

Successful Resolution of a Large Left Ventricular Thrombus with Rivaroxaban



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INTRODUCTION

Left ventricular (LV) thrombus is a complication commonly seen in systolic dysfunction, particularly after acute myocardial infarction (AMI). The main risk associated with LV thrombi is systemic embolization, namely stroke, which predominantly occurs within 1 year after AMI.¹ Current guidelines recommend the use of vitamin K antagonists in patients with LV thrombus. At present, no robust data on the use of direct oral anticoagulants (DOACs) for the treatment of LV thrombi are available. We report a case of rivaroxaban-induced resolution of a large LV thrombus in a patient presenting with ST-segment elevation myocardial infarction (STEMI).

CASE PRESENTATION

A 61-year-old man with a history of dyslipidemia and hypertension presented to the emergency department 8 hours after an episode of intense chest pain. On arrival, his blood pressure was 140/95 mm Hg, heart rate 80 beats/min, and oxygen saturation 98%. Physical examination was remarkable only for inspiratory crackles on lung auscultation. Electrocardiography revealed a 3- to 4-mm ST-segment elevation from leads V₁ to V₄ with Q-wave formation and reciprocal ST-segment depression in the inferior leads. Primary angioplasty of an occluded left anterior descending coronary artery was performed with success. A subsequent transthoracic echocardiography demonstrated an LV ejection function of 34% with an apical aneurysm and akinesis of the contiguous myocardial segments. An apical thrombus adherent to the LV wall was seen, measuring 22 × 28 mm (Figures 1 and 2, Video 1). In addition to dual-antiplatelet therapy (aspirin 100 mg/day, clopidogrel 75 mg/day), the patient started oral anticoagulation (rivaroxaban 20 mg/day after meals). Hospital recovery was uneventful. The patient was discharged with guideline-directed management of coronary artery disease and heart failure as well as dual-antithrombotic therapy with clopidogrel 75 mg/day and rivaroxaban 20 mg/day after meals. At subsequent outpatient follow-up 1 month later, repeat transthoracic echocardiography showed no visible thrombus (Figure 3), with no improvement in LV ejection fraction and wall motion abnormalities (Video 2). No evidence of

VIDEO HIGHLIGHTS

Video 1: Transthoracic echocardiography, apical four- and two-chamber views with three-dimensional reconstruction: apical mural thrombus.

Video 2: Transthoracic echocardiography, apical four-chamber view after 30 days on rivaroxaban therapy: no thrombus on apex.

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clinical thromboembolic events was noted between initial and follow-up appointments.

DISCUSSION

In this case report we present the complete resolution of a large LV thrombus 30 days after STEMI. Proper management of these thrombi is still controversial because there are limited data, especially on established left-sided intracardiac thrombi.

Contemporary data suggest that the incidence of LV thrombus may be as high as 15% in patients with STEMI and up to 25% in patients with anterior AMI. Those at high risk for apical LV thrombus are those with large or anterior AMI or severe apical hypokinesia and those receiving delayed reperfusion. Higher embolic potential is associated with protruding configuration and patterns of mobility of the LV thrombi.² However, time-course variation in shape and mobility are not uncommon,³ and therefore the embolic risk is somewhat unpredictable.

Current European Society of Cardiology guidelines recommend the use of anticoagulation for up to 6 months, guided by repeated imaging (class IIa, level of evidence C).⁴ In ROCKET-AF trial, rivaroxaban was noninferior to warfarin in preventing stroke or systemic embolism in nonvalvular atrial fibrillation. Among patients excluded were those with LV thrombus.⁵ Recent prospective and retrospective data have shown that two thirds of left atrial and left atrial appendage thrombi resolve or are reduced in size after 6 weeks of rivaroxaban treatment. This was the first prospective study to show that DOACs, particularly rivaroxaban, may be a potential treatment option for left atrial and left atrial appendage thrombi.⁶ In an updated systematic review, most patients with LV thrombi were treated with rivaroxaban, with a rate of resolution of 81% within a median time of 40 days.⁷

The optimal duration of anticoagulation therapy for LV thrombi is not clearly known. Some authors report that if after 3 months of

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Keywords: Left ventricular thrombus, Acute myocardial infarction, Direct oral anticoagulants, Vitamin K antagonists, Warfarin, Rivaroxaban, Antiplatelet therapy

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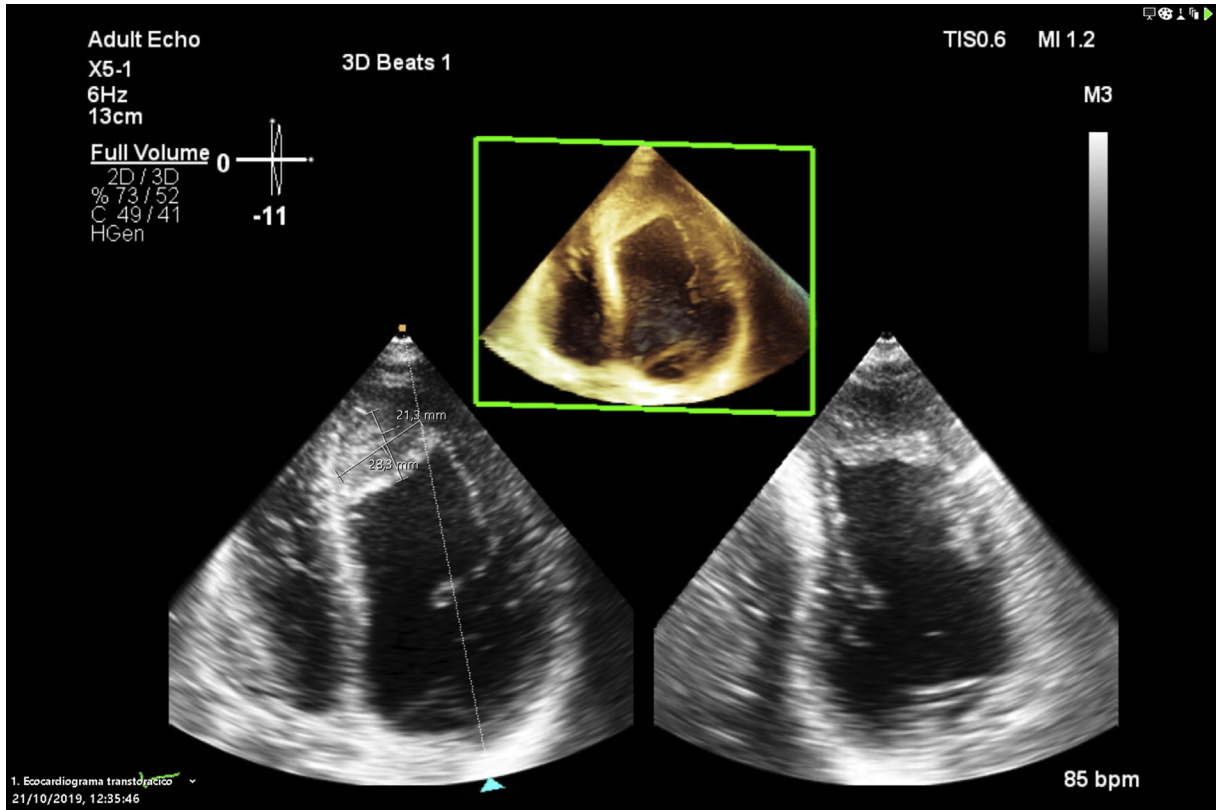


Figure 1 Transthoracic echocardiography, apical four- and two-chamber views with three-dimensional reconstruction: apical mural thrombus.

therapy there is complete resolution of the thrombi, discontinuation of the DOAC earlier than 6 months can be considered, especially if there is recovery of apical wall motion.⁸

We acknowledge that the use of DOACs is not approved for the treatment of LV thrombi. A DOAC was chosen because of

patient preference. There are two randomized controlled trials comparing a DOAC with a vitamin K antagonist in the resolution of LV thrombus after STEMI now recruiting patients ([ClinicalTrials.gov](https://clinicaltrials.gov) identifiers NCT03232398 and NCT02982590).^{9,10} We hope to have data on efficacy and safety

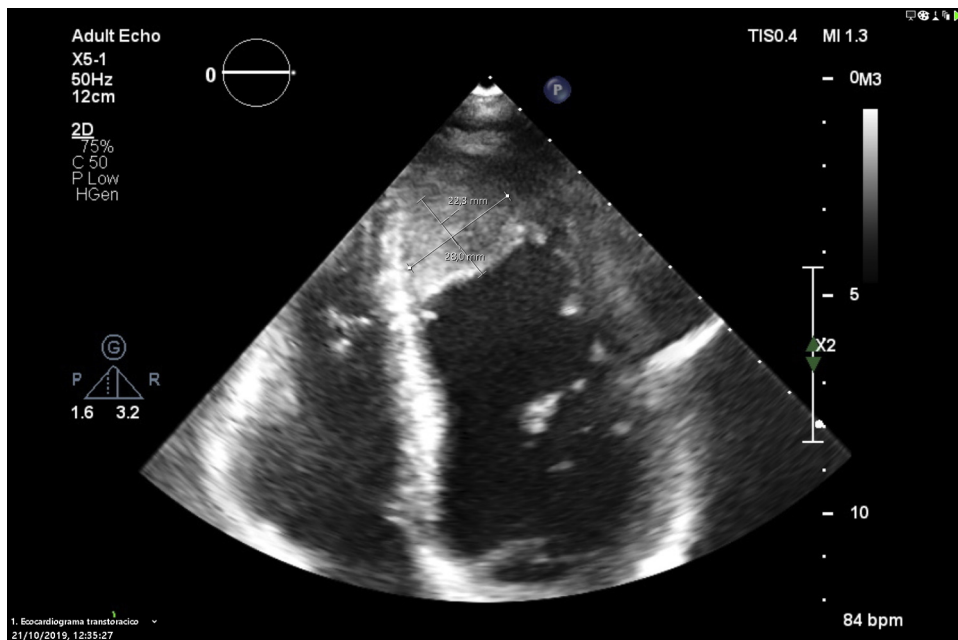


Figure 2 Transthoracic echocardiography, apical four-chamber view, zoomed: apical mural thrombus measuring 22 × 28 mm.

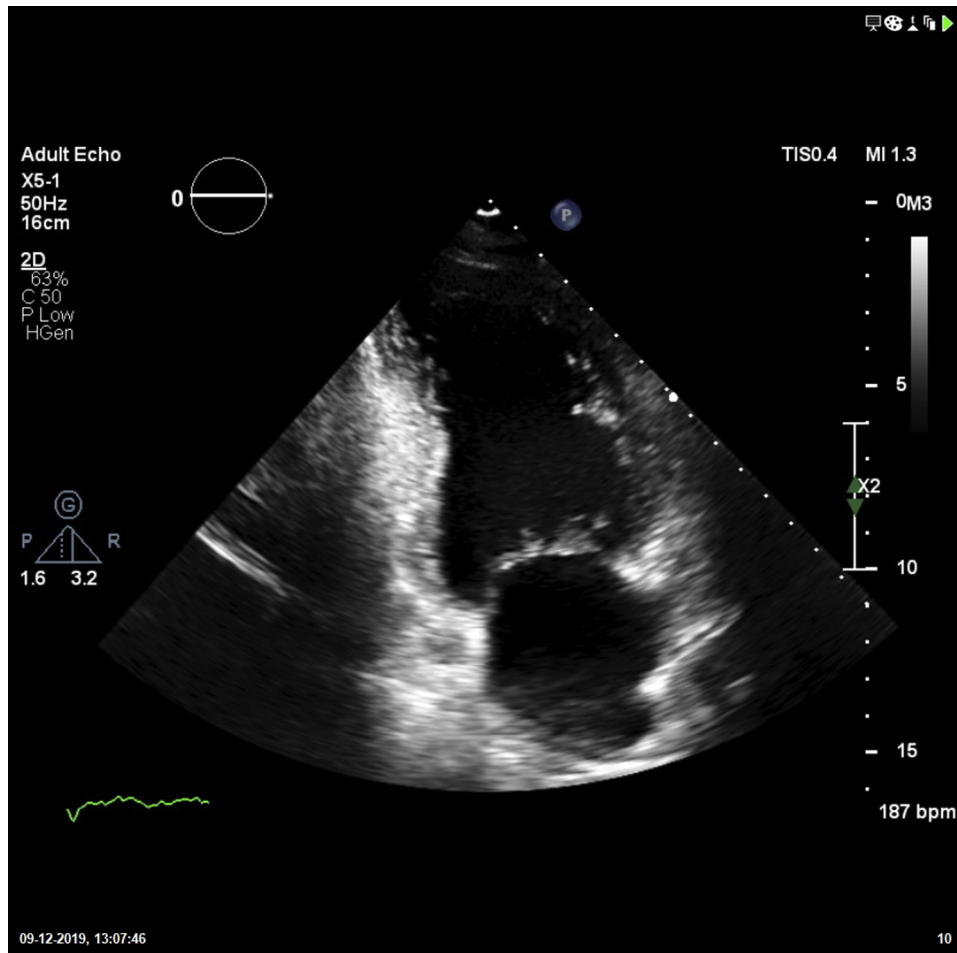


Figure 3 Transthoracic echocardiography, apical two-chamber view after 30 days on rivaroxaban therapy: no thrombus on apex.

and on optimal dosing and timing when or if combined with dual- or single-antiplatelet therapy.

CONCLUSION

This case demonstrates a rapid and successful resolution of a large LV thrombus on DOAC therapy, specifically rivaroxaban. If enough clinical data support the relative efficacy and safety of DOACs in thrombus resolution, they might be more attractive than warfarin in the management of LV thrombi in systolic dysfunction. This may improve patient compliance and reduce length of stay.

SUPPLEMENTARY DATA

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.case.2020.04.006>.

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