RESEARCH PAPER

Right Finger Claudication following a Right Subclavian Artery Thrombus: A Case Report

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ABSTRACT
We report a 49-year-old female, a known hypertensive, who presented with complaints of pain, swelling and bluish discoloration of the right ring finger following a minor field injury. Despite preserved peripheral pulses, CT angiography of right lower limb revealed a hypodense-filling defect of size 19 x 7 x 6 mm in the right subclavian artery, suggestive of right subclavian arterial thrombus as the cause of claudication. Initiation of unfractionated heparin followed by rivaroxaban, cilostazol, and antiplatelet therapy led to clinical improvement, avoiding any catastrophe sequelae. This case report highlights the diagnostic challenge of subclavian artery thrombosis presenting as isolated digital ischemia with preserved distal pulses, the importance of CT angiography in early recognition, and timely anti-coagulation to stall the progression of disease condition.

Keywords: Subclavian Artery Thrombosis, Digital Claudication, Finger Ischemia, Upper Limb Ischemia, Unfractionated Heparin, Rivaroxaban, Cilostazol

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INTRODUCTION

Claudication refers to a condition characterized by muscle pain, cramping or fatigue caused by insufficient blood flow secondary to arterial occlusion. While most commonly associated with lower extremity disease, claudication can also occur in the upper limbs — a condition referred to as *digital claudication* when it involves the fingers. Digital claudication manifests as pain, numbness, pallor, or coolness of the affected fingers, usually triggered by physical activity or cold exposure, which increases the demand for oxygenated blood that the constricted arteries fail to supply.

The subclavian artery, located just beneath the clavicle, is a key vessel that provides blood to the upper limbs, portions of the neck, shoulder, and parts of the chest wall; it also gives rise to the vertebral artery, which contributes to posterior cerebral circulation. [1] A thrombus in the subclavian artery can therefore lead to a significant reduction in blood flow, particularly to the distal extremities, like the fingers. Thrombosis can result from a variety of causes, including atherosclerosis — the most common etiology — as well as vasculitis, fibromuscular dysplasia, radiation-induced arterial injury, trauma, embolism, or hypercoagulable states. [2]

The risk of possible catastrophic clinical sequelae necessitates early identification, to prevent long-term ischemic damage to the hand and fingers and to preserve limb function. Treatment typically involves a combination of pharmacological therapies, such as anticoagulation or thrombolysis, while some cases may require endovascular or surgical intervention. [3] This case report aims to highlight the diagnostic approach and therapeutic considerations in a patient presenting with digital claudication with preserved peripheral pulses — a combination that can pose a significant diagnostic challenge.

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CASE REPORT

A 49-year-old female presented to the emergency department with complaints of pain, swelling, and bluish discoloration of the right ring finger since 1 day. The patient was apparently asymptomatic 3 days prior to presentation, when she sustained an injury over the right ring finger (a 1×1 cm wound on the medial aspect of the right ring finger) while working in the field. The following day, the patient noticed bluish discoloration over the tip of the same finger, along with severe tenderness on contact with any object. Some discoloration and mild tenderness was noted over the adjacent right middle finger as well. [Figure 1] The patient also reported one spike of fever on the night of the injury

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Figure 1: Bluish discoloration over the right ring finger and partly over middle finger; with a minor injury mark on the medial aspect of the right ring finger.

The patient gives no history of similar complaints in the past in either of the digits or limbs or history of chest pain, myocardial infarction, giddiness, stroke, abdominal pain or joint pain. The patient is a known case of hypertension since last 3 months, with no history of diabetes mellitus, thyroid Disorder, tuberculosis, or bronchial asthma. The patient gives no history of smoking, tobacco consumption or any other form of addiction. General examination revealed bilateral pitting edema, with no pallor, icterus, cyanosis, clubbing, or lymphadenopathy. Vital parameters: blood pressure 130/90mmHg, pulse rate 76/min, saturation 98% on room air. All peripheral pulses were examined, all of which were normal in volume, character, and regular in rhythm. There was no evident radio-radial or radio-femoral delay. Cardiovascular examination: S1 and S2 normal. CNS examination: Conscious, oriented, no focal neurological deficit. Respiratory examination: bilateral vesicular breath sounds. Per-abdominal examination: soft, non-tender, no organomegaly.

Investigations

Table 1 — Laboratory Investigations

Parameter	Value	Reference Range
Haemoglobin	12.5 g/dL	11.6–15.0 g/dL
TLC (N|L|M)	**11,660 /µL** (64|21|7)	4,000–10,000 /µL
Platelets	2.90 lakhs/mm³	1.5–4.1 lakhs/µL
Hematocrit	39.2%	35–44.9%
MCV	87.1 fL	78.2–97.9 fL
Total Bilirubin	0.56 mg/dL	0.22-1.2 mg/dL
Direct / Indirect Bilirubin	0.11 / 0.45 mg/dL	<0.5 / 0.1-1 mg/dL

SGPT	13 U/L	7–45 U/L
SGOT	**47 U/L**	8–43 U/L
ALP	124 U/L	35–104 U/L
Serum Na^+ / K^+ / Cl^-	135 / **5.49** / 103 mEq/L	136–145 / 3.5–5.1 / 98–107 mEq/L
D-Dimer	528 ng/mL	<500 ng/mL
HBsAg / HCV / HIV	Negative	Negative
Total Protein / Albumin / Globulin	8.2 / 3.8 / 4.4 g/dL	6.4–8.3 / 3.5–5.2 / 2.3–3.5 g/dL
Urea / Creatinine	27 / 0.68 mg/dL	17–49 / 0.6–1.2 mg/dL
PT / INR	11 / 0.91	10.2–14.07 sec / 0.85–1.15
aPTT	28.4 (control = 29.75 sec)	24.21–35.29 sec
Serum Homocysteine	**33.33 µmol/L**	5–15 µmol/L
ESR	**55 mm/hr**	0–20 mm/hr
Vitamin D	26.8 ng/mL	20–50 ng/mL
Fasting Lipid Profile - Total Cholesterol - Triglycerides - VLDL - LDL - HDL	 99 mg/dL 82 mg/dL 16 mg/dL 48 mg/dL **30** mg/dL	 < 200 mg/dL < 150 mg/dL < 30 mg/dL < 100 mg/dL > 50 mg/dL
Urine Routine Microscopy	pH-7.5; Protein-Trace; RBCs: 4–5; Pus cells: 4-5	—
ANA Blot	**Ro-52 (weak positive); AMA-M2 (weak positive)**	Negative
ANA IF	Negative	Negative

Radiological Investigations

Table 2 — Radiological Investigations

Modality	**Findings**
CT Right Upper Limb Angiography	Right subclavian artery shows a well-defined hypodense filling defect of approximately 19 × 7 × 6 mm (Length × Thickness × CC), about 7 mm distal to its origin — **suggestive of thrombus**. [Figure 2] Rest of right upper limb arterial system appears normal.
USG Abdomen & Pelvis	Hepatomegaly; Grade 1 fatty liver
2D Echocardiography	Mild concentric LVH; No RWMA; Normal LV size and systolic function; LVEF = 60%; Diastolic function — Normal; Trivial TR; No pulmonary hypertension; IAS, IVS intact; No clot/vegetation/effusion
Bilateral Lower Limb Arterio-Venous doppler	Normal arterial study; No evidence of superficial or deep venous thrombosis

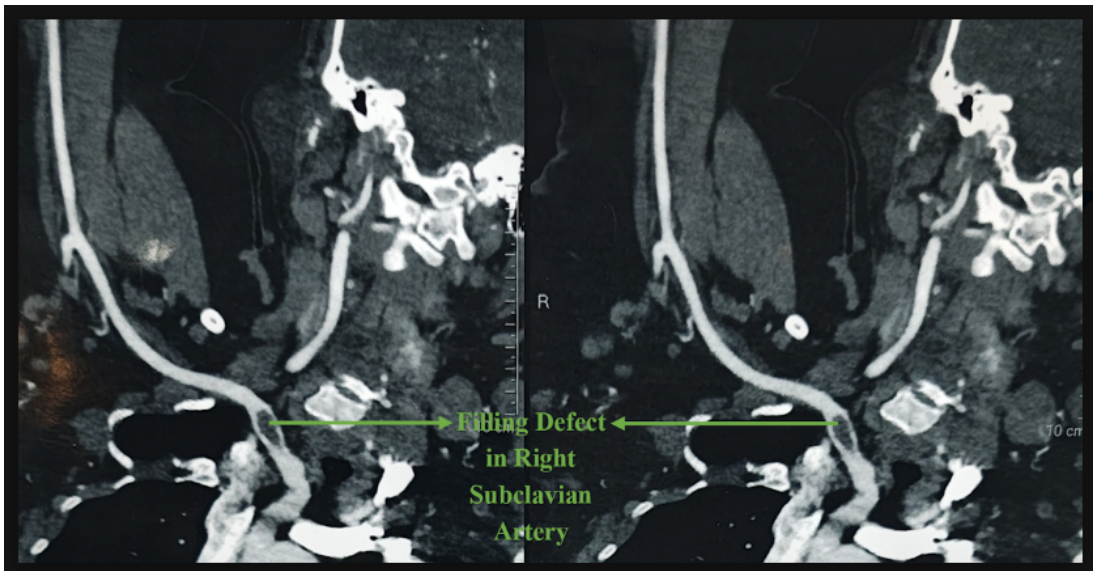


Figure 2: Right subclavian artery showing a large well-defined hypodense filling defect - ?**Thrombus**.

Final Diagnosis

Right ring finger ischemia (digital claudication) secondary to right subclavian artery thrombus, in a known case of hypertension.

Vascular Surgery Advice

Inj. Heparin 5000 U IV stat, followed by Inj. Heparin 18 IU/kg/hour infusion (with aPTT monitoring 6-hourly). On review, 2 days later: heparin infusion stopped; tablet Aspirin/Atorvastatin 75/10 mg lifelong; tablet Rivaroxaban 15 mg BD × 1 month; tablet Cilostazol 50 mg BD × 1 month. Follow-up after 1 month advised.

Treatment Given in Hospital

IV antibiotics were started for the patient.

Anticoagulation / Antithrombotic:

- Inj. Unfractionated Heparin (UFH) 500 IU iv stat, followed by
- Inj. Unfractionated Heparin (UFH) 25,000 IU in 50 mL NS at 2 mL/hr over 36 hours, followed by
- Tab. Rivaroxaban 15 mg PO twice daily
- Tab. Cilostazol 50 mg PO twice daily
- Tab. Aspirin/Atorvastatin 75/10 mg PO once at night

Homocysteine / Nutritional:

- Tab. Homocheck (Vit B12, B9, B6) 1 tab PO once daily

Antihypertensive:

- Tab. Nifedipine extended release 30 mg PO once daily
- Tab. Furosemide/Aldactone 20/50 mg PO once daily

FOLLOW UP

Over 6 months of regular follow-up, the patient showed complete clinical resolution of the bluish discoloration over right ring and middle fingers [Image 3], and the most recent CT angiography demonstrated complete resolution of the subclavian artery thrombus. However, owing to occasional mild claudication still persistent in the right ring finger, as per vascular surgery advice, patient has been advised to continue tablet rivaroxaban 20mg OD, cilostazol 100mg BD and aspirin-atorvastatin 75/20mg HS and advised to follow up after a month. Below is an image of the right hand of the patient upon follow up, showing complete resolution, with no evidence of digital gangrene. [Figure 3]



Figure 3: Complete resolution of bluish discoloration over the right ring and middle finger, over 6 months-follow up, with no evidence of gangrene.

DISCUSSION

This report presents an unusual and diagnostically challenging case, a middle-aged hypertensive female who developed digital ischemia following a minor traumatic wound, with remarkably preserved peripheral pulses. This occurrence of right finger claudication, secondary to a subclavian arterial thrombus, was a diagnostic challenge due to the subtle symptomatology. CT Angiography help

made the diagnosis of right subclavian artery thrombus. The thrombus measuring approximately 19 × 7 × 6 mm, situated only 7 mm distal to the origin of the right subclavian artery, could have been the source of embolic fragments which propagated distally to the digital vasculature, explaining the isolated right ring finger ischemia with preserved pulses. This thus underscores the importance of maintaining a high index of suspicion for proximal arterial thrombosis even in the absence of classic clinical signs of distal pulse loss.

The clinical spectrum of subclavian artery disease varies from hand and arm claudication to cerebral hypoperfusion and distal embolization causing digital ischemia. A thrombus in the subclavian artery can result in a distal embolization to small digital vessels, and manifest as digital claudication or frank ischemia, even in the absence of loss of pulsations in brachial or radial arteries. This is because the network of collaterals around the shoulder and arm can maintain distal pulses even in the setting of significant proximal obstruction. [4] Upper extremity peripheral arterial disease often presents in patients with risk factors such as hypertension, hyperlipidemia, smoking, diabetes mellitus, and inflammatory disorders. In our patient, hypertension and hyperhomocysteinemia were the identified risk factor. The mildly elevated D-dimer (528 ng/mL), elevated ESR (55 mm/hr), and leukocytosis (TLC 11,660 /µL) together pointed towards an active thromboinflammatory process. [5]

CT angiography was the key diagnostic tool in this case, and it can be performed expeditiously to rule out other causes of arterial occlusion and precisely delineate the extent of the lesion. Echocardiography and limb doppler ultrasonography ruled out cardiac sources of embolism (clot or vegetation) and deep venous thrombosis respectively. The absence of lower limb DVT was important in ruling out a paradoxical embolism mechanism, in which thrombus from DVT crosses into the arterial circulation. [6]

The management strategy depends on the severity and nature of the ischemia. In our case, the patient presented with viable but threatened digital ischemia, requiring only a conservative pharmacological management rather than immediate surgical or endovascular intervention. Acute anticoagulation with intravenous unfractionated heparin was initiated promptly, with aPTT monitoring to ensure therapeutic levels. [7] Subsequent transition to rivaroxaban, a direct oral anticoagulant (DOAC) and selective factor Xa inhibitor, was initiated. The COMPASS and VOYAGER PAD trials demonstrated that low-dose rivaroxaban combined with aspirin significantly reduces major adverse cardiac and limb events in patients with peripheral artery disease. [8][9]

Cilostazol, a phosphodiesterase-3 inhibitor, was added for its vasodilatory and antiplatelet properties, improving digital microcirculatory perfusion. The combination of rivaroxaban and cilostazol has demonstrated long-term efficacy in critical limb ischemia. [10] Aspirin/Atorvastatin - dual antiplatelet and statin therapy – addressed any residual atherosclerotic risk. Tablet homocheck (methylcobalamin/folic acid/pyridoxine combination) addressed the elevated homocysteine level (33.33 µmol/L), which is recognized as an independent risk factor for arterial thrombosis.

Clinical Implications

- Subclavian artery thrombosis should be suspected in any case of acute digital ischemia even in the presence of peripheral pulses, since collateral circulations can mask the proximal arterial occlusion.
- CT Angiography should be done promptly in such cases, for timely identification of proximal large-vessel thrombosis even in low suspicion cases, since it can prove vital in preventing distal ischemic necrosis and preserving the limb function.
- Early initiation of anticoagulation is equally essential; rivaroxaban - antiplatelet combination therapy provides an effective non-operative approach in non-limb-threatening ischemia.[15][17]
- Elevated homocysteine is a modifiable thrombotic risk factor, and should be actively corrected with B-vitamin supplementation in all patients with arterial thrombosis.

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