Left ventricular-assist device arrest: total thrombosis of a continuous flow left ventricular-assist device

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A 46-year-old man with a continuous flow left ventricular-assist device implanted as destination therapy 2 years ago (CF-LVAD; HeartMate II, Thoratec Corporation, Pleasanton, CA, USA) presented with syncope, low flow device alarms, and several brief device stoppage events. The patient had been off anticoagulation (warfarin, International Normalized Ratio goal of 2.0–2.5) and anti-platelet agent (aspirin, 81 mg daily) for 5 months due to a large subarachnoid haemorrhage necessitating ventriculoperitoneal shunt and several episodes of life-threatening gastrointestinal bleeds. The clinical symptoms and device alarms did not resolve with high-intensity heparin therapy for 1 week requiring the patient to undergo CF-LVAD exchange in toto. The outflow graft of the assist device, imaged in longitudinal view by transthoracic echocardiography near the anastomosis with the aorta shows complete absence of flow by colour Doppler interrogation prior to device exchange (Panel A, arrow and Supplementary data online, Video S1). A short segment of the graft fills retrograde-ly with echocardiographic contrast from the aorta (Panel B, thin arrows). The contrast stops with a smooth concave appearance, delineating a large filling defect in the outflow graft (Panel B, arrowhead and Supplementary data online, Video S2). Pulsed-wave Doppler interrogation of the outflow graft shows unrecognizable flow waveforms (Panel C) and minimal flow velocity in the inflow conduit (Panel D). These findings are consistent with simultaneous thrombosis of the outflow graft and the inflow conduit. Following CF-LVAD exchange, laminar colour flow (Panel E, arrow and Supplementary data online, Video S3), and antegrade filling of the outflow graft with echocardiographic contrast can be seen (Panel F, thin arrows and Supplementary data online, Video S4). The pulsed-wave Doppler velocity profile in the outflow graft (Panel G) and the inflow conduit (Panel H) is normal. The surgical specimen shows complete thrombosis of the outflow graft (Panel I) and the inflow conduit (Panel J) and closely matches the echocardiographic findings.

Supplementary data are available at European Heart Journal – Cardiovascular Imaging online.