

A large left ventricular thrombus resolved with dual antiplatelet therapy in combination with acenocoumarol in a young patient after acute inferior myocardial infarction

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Summary

Objective: To present a rare case with thrombus resolved with dual antiplatelet in combination with acenocoumarol. **Case presentation:** A 35-year-old man with a history of cerebral venous thrombosis was admitted to our hospital for an acute myocardial inferior infarction. He underwent primary percutaneous intervention of the right coronary artery with proximal to distal stent placement. On the next day, bedside echocardiography revealed a huge mobile thrombus in the left ventricle. Cardiac magnetic resonance also imaging confirmed the presence of a large left ventricular thrombus. The Heart Team assessed the case and recommended surgical intervention. However, the patient refused to undergo the surgery. Thus, he received dual antiplatelet therapy with acenocoumarol aimed at achieving a therapeutic international normalized ratio ranging from 2.0 to 3.0. After 2 months of treatment, the left ventricular thrombus disappeared on echocardiography as well as in cardiac magnetic resonance imaging. **Conclusion:** Our case illustrates that dual antiplatelet and acenocoumarol therapy, within an effective therapeutic range, can have thrombolytic action on a huge acute intracardiac thrombus.

Keywords: Left ventricular thrombus, acute inferior myocardial infarction.

1. Background

Left ventricular (LV) thrombi are most frequently observed in patients with large anterior ST-elevation myocardial infarction (STEMI) and anteroapical aneurysm [1]. However, such thrombi are rarely associated with inferior MI. According to Virchow's theory, intracavitary blood stasis and contact with the fibrous tissue in an aneurysm are considered risk factors for clot formation [2]. In the pre-reperfusion era, incidence of LV thrombi was as high as 40% in

patients with anterior infarctions, most of LV thrombi developed within the first 2 weeks [3]. Owing to the development of reperfusion techniques by thrombolysis or primary percutaneous coronary intervention, the incidence of LV thrombi has dramatically decreased [6]. Warfarin is prescribed more frequently than acenocoumarol because of its longer half-life [5]. Here we report an unusual case LV thrombus after inferior acute MI in a young patient who was effectively treated with dual antiplatelet therapy in combination with acenocoumarol.

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2. Case presentation

A 35-year-old, non-smoker man was admitted to our emergency department due to severe chest pain, breathlessness. Electrocardiogram showed ST elevation on leads D2, D3, aVF. Serum troponin and CK-MB also increased significantly.

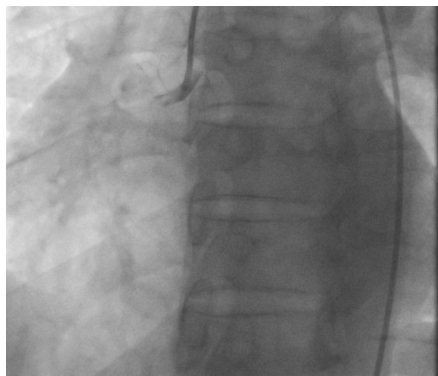


Figure 1. Total occlusion of the proximal right coronary artery

Medical records revealed that he had cerebral venous thrombosis and was discharged from our hospital on a regular novel oral anticoagulant treatment (September, 2016). Tests for prothrombotic conditions (including protein C and S levels and antithrombin deficiency) and antiphospholipid syndrome were negative.

On the next day after ICU admission, bedside echocardiography showed a huge 3.2×4.1 cm echocontrast in the left ventricle, which was difficult to differentiate from a cardiac tumor that may cause coronary distal embolization. A transthoracic echocardiogram also showed normal systolic function with an ejection fraction of 60% without wall motion abnormality. Because of the uncertainty of the pathology of the left ventricle, a cardiac magnetic resonance imaging (CMRI) study was performed. CMRI confirmed the presence of LV thrombus (Figure 3). The patient was assessed by the Heart Team, but he refused to undergo any surgical intervention.

He was diagnosed acute myocardial inferior infarction. He underwent right coronary revascularization with the placement of two drug-eluting stents (Figure 1 and 2).

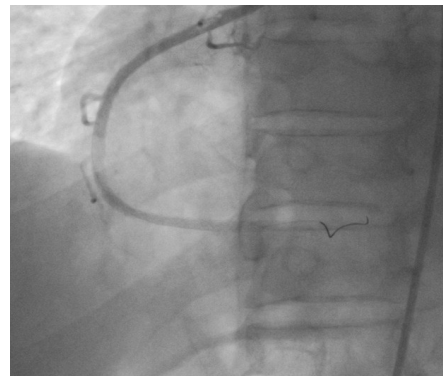


Figure 2. Revascularization of the right coronary artery with two stents; thrombolysis in myocardial infarction flow II

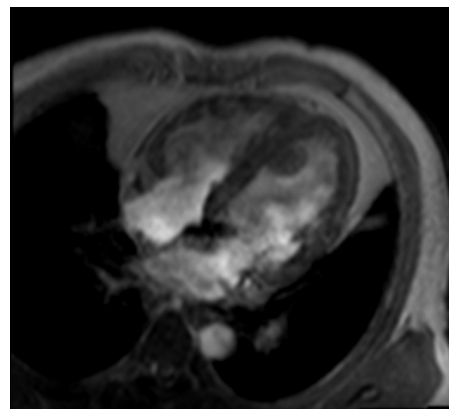


Figure 3. Left ventricular thrombus on magnetic resonance imaging

The patient was initiated on dual antiplatelet (aspirin 100mg \times once per day and clopidogrel 75mg once per day) in combination with acenocoumarol - a vitamin K antagonist. He was closely followed up aiming for an therapeutic international normalized ratio target of 2.0 - 3.0. The other medications (beta blockers and angiotensin-converting enzyme inhibitors) were prescribed according to recommendations. After 2 months of therapy, the LV echocontrast disappeared and the patient did not present with additional thromboembolic events during the 1-year follow-up (Figure 4).

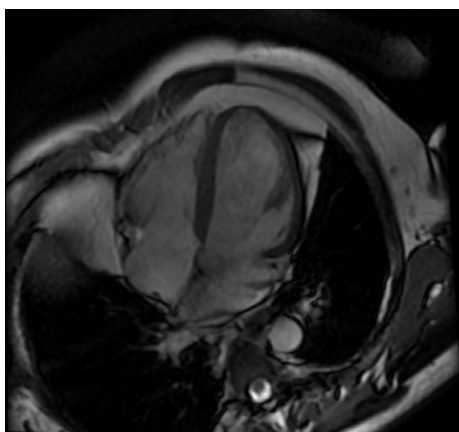


Figure 4. Left ventricular thrombus resolved after 2 months of treatment

3. Discussion

Acute MI in young patients is associated with two key risk factors: Male sex and smoking. Additional etiologies may include coronary spasm, Kawasaki's disease, congenital coronary abnormality, and systemic lupus erythematosus. The main risk factor in our patient was multiple thromboembolic events for which other underlying prothrombotic syndromes were ruled out.

With this case, we demonstrated that LV thrombi can develop even at a very young age. In this case, the condition could be treated with anticoagulation without any embolic complications and without the need for urgent surgical intervention. The development of an apical LV thrombus after anterior infarction and/or dilated cardiomyopathy is not a rare entity, particularly in cases of apical aneurysms [6]. Weinreich et al studied 261 patients and found that this complication occurred in 34% cases of anterior wall infarction but in only 1.5% cases of inferior wall infarction. Morphologic changes in the thrombus have been reported to be the most powerful predictor of embolism, followed by the protruding shape of the thrombus [8]. In our case, surfaces of the thrombus were quite smooth. In addition, the patient refused to undergo any surgical intervention; therefore, we decided to

manage this case with conservative medical treatment.

The mechanism by which acenocoumarol exerts its thrombolytic activity remains unclear. Yasaka et al [9] reported that high plasma levels of fibrinopeptide B β 15-42 and D-dimer reflect increased fibrinolytic activity, and the presence of fibrinopeptide A indicates plasma hypercoagulation. After administration of coumadin, the ratio of fibrinopeptide A over fibrinopeptide B β 15-42 and D-dimer was low. Therefore, the fibrinolytic activity became predominant over plasma hypercoagulation and thus led to thrombus resolution. The question of which thrombus can be resolved with acenocoumarol is hard to answer. Neimann et al [10] suggested that only recently developed thrombi can be resolved, but not old ones. They also reported a case of an LV thrombus that was resolved with dabigatran treatment, which, according to the author, was possible because the thrombus had developed recently.

According to the literature, large and mobile thrombi are usually treated with surgical thrombectomy. However, outcomes are limited, and the patients are at high risk of thromboembolism and the risk of thromboembolism is higher for patients treated with anticoagulants than for those treated by a surgical approach. In this case, we strongly recommended that this patient undergo surgical thrombectomy. However, because he refused to undergo surgical treatment, we were left with no other choice but to manage his condition conservatively.

4. Conclusion

Although thrombus formation is a rare complication after acute inferior myocardial infarction, our case showed that we can use the combination of dual antiplatelet with vitamin K antagonists to treat such a thrombus.

References