

ACUTE LIMB ISCHEMIA PRESENTING AS A CLINICAL CONUNDRUM: STROKE MIMIC OR AORTIC DISSECTION?

Yusuke Hirao¹, Bradley Fujiuchi¹, Kevin Benavente¹, Clarke Morihara¹, Ayumi Sakamoto¹, Nathan Itoga², Joseph Lee²

¹ Department of Medicine, John A. Burns School of Medicine, University of Hawai'i, Honolulu, USA

² The Queen's Medical Center, Honolulu, USA

Corresponding author's e-mail: pcss.yusuke0121@gmail.com

Received: 05/03/2025

Accepted: 11/03/2025

Published: 26/03/2025

Conflicts of Interests: The Authors declare that there are no competing interests.

Patient Consent: Written informed consent was obtained from the patient for publishing his clinical history.

Acknowledgments: We would like to express our sincere appreciation to the patient in this case report.

This article is licensed under a **Commons Attribution Non-Commercial 4.0 License**

How to cite this article: Hirao Y, Fujiuchi B, Benavente K, Morihara C, Sakamoto A, Itoga N, Lee J. Acute limb ischemia presenting as a clinical conundrum: stroke mimic or aortic dissection? *EJCRIM* 2025;12:doi:10.12890/2025_005317

ABSTRACT

Patients with atrial fibrillation and transthyretin amyloid cardiomyopathy (ATTR-CM) have been found to have a very high incidence of intracardiac thrombus and thromboembolic disease. Acute limb ischemia is a rare, highly morbid condition that may mimic other medical emergencies. An 88-year-old male with ATTR-CM presented with left sided hemiparesis and paraesthesia. Computed tomography scan and magnetic resonance imaging of the head was negative for stroke. Subsequent computed tomography angiography (CTA) of the chest was obtained due to an abnormal interarm blood pressure differential which was negative for acute aortic dissection but revealed simultaneous occlusions of the left axillary and common femoral arteries. These occlusions were presumed to be cardioembolic from a left atrial appendage thrombus concurrently visualized on CTA. This case highlights the importance of avoiding anchoring bias, and systematically reevaluating the differential diagnosis in cases where the initial workup is unrevealing. While an uncommon entity, simultaneous upper and lower acute limb ischemia should be considered in patients with atrial fibrillation and prothrombotic comorbidities, such as ATTR-CM.

KEYWORDS

Acute limb ischemia, atrial fibrillation, transthyretin amyloid cardiomyopathy

LEARNING POINTS

- Acute limb ischemia can mimic stroke and aortic dissection, requiring a broad differential diagnosis in patients with atrial fibrillation and transthyretin amyloid cardiomyopathy.
- A systematic vascular-anatomic approach helps identify embolic events when initial stroke imaging is negative.
- Acute ischemia may be indicated by lactic acidosis without hemodynamic instability, which should lead to additional vascular assessment.

INTRODUCTION

Acute limb ischemia (ALI) is a rare, potentially life-threatening condition with an estimated incidence of 14 cases per 100,000 people annually. Morbidity and mortality remain high, as 10-30% of patients undergo amputation within 30 days and mortality is estimated at 9-25%^[1]. Causes of ALI are largely divided into embolic and atherosclerotic events, with emboli (46.2%) being most common, followed by atherosclerosis (23.7%), multifactorial causes (20.4%) and stent occlusion (9.7%)^[2]. Underlying peripheral vascular disease is a frequent risk factor, however embolic disease may affect patients with otherwise normal vasculature. Notably, the incidence of intracardiac thrombus amongst patients with ATTR-CM has been reported to be as high as 81%^[3], and amongst patients with atrial fibrillation, the risk of thromboembolic disease is 2.4 times higher in patients with transthyretin amyloid cardiomyopathy (ATTR-CM), compared to those without ATTR-CM^[4]. Classically ALI presents with sudden onset pain, pallor, poikilothermia, pulselessness, paraesthesia and paralysis. In patients with underlying comorbidities and an incomplete presentation, differentiating ALI from other vascular emergencies such as stroke or aortic dissection may be challenging^[5]. Here we discuss a patient who presented with left-sided hemiparesis and paraesthesia initially suggestive of either aortic dissection or stroke but was later found to have simultaneous arterial emboli to both left sided upper and lower extremities.

CASE DESCRIPTION

An 88-year-old male with history of paroxysmal atrial fibrillation, ATTR-CM, type 2 diabetes and dyslipidaemia presented with sudden onset left upper and lower extremity weakness and numbness. Strength was noted to be 4/5 throughout the left upper and lower extremities. Vital sign assessment revealed a blood pressure of 161/69 mmHg measured on the right arm and 57/18 mmHg on the left arm. A code-stroke was activated upon arrival, however computed tomography (CT) scan and magnetic resonance imaging (MRI) of the brain proved negative for acute ischemic infarcts. CT angiography of the chest and abdomen was performed and, while negative for aortic dissection, identified near complete occlusion of the left axillary artery, complete occlusion of the left common femoral artery, and a thrombus present in the

left atrial appendage (Fig. 1 and 2). By this time, pulses had become unidentifiable by Doppler and a lactic acidosis up to 8.6 mEq/l was noted. Further questioning revealed that the patient had been non-adherent to his prescribed apixaban due to difficulty obtaining refills. A diagnosis of acute limb ischemia secondary to cardioembolic phenomena was made and he was started on unfractionated heparin. Vascular surgery was consulted, and the patient underwent urgent thrombectomy of the left common femoral, popliteal and tibial-peroneal, and left axillary arteries. Improvements in strength and pulses were noted immediately following the procedure. His anticoagulation regimen was increased to apixaban 5 mg twice a day and ultimately discharged home 2 days later.

DISCUSSION

This case highlights a uniquely challenging presentation of acute limb ischemia due to cardiac embolism disguised as a stroke and aortic dissection. In this patient with known atrial fibrillation, the simultaneous development of left upper and lower extremity weakness and numbness, initially without significant pain, pallor, poikilothermia, or pulselessness, was highly suspicious of a cerebrovascular accident. However, negative stroke findings on CT scan and MRI necessitated consideration of other aetiologies.

Vital signs were significant for discrepancies in blood pressure between the right and left arms, raising suspicion for aortic dissection. Although an interarm blood pressure differential greater than 20 mmHg can be an independent predictor of aortic dissection, a significant proportion of the general population in the United States, up to 19%, exhibit this discrepancy^[6], which is further associated with all-cause and cardiovascular mortality^[7]. This reinforces the importance of ruling out other conditions when typical symptoms like chest pain are absent.

Up to 15% of patients with ALI may not present with extremity pain^[8]. In patients with comorbidities such as diabetes or dyslipidaemia, an additional challenge comes in distinguishing acutely diminished pulses from chronic vascular disease. Furthermore, the neurologic exam can be further obfuscated by chronic peripheral neuropathy induced by amyloid deposition in patients with ATTR-CM^[9]. This atypical presentation and these underlying conditions in our patient obscured the diagnosis initially. However,

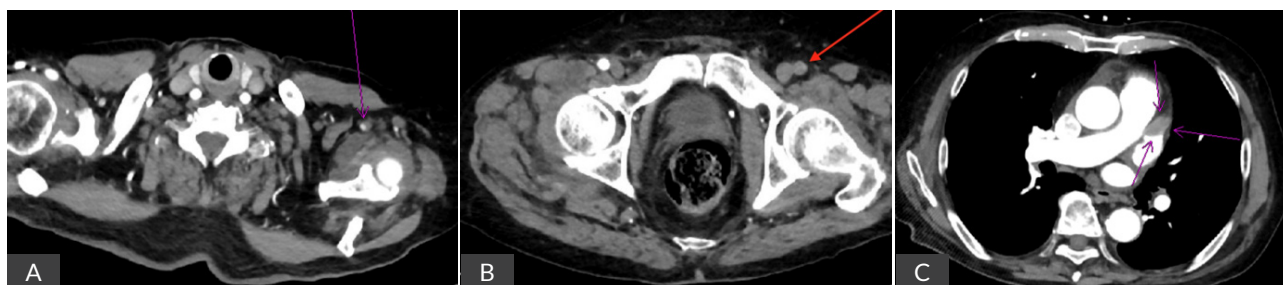


Figure 1. Contrast-enhanced computed tomography imaging findings demonstrating vascular abnormalities: A) Partial visualization of severe, near-occlusive stenosis in the left axillary artery (purple arrow); B) Complete occlusion of the left common femoral artery (red arrow); C) Thrombus in the left atrial appendage (purple arrows).

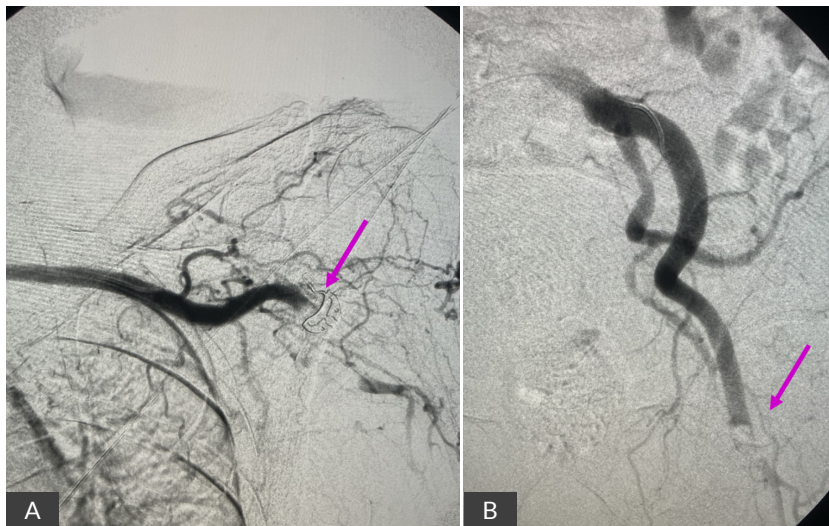


Figure 2. Angiographic findings highlighting significant arterial occlusions: A) Occlusion in the left axillary artery (purple arrow); B) Occlusion of the left common femoral artery (purple arrow).

the presence of significant lactic acidosis prompted the consideration of acute, rather than chronic localized ischemia, particularly in the absence of corresponding hemodynamic instability.

Because ATTR-CM significantly increases the risk of intracardiac thrombus and embolic events, with elevated event-rates demonstrated even after initiation of anticoagulation^[10], consideration of a cardioembolic aetiology must be prioritized when evaluating acute neurologic changes. While multifocal cerebrovascular stroke due to cardiac emboli is a well-recognized phenomenon, peripheral emboli to multiple peripheral arteries is exceedingly rare, and the distribution of emboli simultaneously to both the unilateral upper and lower extremities has only been rarely reported in the literature^[11]. Here we highlight the importance of considering a systematic vascular-anatomic approach in acutely hemiparetic patients with highly pro-embolic comorbidities, such as ATTR-CM and atrial fibrillation. Starting with an evaluation for cerebrovascular infarcts and irregularities, the central arterial system should be subsequently investigated for aortopathies and cardiac thrombi, followed by a thorough examination of the peripheral arterial supply for ALI. By employing a stepwise approach, vascular emergencies can be identified and treated promptly. This can be especially helpful in patients where the presentation and physical exam is misleading, and immediate diagnostic tests rule out initially suspected aetiologies.

REFERENCES

1. Arnold J, Koyfman A, Long B. High risk and low prevalence diseases: Acute limb ischemia. *Am J Emerg Med* 2023;**74**:152-158.
2. Howard DP, Banerjee A, Fairhead JF, Hands L, Silver LE, Rothwell PM. Oxford Vascular Study. Population-Based Study of Incidence, Risk Factors, Outcome, and Prognosis of Ischemic Peripheral Arterial Events: Implications for Prevention. *Circulation* 2015;**132**:1805-1815.
3. El-Am EA, Dispenzieri A, Melduni RM, Ammash NM, White RD, Hodge DO et al. Direct Current Cardioversion of Atrial Arrhythmias in Adults With Cardiac Amyloidosis. *J Am Coll Cardiol* 2019;**73**:589-597.
4. Bukhari S, Barakat AF, Eisele YS, Nieves R, Jain S, Saba S et al. Prevalence of Atrial Fibrillation and Thromboembolic Risk in Wild-Type Transthyretin Amyloid Cardiomyopathy. *Circulation* 2021;**143**:1335-1337.
5. Rutherford RB, Baker JD, Ernst C, Johnston KW, Porter JM, Ahn S et al. Recommended standards for reports dealing with lower extremity ischemia: revised version. *J Vasc Surg* 1997;**26**:517-538.
6. Singer AJ, Hollander JE. Blood pressure. Assessment of interarm differences. *Arch Intern Med* 1996;**156**:2005-2008.
7. Clark CE, Warren FC, Boddy K, McDonagh STJ, Moore SF, Goddard J et al. Associations Between Systolic Interarm Differences in Blood Pressure and Cardiovascular Disease Outcomes and Mortality: Individual Participant Data Meta-Analysis, Development and Validation of a Prognostic Algorithm: The INTERPRESS-IPD Collaboration. *Hypertension* 2021;**77**:650-661.
8. Busuttill RW, Keehn G, Milliken J, Paredero VM, Baker JD, Machleder HI et al. Aortic saddle embolus. A twenty-year experience. *Ann Surg* 1983;**197**:698-706.
9. Grogan M, Dispenzieri A. Carpal Tunnel Syndrome and Cardiac Amyloidosis: When Are Numb Hands a Window to the Heart? *J Am Coll Cardiol* 2022;**80**:978-981.
10. Vilches S, Fontana M, Gonzalez-Lopez E, Mitrani L, Satri G, Renju M et al. *Eur J Heart Fail* 2022;**24**:1387-1396.
11. Pěčová M, Benko J, Pěč MJ, Bolek T, Hurtová T, Sokol J et al. Unilateral upper and lower limb ischemia mimics stroke: a case report. *J Med Case Rep* 2024;**18**:66.