

# Ultrasound Traced the Embolization of Lower Extremity Artery to Left Ventricular Thrombus: A Case Report

Hexia Du, Wei Xu

The First Affiliated Hospital of Yangtze University, Jingzhou, China  
Email: 528628364@qq.com

**How to cite this paper:** Du, H.X. and Xu, W. (2023) Ultrasound Traced the Embolization of Lower Extremity Artery to Left Ventricular Thrombus: A Case Report. *Yangtze Medicine*, 7, 185-190.  
<https://doi.org/10.4236/ym.2023.73019>

**Received:** August 28, 2023

**Accepted:** September 23, 2023

**Published:** September 26, 2023

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## Abstract

This paper reports a case of a 38-year-old young man with a lower extremity arterial thrombus diagnosed by ultrasound, which was traced back to the left ventricular thrombus. By reviewing the relevant literature, the relationship between lower extremity arterial thrombosis and left ventricular thrombosis is described, and which examination method is the most valuable in the diagnosis of thrombosis is discussed.

## Keywords

Ultrasound, Left Ventricular Thrombus, Arterial Embolism

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## 1. Introduction

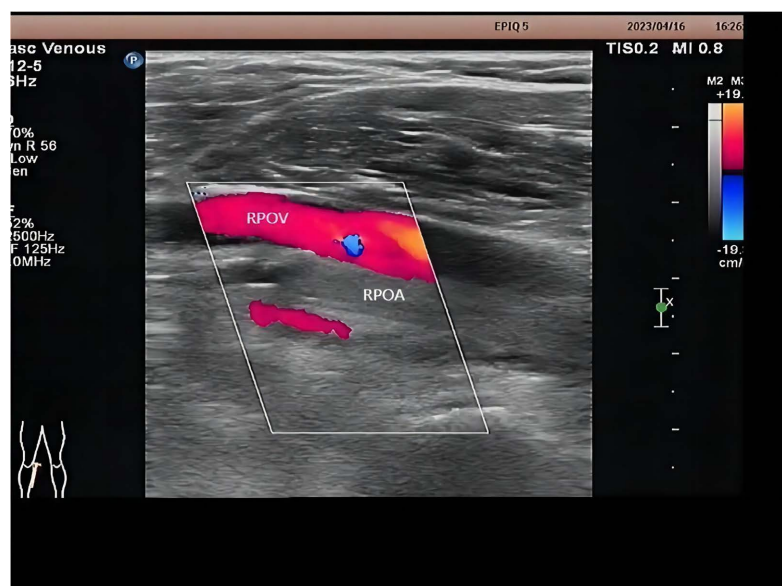
With the development of chest pain centers in hospitals at all levels, most patients with myocardial infarction can get immediate treatment, and the incidence of complications related to myocardial infarction has been greatly reduced. Left ventricular thrombosis is one of the complications after myocardial infarction. When the left ventricular thrombus falls off, it can easily embolize the brain, internal organs and limbs. The patient initially presented with symptoms of acute limb ischemia, and ultrasonography revealed the presence of a lower extremity arterial thrombus which was subsequently traced back to the left ventricular thrombus. Due to the patient's carelessness and the delay in treatment, the prognosis for this patient was unfavorable.

## 2. Case Report

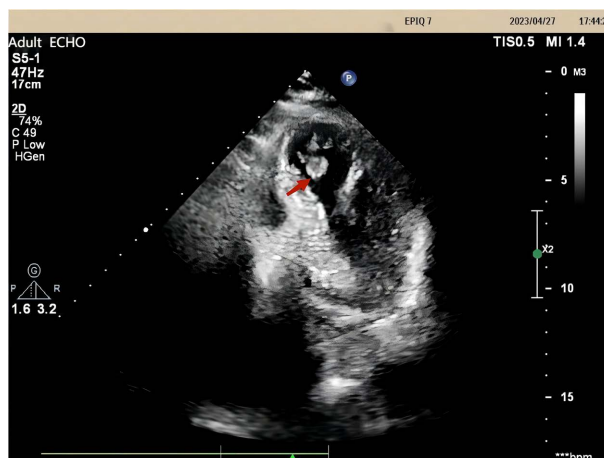
A 38-year-old man whose right lower limb had been painful and swollen for 1

day came to our outpatient. We found embolism (**Figure 1**) in the right popliteal artery, anterior tibial artery, and posterior radial artery when we performed the lower extremity vascular ultrasound. We began to wonder why the embolism was occurring in the arteries at such a young age and where it came from. Unfortunately, he didn't come to our hospital until 15 days later with pain and numbness in his right lower limb.

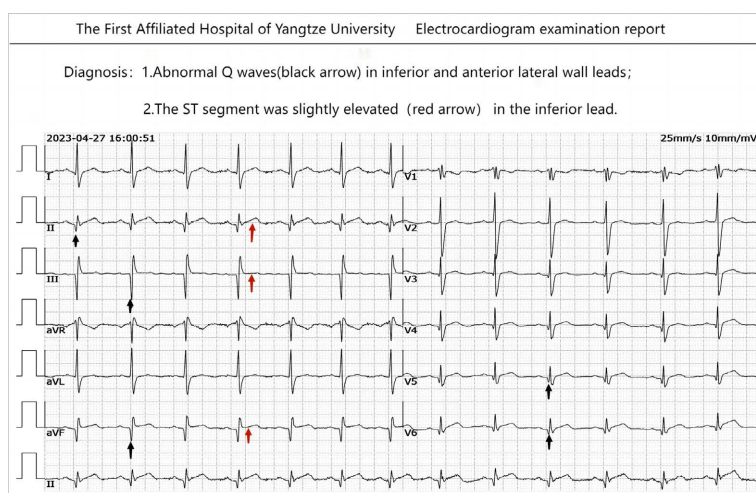
After the patient was hospitalized, the doctor inquired about his medical history, and found that the patient had chest pain 1 month ago, and denied the history of infectious diseases such as hypertension, coronary heart disease, diabetes, hepatitis, and tuberculosis. During physical examination, swelling, pain and numbness of the right lower limb were found, and temperature of the skin decreased significantly, mainly below the knee joint. The pulse of the right popliteal artery and dorsal foot artery was not touched, and the left lower limb was normal. Blood coagulation analysis showed FIB 3.55 g/l, APTT 20.90 s, DD 3.39 mg/l, fibrin degradation products 7.60  $\mu$ g/ml. Myocardial enzyme showed hypersensitive troponin I 4.87 pg/ml, B type natriuretic peptide 10.11 pg/ml. The ECG results showed sinus rhythm, abnormal Q wave in the lower and anterior wall leads, differences in indoor conduction and changes in ST segment (**Figure 2**). Because the patient was so young and had chest pain in the past, we began to wonder if the patient had a myocardial infarction. As expected, when we gave the patient a color ultrasound, we found a slightly high echo mass in the left ventricular apex (**Figure 3**), which is likely to be a thrombus. In addition, the patient's lower extremity artery CTA results showed soft plaque (**Figure 4**) in the middle and lower segment of the right femoral artery, lumen occlusion. The lower segment vessels were not developed, and some peripheral collateral vessels were developed.



**Figure 1.** Ultrasound: hypoechoic filling was observed in the right popliteal artery without obvious blood flow signal.



**Figure 2.** TTE: a slightly hyperechoic mass about 18 \* 10 mm in size was seen at the apex of the left ventricle.

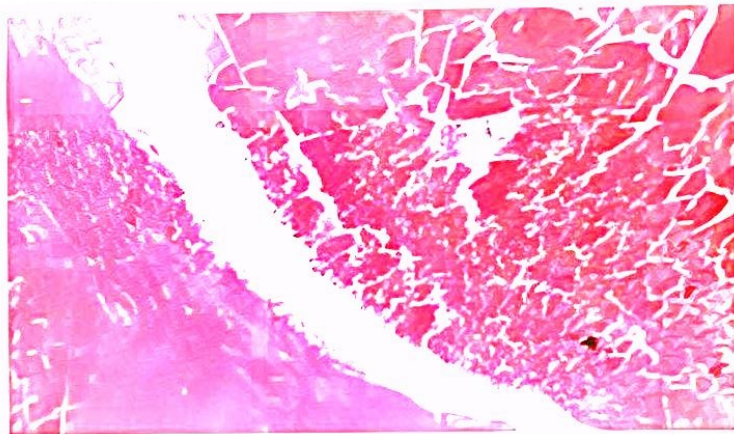


**Figure 3.** ECG: sinus rhythm, abnormal Q wave in the lower and anterior wall leads, differences in indoor conduction and changes in ST segment.



**Figure 4.** CTA: see the right femoral lower-middle section calcium soft spot, lumen out-of-the-way, did not see its period of vascular imaging, part of the collateral vessels around development.

Therefore, the patient underwent an emergency balloon thrombectomy via a femoral artery incision, successfully removing the embolus with a total length of 10 cm. Postoperative pathological findings confirmed that the embolus was a thrombus (Figure 5). After operation, the patient was treated with anticoagulant and vasodilator therapy, and oral analgesics were used to relieve symptoms. But the patient still had intermittent pain in the right sole, which was difficult to tolerate after prolonged activity, and no other special discomfort was reported. One month later, CTA of the lower extremity arteries in the outpatient clinic showed soft plaque in the middle and lower segment of the right femoral artery, with lumen occlusion, and its lower segment vessels were not observed. A soft plaque was seen in the middle and upper segment of the right peroneal artery, and some of the lumen was poorly developed (Figure 6). After several follow-up visits, the patient still complained of pain and weakness in the right lower limb.



**Figure 5.** Postoperative pathology showed that the embolus was thrombus.



**Figure 6.** CTA one month after surgery: soft plaque in the middle and lower segment of the right femoral artery, with lumen occlusion, and its lower segment vessels were not observed. A soft plaque was seen in the middle and upper segment of the right peroneal artery, and some of the lumen was poorly developed.

### 3. Discussion

Emboli in lower extremity arterial embolism mainly come from cardiogenic sources. The most common cardiogenic cause is atrial fibrillation, followed by rheumatic heart disease and myocardial infarction at present [1]. It is a clinical emergency, common femoral artery, popliteal artery, and common iliac artery are the most common sites of occurrence. Its typical clinical signs and symptoms are pain, numbness, dyskinesia, pulselessness and pallor. With the increase of the elderly population in our country, its incidence is also increasing, however it rarely happens in young people. In similar cases that have been reported, the youngest patient is 50 years old [2] [3]. The present patient was a young man aged 38 years with no history of any disease. Arterial embolism of the lower extremity was caused by a detached embolus that formed after a myocardial infarction. This young patient had no typical symptoms of chest pain and no previous underlying medical conditions. Because of his low awareness and attention to myocardial infarction, when the left ventricular thrombus was found on ultrasound, the myocardial infarction markers of the patient returned to normal, with only pathological Q waves in the lower and anterior walls remaining on the ECG.

Although the incidence of left ventricular thrombosis after myocardial infarction is reduced with thrombolysis, it is still as high as 40%, especially in patients with large-scale myocardial infarction. Studies have shown that TTE is recommended to be reexamined within 72 hours and 1 to 2 weeks for patients with high-risk characteristics who did not find left ventricular thrombus on initial transthoracic echocardiography [4].

TTE is currently the most commonly used imaging test for evaluating left ventricular thrombosis. TTE has high diagnostic accuracy for LV thrombus after acute MI with specificity in the range of 95% to 98% offset by relatively low sensitivity (21% - 35%) [5]. The low sensitivity of TTE in monitoring left ventricular thrombosis may lead to the occurrence of missed thrombosis, which may be caused by insufficient display of apical view, small thrombus, poor acoustic window and other reasons. With the use of ultrasound contrast material to increase the clarity of endocardial visualization, the sensitivity increases to approximately 64%, and the specificity is similar to that of TTE [6]. The left ventricular thrombus is mostly located in the apex, and the apical view is not well visualized on ultrasound scan. As a consequence, when we examine the patient after myocardial infarction, we must scan multiple ultrasound sections and angles to avoid missed diagnosis. Ultrasound is a commonly used means of clinical disease examination, which can clearly display the disease site and peripheral signs, color Doppler ultrasound can visually show whether there is blood perfusion in the tissue, both of them have unique advantages in the diagnosis and differentiation of lower extremity arterial thrombosis and left ventricular thrombosis.

### 4. Conclusion

With the poor prognosis reported in this patient, we should emphasize the value

of ultrasound in the early diagnosis of thrombosis, especially in patients with myocardial infarction, whose heart should be monitored regardless of whether the symptoms are prominent. Early detection and early treatment can effectively improve the prognosis of patients with thrombosis.

### Statement

The study doesn't directly contact with the patient, only review imaging and pathological data of patients, not as an aid in the diagnosis and any commercial purposes, and the results of the study will remove any participant identify characters, ensure privacy don't leak out. The Ethics Committee of our hospital has proposed an application for exempting the informed consent of the subjects and has been approved.

### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

### References

- [1] Ferrer, C., Cannizzaro, G.A., Borlizzi, A., *et al.* (2023) Acute Ischemia of the Upper and Lower Limbs: Tailoring the Treatment to the Underlying Etiology. *Seminars in Vascular Surgery*, **36**, 211-223. <https://doi.org/10.1053/j.semvascsurg.2023.04.006>
- [2] Ahmed, T., Ahmed, T. and Haque, R. (2020) ST-Elevation Myocardial Infarction Presenting as Acute Limb Ischemia. *Cureus*, **12**, e10432. <https://doi.org/10.7759/cureus.10432>
- [3] Agarwal, K.K., Douedi, S., Alshami, A., *et al.* (2020) Peripheral Embolization of Left Ventricular Thrombus Leading to Acute Bilateral Critical Limb Ischemia: A Rare Phenomenon. *Cardiology Research*, **11**, 134-137. <https://doi.org/10.14740/cr1030>
- [4] Camaj, A., Fuster, V., Giustino, G., *et al.* (2022) Left Ventricular Thrombus Following Acute Myocardial Infarction: JACC State-of-the-Art Review. *Journal of the American College of Cardiology*, **79**, 1010-1022. <https://doi.org/10.1016/j.jacc.2022.01.011>
- [5] Delewi, R., Nijveldt, R., Hirsch, A., *et al.* (2012) Left ventricular Thrombus Formation after Acute Myocardial Infarction as Assessed by Cardiovascular Magnetic Resonance Imaging. *European Journal of Radiology*, **81**, 3900-3904. <https://doi.org/10.1016/j.ejrad.2012.06.029>
- [6] Weinsaft, J.W., Kim, J., Medicherla, C.B., *et al.* (2016) Echocardiographic Algorithm for Post-Myocardial Infarction LV Thrombus: A Gatekeeper for Thrombus Evaluation by Delayed Enhancement CMR. *JACC Cardiovascular Imaging*, **9**, 505-515. <https://doi.org/10.1016/j.jcmg.2015.06.017>