CLINICAL VIGNETTE

Successful removal of a perforating ventricular lead after idarucizumab administration

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Patients on direct oral anticoagulants requiring urgent interventions pose a challenge for clinicians.

An 89-year-old man was admitted due to syncopal episodes and dyspnea at rest occuring for a few days. The single chamber pacemaker was implanted 1 month before in another hospital due to symptomatic atrial fibrillation with complete atrioventricular block (FIGURE 1A). No perioperative complications were reported.

Transthoracic echocardiography revealed a perforation in the right ventricle apex with the pacing lead and fluid accumulation in the pericardium (separation of >10 mm) with additional echoes between (FIGURE 1B). Pacemaker interrogation demonstrated high ventricular pacing threshold (>5.5 V) and decreased QRS amplitude (3.0 mV), with normal impedance (680 Ω). The patient was on dabigatran 110 mg orally twice a day, with the last intake 6 hours before admission. He had high thromboembolic risk and high bleeding risk (CHA_2DS_2-VASc score, 6 points; HAS-BLED score, 4 points) with previous bleedings. His baseline dabigatran concentration was high, 367 ng/ml (normal range, 30–200 ng/ml). Laboratory tests also demonstrated prolonged thrombin time of 196 s (normal range, 18–22 s), prolonged activated partial thromboplastin time of 66.4 s (normal range, 27–34 s), prolonged prothrombin time of 15.6 s (normal range, 9.7–11.8 s), increased serum creatinine concentration of 276 µmol/l (normal range, 53–115 µmol/l), and significantly decreased estimated glomerular filtration rate (eGFR) of 15 ml/min/1.73 m^2 (normal range >90 ml/min/1.73 m^2).

A decision was made to neutralize dabigatran activity and to perform urgent transvenous lead explantation with cardiosurgical backup support. The patient received rapid idarucizumab intravenous infusion (2 vials of 2.5 g/50 ml each) without adverse events. Lab tests repeated immediately after showed dabigatran concentrations below a detection limit and coagulation parameters within the normal range (thrombin time, 21 s; activated partial thromboplastin time, 32.4 s; prothrombin time, 11.8 s).

Thirty minutes after idarucizumab administration, the perforating electrode was successfully explanted by direct traction technique and the new one was inserted and connected with the pacemaker. The procedure was carried out without any complications (FIGURE 1C).

Follow-up transthoracic echocardiography did not reveal any increase in pericardial fluid or thrombi (FIGURE 1D). Device interrogation demonstrated stable pacing and sensing thresholds in the right ventricle. On 6-week and 1-year follow-up, the patient was free of symptoms.

Dabigatran is a direct, reversible inhibitor of both free and clot-bound thrombin. The time needed for reversal of dabigatran anticoagulation effect to perform invasive procedures should be based on patients characteristics including age, weight, renal function, time from the last dose intake, interactions with concomitantly administered drugs, and the risk of bleeding associated with the procedure.[1,2] However, for emergent interventions or life-threatening bleeding, immediate neutralization of anticoagulation is indispensable. Idarucizumab, a monoclonal antibody fragment, is the first available targeted reversal agent specific for dabigatran that binds it with a high affinity.[3] Nevertheless, experience with idarucizumab in patients with severe kidney failure (eGFR <30 ml/min/1.73 m^2) is limited. The idarucizumab half-time is prolonged in

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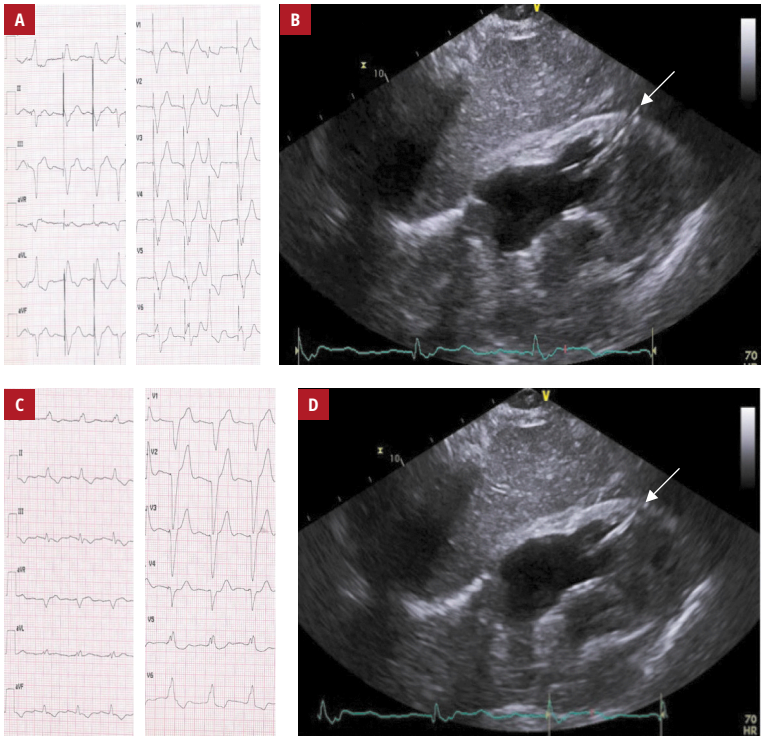

FIGURE 1 **A** – electrocardiogram at admission; **B** – echocardiogram showing the tip of the right ventricular pacemaker lead penetrating the right ventricular wall at the apex (arrow); **C** – electrocardiogram after procedure; **D** – echocardiogram showing successful new lead placement in the right ventricle (arrow)

patients with renal failure; however, greater idarucizumab exposure seems to be favorable, because these patients have also elevated plasma dabigatran concentrations.[4,5] In the presented case, idarucizumab allowed to successfully neutralize dabigatran activity and enable transvenous lead explantation without excess bleeding despite coexistent severe kidney failure.

ARTICLE INFORMATION

CONFLICT OF INTEREST None declared.

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REFERENCES

1 Crowther M, Cuker A. How can we reverse bleeding in patients on direct oral anticoagulants? Kardiol Pol. 2019; 77: 3-11.

2 Pollack CV Jr, Reilly PA, Eikelboom J, et al. Idarucizumab for dabigatran reversal. N Engl J Med. 2015; 373: 511-520.

3 Schiele F, van Ryn J, Canada K, et al. A specific antidote for dabigatran: functional and structural characterization. Blood. 2013; 121: 3554-3562.

4 Eikelboom JW, van Ryn J, Reilly P, et al. Dabigatran reversal with idarucizumab in patients with renal impairment. J Am Coll Cardiol. 2019; 74:1760-1768.

5 Glund S, Stangier J, Schmohl M, et al. Safety, tolerability, and efficacy of idarucizumab for the reversal of the anticoagulant effect of dabigatran in healthy male volunteers: a randomised, placebo-controlled, double-blind phase 1 trial. Lancet. 2015; 386: 680-690.