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Isolated Gastrocnemius Vein Thrombosis with Concurrent Superficial Venous Thrombophlebitis Despite Negative D-Dimer and Low Wells Score: A Diagnostic Pitfall in Primary Care

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Abstract **Case Report**

Background: Isolated distal deep vein thrombosis (DVT) in particular gastrocnemius or soleal muscular veins forms a special diagnostic problem because of the subtle symptoms and lack of sensitivity of the usually used tools such as D-dimer and Wells scores. Concomitant SVT increases the risk for progression of thrombus and adds clinical importance to early recognition. However, the general practice or primary care physicians commonly resort to clinical prediction rules or laboratory tests which may not reliably rule out distal DVT. ***Case Presentation:*** A 53-year-old woman with a past history of varicose veins, BMI 35 kg/m², previous SVT and current use of hormone replacement therapy (HRT) was seen at the clinic for local tenderness and lump in the left calf over six weeks. On examination, there was a well localised tender nodule with no swelling or erythema. Laboratory assessment showed a negative D-dimer (<190 µg/L FEU) and the Wells score was –1, indicative of low risk of DVT. However, duplex ultrasonography revealed a non-compressible thrombus in the left gastrocnemius vein, measuring approximately 2 cm from the popliteal junction and a segment of 4 cm SVT within varicose veins. She was managed with apixaban and her symptoms improved. ***Conclusion:*** This case illustrates that isolated gastrocnemius vein thrombosis with associated SVT can develop in the setting of reassuring lab values and low clinical probability scores. Localized calf symptoms that are persistent need to be imaged regardless of what the D-dimer and Wells score say. Direct oral anticoagulants (DOACs) offer safe and convenient treatment for these presentations.

Keywords: Distal deep vein thrombosis, gastrocnemius vein, superficial venous thrombophlebitis, apixaban, D-dimer, Wells score.

INTRODUCTION

Deep vein thrombosis is a common and potentially life-threatening condition, typically involving the proximal deep venous system. In contrast, isolated distal DVT of the calf veins including the gastrocnemius and soleal veins accounts for up to one-third of all DVT cases and often presents with nonspecific or minimal clinical signs [1,2]. Because of their distal location and lower clot burden, muscular vein thromboses may not trigger a sufficient fibrin degradation response to elevate D-dimer levels, reducing the sensitivity of this widely used diagnostic biomarker [1,5].

Similarly, the Wells score validated primarily for proximal DVT may underestimate the probability of distal thrombosis, as its components emphasize systemic or extensive limb findings (e.g., swelling, collateral veins) rather than localized calf symptoms [5]. As a result, distal DVTs may be overlooked in primary care when only clinical prediction rules and D-dimer testing are used.

Superficial venous thrombophlebitis frequently occurs in varicose veins and may coexist with or extend into the deep venous system, particularly in patients with additional risk factors such as obesity, hormone therapy, and prior venous thromboembolism (VTE) [3,4]. When SVT occurs near the deep venous junctions or in patients with high-risk profiles, the probability of propagation increases substantially.

This report describes a diagnostically challenging case of isolated gastrocnemius vein thrombosis with concomitant SVT in a woman with

multiple VTE risk factors, despite a negative D-dimer and a Wells score of –1. The case underscores the importance of clinical judgment and highlights the limitations of diagnostic algorithms in distal venous disease.

CASE PRESENTATION

A 53-year-old woman presented with a 6-week history of localized pain and a palpable lump in her left calf. Her medical history included long-standing bilateral varicose veins, a previous episode of SVT in the left leg 5 years earlier, obesity (BMI 35 kg/m²), and use of hormone replacement therapy (125 mcg estradiol patch twice weekly and 100 mg oral Utrogestan). She denied recent trauma, prolonged immobilization, major surgery, long-distance travel, or malignancy.

Physical Examination

Vital signs were normal, and she was afebrile. Examination of the affected limb revealed a discrete, approximately 4-cm tender mass in the left calf without erythema, edema, or skin changes. Peripheral pulses were intact, and neurological and cardiovascular examinations were unremarkable.

Laboratory Investigations

Blood tests including hemoglobin, white cell count, renal function, liver enzymes, and coagulation profile were within normal limits. The D-dimer was negative (<190 µg/L FEU). Her Wells score was calculated as –1, reflecting low clinical suspicion for DVT.

Imaging

Given the persistence of symptoms and the presence of a localized lump, duplex ultrasonography was performed. It demonstrated:

- A non-compressible thrombus in the left gastrocnemius vein, measuring approximately 2 cm in length and extending toward its junction with the popliteal vein.
- Concurrent superficial venous thrombophlebitis involving a 4-cm thrombus in a varicose vein along the posteromedial calf, approximately 10 cm below the knee crease.

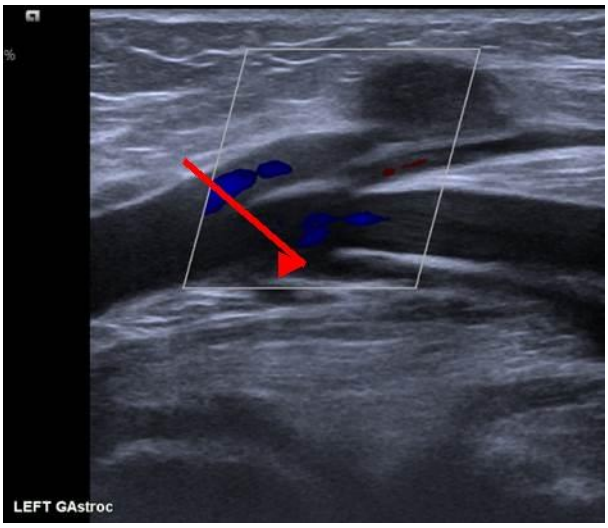

Figure 1: Duplex ultrasound showing a non-compressible thrombus in the gastrocnemius vein

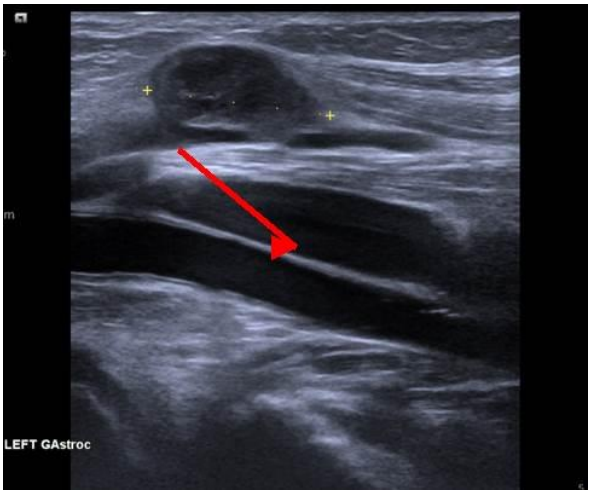

Figure 2: Longitudinal image showing thrombus extension toward the popliteal junction

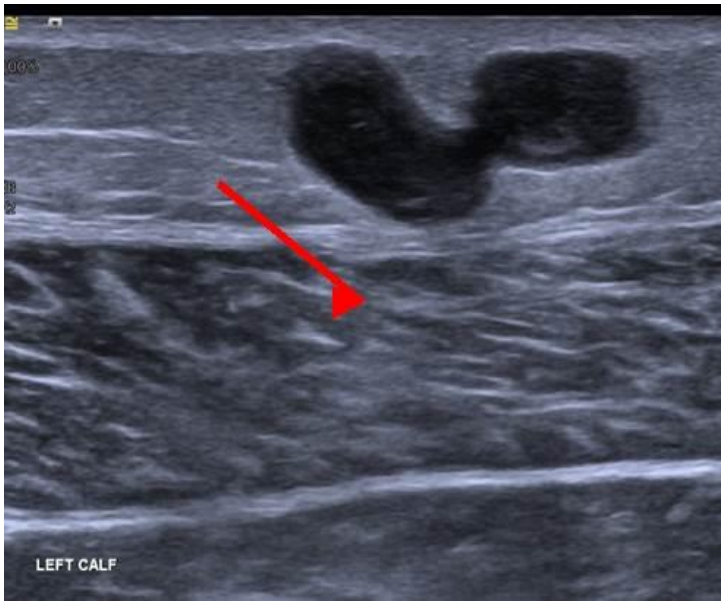

Figure 3: Transverse image showing SVT within a varicose vein

Management and Follow-up

The patient was treated with apixaban and referred to vascular surgery for long-term venous assessment. She reported progressive symptom improvement at follow-up appointments.

Table 1: Summary of Investigations

Category	Investigation	Result	Normal Range	Findings / Comments
Haematology	Prothrombin Time (PT)	10.4 seconds	10–13 seconds	Normal
	INR	1.0	0.9–1.2	Normal
	Activated Partial Thromboplastin Time (APTT)	29.4 seconds	25–35 seconds	Normal
	D-dimer	<190 µg/L FEU	<500 µg/L FEU (negative)	Negative
Biochemistry	Sodium	137 mmol/L	135–145 mmol/L	Normal
	Potassium	4.0 mmol/L	3.5–5.3 mmol/L	Normal
	Urea	4.1 mmol/L	3.5–7.2 mmol/L	Normal
	Creatinine	70 µmol/L	49–90 µmol/L	Normal
	eGFR	86 mL/min/1.73 m²	>60 mL/min/1.73 m²	Normal renal function
	Bilirubin	14 µmol/L	0–21 µmol/L	Normal
	ALT	14 IU/L	10–45 IU/L	Normal
	Alkaline Phosphatase	102 IU/L	30–130 IU/L	Normal
	Albumin	46 g/L	32–50 g/L	Normal
	Calcium (adjusted)	2.42 mmol/L	2.20–2.60 mmol/L	Normal
	Phosphate	1.3 mmol/L	0.8–1.5 mmol/L	Normal
	Urine dipstick	Normal	—	No abnormality detected
Clinical Scoring	Wells score	-1	—	DVT unlikely
Imaging	Duplex ultrasonography	—	—	Non-compressible thrombus in left gastrocnemius vein (~2 cm, no proximal extension). Superficial venous thrombophlebitis in posteromedial calf varicose vein (~4 cm, 10 cm below knee crease).

DISCUSSION

Distal DVT involving the gastrocnemius vein is clinically significant despite traditionally being considered lower risk than proximal DVT. Muscular calf vein thromboses have been shown to propagate proximally in up to 15–20% of cases, particularly in patients with risk factors such as varicose veins, hormone therapy, high BMI, and prior SVT [1–4].

Limitations of D-Dimer and the Wells Score

D-dimer assays have high sensitivity for proximal DVT but significantly lower sensitivity for distal muscular thrombosis [1,2,5]. Distal calf thromboses often involve:

- Smaller clot burdens,
- Lower fibrinolytic turnover, and
- Limited systemic inflammatory response,

All of which may fail to trigger a detectable rise in D-dimer.

The Wells score similarly underperforms in isolated distal DVT because many of its criteria favor more extensive or systemic manifestations of thrombosis. Findings such as limb swelling, prominent collateral veins, or recent immobility are often absent in muscular DVT, reducing its predictive accuracy in this population [5].

This patient's negative D-dimer and Wells score of –1 exemplify the potential for false reassurance.

Coexisting Superficial Thrombophlebitis

SVT frequently affects varicose veins and may coexist with or extend into the deep venous system [3]. Patients with SVT have a significantly increased risk of concurrent DVT or future VTE events, particularly when:

- The thrombosis is extensive or near deep venous junctions,
- The patient has hypercoagulable risk factors,
- Hormone therapy is used, or
- Obesity is present.

In this case, SVT likely contributed both to the clinical symptoms and to the increased risk of propagation, strengthening the argument for anticoagulation.

Management of Isolated Distal DVT

Current evidence supports two management strategies depending on symptom severity and risk:

1. Serial duplex ultrasonography to monitor patients with low-risk isolated distal DVT.
2. Anticoagulation in those with:
   - Significant symptoms,
   - Extensive thrombosis,
   - Involvement near proximal junctions, or
   - Additional risk factors (e.g., HRT, obesity, prior SVT) [1–4].

Direct oral anticoagulants (DOACs), including apixaban, offer an effective and safe alternative to warfarin, with predictable pharmacodynamics and reduced monitoring requirements [4]. In this case, anticoagulation was justified due to thrombus proximity to the popliteal junction, coexisting SVT, and the presence of multiple VTE risk factors.

CONCLUSION

This case highlights the diagnostic challenges of isolated gastrocnemius vein thrombosis, particularly when standard diagnostic tools suggest low probability. A negative D-dimer and low Wells score do not reliably exclude distal DVT. Persistent focal calf symptoms should prompt duplex ultrasonography, especially in patients with varicose veins or other VTE risk factors. DOAC therapy is effective for managing combined distal DVT and SVT. Enhanced clinical vigilance in primary care is crucial to avoid missed or delayed diagnoses.

Learning Points

- Negative D-dimer does not exclude isolated distal DVT.
- Wells score has limited accuracy for muscular vein thrombosis.
- Superficial venous thrombophlebitis in varicose veins increases DVT risk.
- Apixaban and other DOACs offer effective therapy for distal DVT and SVT.
- Persistent localized calf symptoms warrant duplex ultrasonography regardless of clinical risk scores.

Patient Consent

Written informed consent was obtained for publication of this case and accompanying images.

Declarations

Ethics Approval: Not required for single case reports.

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Conflict of Interest: None.

Presentation: None.

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Author Contributions

- **Farid Latif:** Case management, literature review, manuscript drafting.
- **Bushra Farid:** Critical revision, editing, final approval.

Both authors approved the final manuscript.

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