

Antithrombin III deficiency concomitant with atrial fibrillation causes thrombi in all chambers: 2D and 3D echocardiographic evaluation

Antithrombin III is an inhibitor of procoagulation cascade using intrinsic and common pathways, the deficiency of which presents with venous thromboembolisms. A 62-year-old man who had anterior myocardial infarction 6 months ago was admitted to our outpatient clinic. Intracardiac defibrillator (ICD) was also implanted after myocardial infarction for primary protection. He was prescribed with dual antiplatelets on discharge after percutaneous coronary intervention to left anterior descending artery. Transthoracic echocardiography (TTE) revealed decreased ejection fraction (25%), apical thrombus in the left ventricle, giant biatrial thrombi, and thickened ICD lead in the right chambers (Fig. 1a–d; Video 1). 2D and 3D transesophageal echocardiography (TEE) demonstrated a giant left atrial thrombi in the left atrial appendage and the left atrium basis (Fig. 2a–c, 3c–d; Video 2, 3). The origination of the right atrial thrombus from the superior vena cava was also demonstrated (Fig. 2d, Video 4). ICD lead was observed to be thickened, which was considered secondary to thrombus burden (Fig. 3a, b). Thrombophilia panel was obtained from the patient’s venous blood sample before starting intravenous

heparin therapy. Heparin therapy was carried on for a week without stopping. Biochemical tests were normal for factor V Leiden mutation, protein C-S deficiency, prothrombin gene mutation, MTHFR gene mutation, thrombomodulin gene mutation,

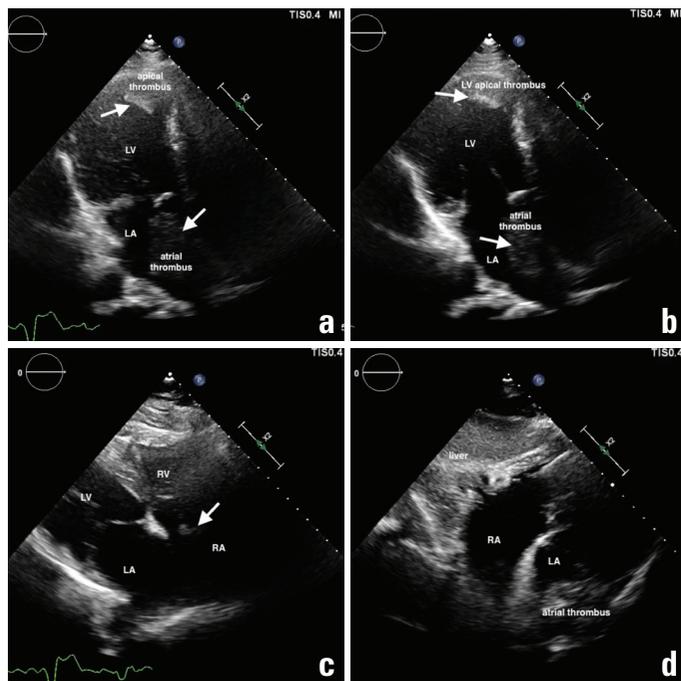


Figure 1. Figure 1a–b showing left ventricular apical and left atrial thrombi images of transthoracic echocardiography. Figure 1c showing right atrial thrombus in modified apical four-chamber view. Figure 1d shows left atrial thrombus in subcostal view

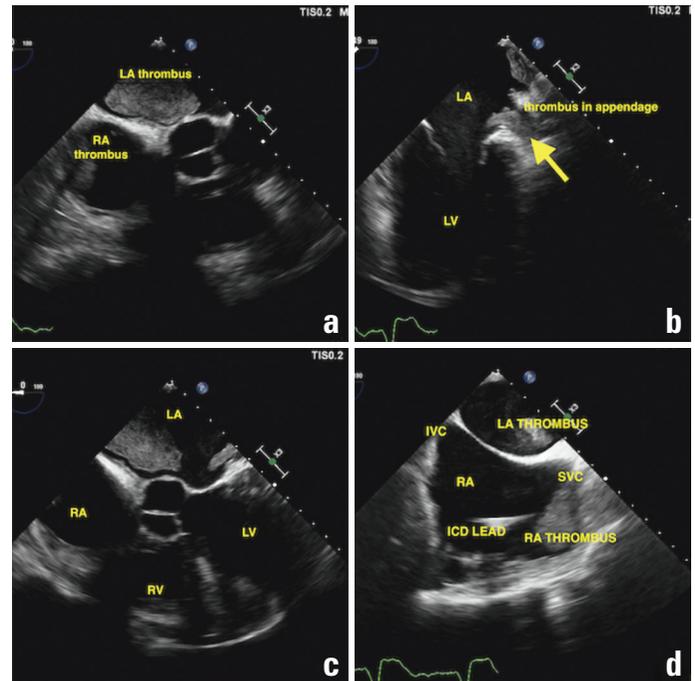


Figure 2. Figure 2a–c showing giant left atrial thrombi in 2d transesophageal echocardiography. Figure 2d shows left atrial thrombus and right atrial thrombus originating from superior vena cava

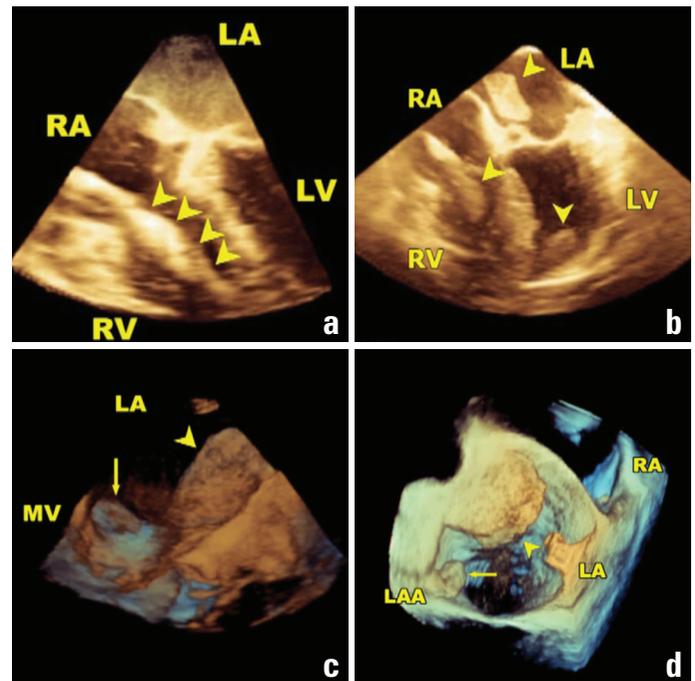


Figure 3. Images from 3D transesophageal echocardiography. Figure 3a, b showing left atrial, left ventricular thrombi, and thickened ICD lead secondary to thrombus burden. Figure 3c,d showing giant thrombi in the left atrium and left atrial appendage.

hyperhomocysteinemia, and other rheumatological diseases. Antithrombin III was interestingly detected as 55% of the reference level. Antithrombin concentrates were also initiated after the A3-D diagnosis. After 2 weeks, TEE was repeated, but the giant thrombi persisted; therefore, the option of surgery was offered to the patient. However, the patient refused the operation because of high risk under informed consent, and he was discharged from our hospital under warfarin, ticargrelor, and acetyl-salicylic acid therapy.

Video 1. TTE video indicating left ventricular apical thrombus and giant left atrial thrombus.

Video 2. TEE video showing giant left atrial thrombus.

Video 3. TEE video showing thrombus in the left atrial appendage and its x-plane reflections.

Video 4. TEE images showing left atrial thrombus and right atrial thrombus originating from the superior vena cava.

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at www.anatoljcardiol.com
DOI:10.14744/AnatolJCardiol.2016.7456
