

# Multidisciplinary approach to treat ruptured abdominal aortic aneurysm into the vena cava

Aigars Lacis, MD, PhD,<sup>a,b</sup> Janis Savlovskis, MD, PhD,<sup>c,d</sup> Kaspars Kisis, MD,<sup>a</sup>  
Edgars Zellans, MD, PhD,<sup>e</sup> Christopher K. Zarins, MD,<sup>f</sup> and  
Dainis Krievins, MD, PhD,<sup>a,d</sup> Riga, Latvia; and Stanford, Calif

A 63-year-old man with a ruptured abdominal aortic aneurysm (AAA) into the inferior vena cava (IVC) underwent aortobifemoral bypass and closure of the aortocaval fistula (ACF). An additional bypass graft from the right iliac limb to the right internal iliac artery was placed to avoid colonic and pelvic ischemia.

Preoperative computed tomography angiography (CTA) revealed an 8.6 cm AAA with rupture into the IVC through an 8.5 mm ACF (A). In addition, there was a 5.8 cm right common iliac and a 5.3 cm left common iliac artery aneurysm (B). The patient became hemodynamically unstable during CTA, and suffered a cardiac arrest with prompt cardiac resuscitation, intubation, and immediate transfer to the operating room.

Ten hours after successful surgery the patient was awake and stable. He had no cardiac history, no symptoms suggestive of coronary artery disease (CAD) and had no electrocardiographic changes. However, the troponin level increased to 217,479.7 ng/L and the creatine kinase MB level increased to 504.6 ng/mL. Coronary angiography revealed left main coronary stenosis and subocclusion of the right coronary artery (C). Percutaneous coronary revascularization was performed with implantation of drug-eluting stents in the left main and right coronary artery.

The patient recovered uneventfully. The 6-month follow-up CTA demonstrated patent aortobifemoral and right internal iliac bypass grafts and the IVC without signs of stenosis (D).

Written informed consent was obtained from the patient for his anonymized information to be published in this article.

AAA rupture into the IVC is rare and is associated with high mortality.<sup>1-4</sup> Preoperative diagnosis of ACF with CTA facilitated expeditious surgical treatment in this patient. Patients who survive surgery but have biomarker evidence of myocardial injury have reduced long-term survival.<sup>2</sup> Patients with AAA commonly have coexistent CAD. Pre-operative diagnosis of silent coronary ischemia with coronary CTA and fractional flow reserve derived from CT (FFRCT) can identify high risk patients who may benefit from coronary revascularisation.<sup>3</sup> Ruptured AAA into IVC with unsuspected CAD can be successfully treated with prompt image-based diagnosis and involvement of a multidisciplinary vascular team.<sup>4</sup>

## REFERENCES

1. Davidovic L, Dragas M, Cvetkovic S, Kostic D, Cinara I, Banzic I. Twenty years of experience in the treatment of spontaneous aorto-venous fistulas in a developing country. *World J Surg* 2011;35: 1829-34.

From the Department of Vascular Surgery,<sup>a</sup> Department of Radiology,<sup>c</sup> and Department of Anesthesiology and Intensive Care,<sup>e</sup> Pauls Stradins Clinical University Hospital, the Riga Stradins University,<sup>b</sup> and the University of Latvia,<sup>d</sup> Riga; and the Department of Surgery, Stanford University Medical Center, Stanford.<sup>f</sup>

Author conflict of interest: none.

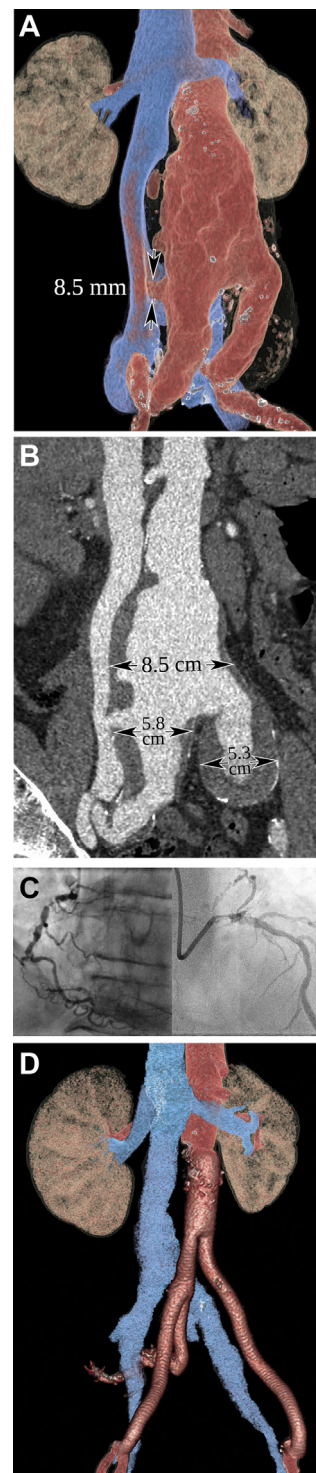
E-mail: aigars.lacis@yahoo.com.

The editors and reviewers of this article have no relevant financial relationships to disclose per the Journal policy that requires reviewers to decline review of any manuscript for which they may have a conflict of interest.

*J Vasc Surg Cases and Innovative Techniques* 2020;6:588-9  
2468-4287

© 2020 The Author(s). Published by Elsevier Inc. on behalf of Society for Vascular Surgery. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

<https://doi.org/10.1016/j.jvscit.2020.07.013>



2. Simons J, Baril D, Goodney P, Bertges D, Robinson W, Cronewett J, et al. The effect of postoperative myocardial ischemia on long-term survival after vascular surgery. *J Vasc Surg* 2013;58:1600-8.
3. Krievins D, Zellans E, Erglis A, Zvaigzne L, Lacis A, Jegere S, et al. High prevalence of asymptomatic ischemia-producing coronary stenosis in patients with critical limb ischemia: anatomic and functional assessment with coronary CT-derived fractional flow reserve (FFRCT). *Vasc Dis Manag* 2018;15:E96-101.
4. Aboyans V, Ricco JB, Bartelink MEL, Björck M, Brodmann M, Cohnert T, et al. 2017 ESC guidelines on the diagnosis and treatment of peripheral arterial diseases, in collaboration with the European Society for Vascular Surgery (ESVS). *Eur Heart J* 2018;39:763-816.

Submitted May 6, 2020; accepted Jul 17, 2020.