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Recurrent Deep Vein Thrombosis (DVT) with Negative D-Dimer in a Patient on Rivaroxaban: A Diagnostic Pitfall

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Abstract

We present a case of a 60-year-old female with a history of recurrent venous thromboembolism (VTE), who re-presented with right leg pain and was found to have a non-occlusive deep vein thrombosis (DVT) in the common femoral vein (CFV) despite being on rivaroxaban. Notably, the D-dimer was negative, and the Wells score was one. Duplex ultrasound confirmed non-compressibility of the CFV and femoral vein (FV). This case emphasizes the limitation of D-dimer testing in patients on direct oral anticoagulants (DOACs) and the importance of considering imaging even in low pre-test probability cases when clinical suspicion persists.

Keywords

Deep Vein Thrombosis, D-dimer, Direct Oral Anticoagulant, Rivaroxaban, Ultrasound, Diagnostic Algorithm

1. Introduction

D-dimer is widely used to exclude VTE in low-risk patients, especially when combined with pre-test probability tools such as the Wells score [1] [2]. Current international guidelines recommend excluding DVT without imaging when the D-dimer is negative, and the Wells score is low [2] [3]. However, this strategy has not been validated in patients already receiving therapeutic anticoagulation. In such cases, D-dimer levels may be artificially low, leading to false reassurance [4]. This case illustrates a diagnostic challenge in such a context and highlights the need for cautious interpretation of algorithms in anticoagulated patients.

2. Case Presentation

2.1. Patient

A 60-year-old female presented to the Emergency Department (ED) with a 24-hour history of medial right thigh pain radiating to the anterior thigh. The pain had spontaneously improved and she was not using analgesia at the time of review. She denied any recent surgery, trauma, immobilization, travel, or malignancy.

The patient reported taking her last dose of rivaroxaban approximately 6 hours prior to presentation. An anti-Xa level specific to rivaroxaban was not performed due to unavailability in our ED at the time.

2.2. Past Medical History

- Four prior episodes of right lower limb DVT.
- Pulmonary embolism 29 years ago.
- Recent switch from warfarin to rivaroxaban 20 mg daily (3 weeks prior to presentation).

2.3. Examination

- Vitals: Normal.
- No limb swelling.
- Mild tenderness in the right anterior thigh.
- Full range of motion preserved.

2.4. Investigations

- Full blood count and biochemistry unremarkable.
- D-dimer: 0.3 μg/mL (within normal range).
- Wells score: 1 for previous documented DVT.

2.5. Initial Management

Given that the D-dimer was negative and patient's pain was settled and patient was on therapeutic dose of rivaroxaban with a reasonable compliance after discussion with the patient, she was discharged with clear instructions to book an appointment with her GP in 48 hours to review and arrange a Doppler ultrasound if indicated. Pt called her GP to make an appointment which the GP was concerned by the patient's history requested a lower limb ultrasound to be done before departure from ED.

3. Imaging Findings

The ultrasound team noted differences in echogenicity and vein compressibility, distinguishing chronic post-thrombotic changes (seen in the femoral and gastrocnemius veins) from the new thrombus in the CFV. The representative images are shown in **Figure 1** and **Figure 2**. The presence of a newly non-compressible segment with different characteristics supported the diagnosis of an acute non-

occlusive thrombus. The sonographic findings are summarized in Table 1.

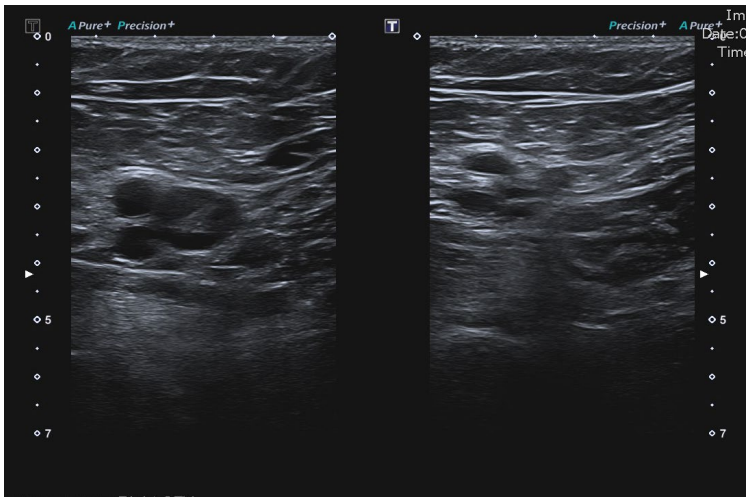

Figure 1. Ultrasound image showing vein compressibility assessment.

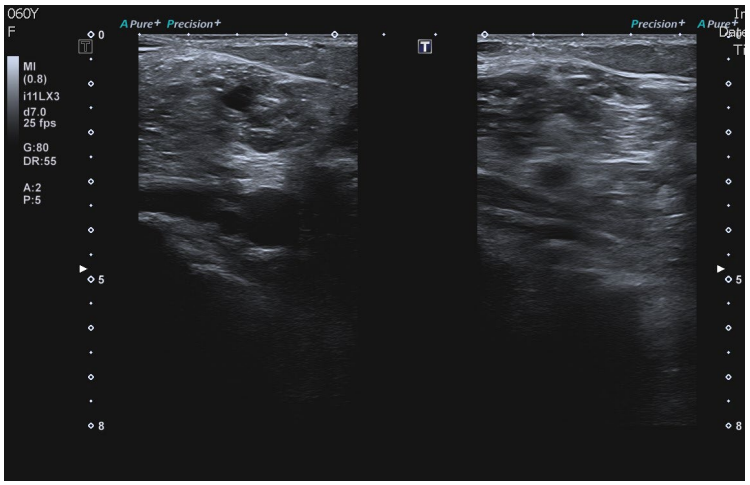

Figure 2. Duplex ultrasound demonstrating venous compressibility and partial thrombus in CFV.

Table 1. Ultrasound vein findings.

Vein	Findings
Common Femoral Vein (CFV)	Non-occlusive DVT, non-compressible
Femoral Vein (FV)	Non-compressible from 10 cm above the knee
Popliteal Vein (POPV)	Compressible, no thrombus
Tibio-Peroneal Trunk	Compressible, normal flow
Posterior Tibial Vein	Patent
Peroneal Vein	Patent
Medial Gastrocnemius Vein	Patent, likely chronic changes

Duplex imaging revealed a non-occlusive thrombus in the right common fem-

oral vein, extending into the femoral vein approximately 10 cm above the knee. The popliteal and calf veins were clear.

In response to these findings, warfarin was initiated alongside the current dose of rivaroxaban. An INR was requested for 48 hours later, with a plan to discontinue rivaroxaban once the INR reached the therapeutic range of 2 to 3, in accordance with clinical guidelines [3].

4. Discussion

This case reveals a diagnostic trap: low Wells score and negative D-dimer provided false reassurance in a patient at high risk for recurrent VTE. DOACs, particularly rivaroxaban, suppress thrombin and fibrin formation, potentially lowering D-dimer levels even in the presence of thrombosis [4].

Multiple studies have shown reduced D-dimer reliability in patients on rivaroxaban. Mohamed *et al.* demonstrated significantly reduced D-dimer levels in patients on rivaroxaban [4]. Wu *et al.* reported poor predictive value of D-dimer post-surgery in patients on rivaroxaban [5].

Our patient's negative D-dimer (0.3 μg/mL) and Wells score of 1 would typically preclude further testing. However, her history of recurrent DVTs and recent medication change warranted a more cautious approach. Clinical judgment prevailed when her GP requested imaging, which confirmed the diagnosis.

This case echoes reports from Alsararatee and Ahmed *et al.*, where VTE was diagnosed despite negative D-dimer while on rivaroxaban [6] [7]. Comparable evidence has been documented in earlier studies [8] [9]. The findings stress the limitations of current algorithms in anticoagulated patients.

5. Conclusions

This case also reminds us that even as senior ED specialists; we often trust guideline-based approaches such as Wells scoring and D-dimer testing. However, relying solely on these tools without considering the clinical context may lead to inappropriate conclusions. Therefore, we strongly advocate for a patient-centered approach that is informed by clinical judgment, individual patient history, and practical experience, especially in complex or high-risk cases.

Clinicians must recognize that D-dimer assays may be falsely negative in patients on rivaroxaban. In those with significant thromboembolic history, persistent symptoms should prompt imaging, even with low pre-test probability. Clinical acumen remains paramount in the assessment of VTE risk in anticoagulated patients.

Acknowledgements

Patient Consent: Written informed consent was obtained from the patient for publication of this case report and accompanying images.

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Conflicts of Interest

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

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