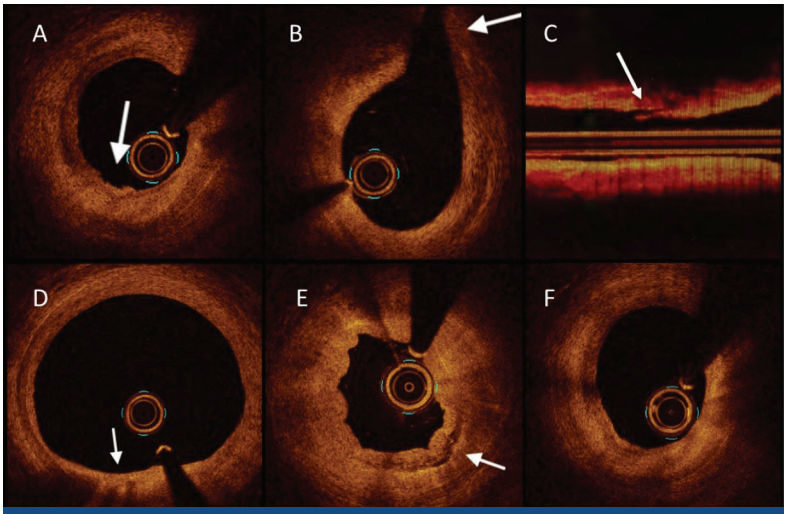

FIGURE 1. Coronary artery lesions detected by serial optical coherence tomography (OCT) imaging. *Row 1* – the initial OCT imaging: A, intimal erosion; B, wall edema with side-branch compromise; C, intimal fissure (longitudinal view). *Row 2* – the follow-up OCT imaging 6 months later: D, bright spots; E, vessel spasm with necrotic lesion; F, layered fibrotic plaque.

RECEIVED:
October 12, 2024

ACCEPTED:
October 31, 2024

LITERATURE

1. Coutance G, Ouldamar S, Rouvier P, Saheb S, Suberbielle C, Bréchot N, et al. Late antibody-mediated rejection after heart transplantation: Mortality, graft function, and fulminant cardiac allograft vasculopathy. J Heart Lung Transplant. 2015 Aug;34(8):1050-7. https://doi.org/10.1016/j.healun.2015.03.002