

# Navigating a Prothrombotic Storm

## Risk Stratification of a Saddle Pulmonary Embolism associated with Ulcerative Colitis & Janus Kinase Inhibition

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### Purpose

Effective risk stratification should balance all inputs – no single parameter should disproportionately influence clinical decision-making.

#### Background

Intermediate-risk pulmonary embolism [PE]  
• Significant diagnostic and therapeutic challenge (1).

Guidelines & recent studies emphasize the importance of right ventricular [RV] assessment in risk stratification for acute PE (1,2).

Risk Category	Hemodynamic Instability	PESI Class III–V or sPESI ≥1	RV Dysfunction (TTE/CTPA)	Elevated Troponin
High Risk	+	(+)	+	(+)
Intermediate–High	–	+	+	+
Intermediate–Low	–	+	One (or none) positive	One (or none) positive
Low Risk	–	–	–	–

The ratio of tricuspid annular plane systolic excursion [TAPSE] to pulmonary artery systolic pressure [PASP] has emerged as a promising surrogate marker for RV–pulmonary artery [PA] coupling (2,3).

However, real-world application and prognostic utility of TAPSE/PASP in intermediate-risk PE remain limited (4,5).

#### References

- Konstantinides SV, Meyer G, Becattini C, Bueno H, Geersing GJ, Harjola VP, et al. 2019 ESC Guidelines for the diagnosis and management of acute pulmonary embolism. *Eur Heart J*. 2020;41(4):543–603. doi:10.1093/eurheartj/ehz405
- Guazzi M, Bandera F, Pelissiero G, Castelvécchio S, Menicanti L, Ghio S. Tricuspid annular plane systolic excursion/pulmonary arterial systolic pressure ratio: a new measure of right ventricular function and its prognostic value in heart failure. *Eur J Heart Fail*. 2013;15(6):608–617. doi:10.1093/eurjhf/hft015
- Douschan P, Kovacs G, Avian A, Foris V, Gruber L, Olschewski A, et al. TAPSE/PASP ratio predicts severity and prognosis in patients with pulmonary embolism. *Eur Respir J*. 2020;55(5):1900979. doi:10.1183/13993003.00979-2019
- Lyhne MD, Kabrhel C, Giordano N, Andersen A, Nielsen-Kudsk JE, Zheng H, et al. The echocardiographic ratio tricuspid annular plane systolic excursion/pulmonary arterial systolic pressure predicts short-term adverse outcomes in acute pulmonary embolism. *Eur Heart J Cardiovasc Imaging*. 2021;22(3):285–294. doi:10.1093/ehjci/jeaa243
- Yuriditsky E, Zhang RS, Zhang P, Postelnicu R, Greco AA, Horowitz JM, et al. Right ventricular–pulmonary arterial uncoupling as a predictor of invasive hemodynamics and normotensive shock in acute pulmonary embolism. *Am J Cardiol*. 2025;236:1–7.
- Barco S, Schmidtmann I, Ageno W, Bauersachs R, Becattini C, Bounameaux H, et al. Assessment of risk of recurrent venous thromboembolism in patients with pulmonary embolism: a systematic review and meta-analysis. *Eur Heart J*. 2022;43(5):427–444. doi:10.1093/eurheartj/ehab534
- US Food and Drug Administration. FDA approves boxed warning about increased risk of blood clots and death with higher dose of arthritis and ulcerative colitis medicine tofacitinib (Xeljanz, Xeljanz XR) [Internet]. Silver Spring (MD): FDA; 2019 Jul 26 [cited 2025 Apr 28]. Available from: <https://www.fda.gov/drugs/drug-safety-and-availability/fda-approves-boxed-warning-about-increased-risk-blood-clots-and-death-higher-dose-arthritis-and>
- US Food and Drug Administration. FDA requires warnings about increased risk of serious heart-related events, cancer, blood clots, and death for JAK inhibitors that treat certain chronic inflammatory conditions [Internet]. Silver Spring (MD): FDA; 2021 Sep 1 [cited 2025 Apr 28]. Available from: <https://www.fda.gov/drugs/drug-safety-and-availability/fda-requires-warnings-about-increased-risk-serious-heart-related-events-cancer-blood-clots-and-death>
- Mehta P, Lopes L, Abreu MT. Tofacitinib and risk of thrombosis in ulcerative colitis: a systematic review and meta-analysis. *Clin Gastroenterol Hepatol*. 2022;20(8):1780–1790.e3. doi:10.1016/j.cgh.2021.12.023

#### Case Presentation

70-year-old M with a PMHx of ulcerative colitis [UC] on tofacitinib for four years presented with generalized weakness and progressive exertional dyspnea.  
• 4-week history of intermittent blood-streaked diarrhea with up to 10–12 bowel movements daily.

**Vitals** on presentation were remarkable for atrial fibrillation with a rapid ventricular response.

**Laboratory** findings were notable for:

- Elevated troponin [88 ng/L]
- Elevated D-dimer [7061 ng/mL],
- Elevated proBNP [11,917 pg/mL]

**Diagnostic Imaging:**

- CTA Chest - saddle PE with signs of RV strain
- Lower extremity Doppler ultrasound - acute deep vein thromboses in the left popliteal and tibial veins and the right tibial vein
- Echocardiogram - global left ventricular hypokinesis [EF 30–39%], a dilated right ventricle with moderately reduced systolic function, TAPSE of 18 mm, and estimated PASP of 39 mmHg—yielding a TAPSE/PASP ratio of 0.46.

**Risk stratification scores:**

- Well’s score of 7.5 (DVT signs, HR, suspicion)
- PESI score of 100 (age, sex, HR)
- sPESI score 1 (HR)
- ESC classification of intermediate–high-risk PE

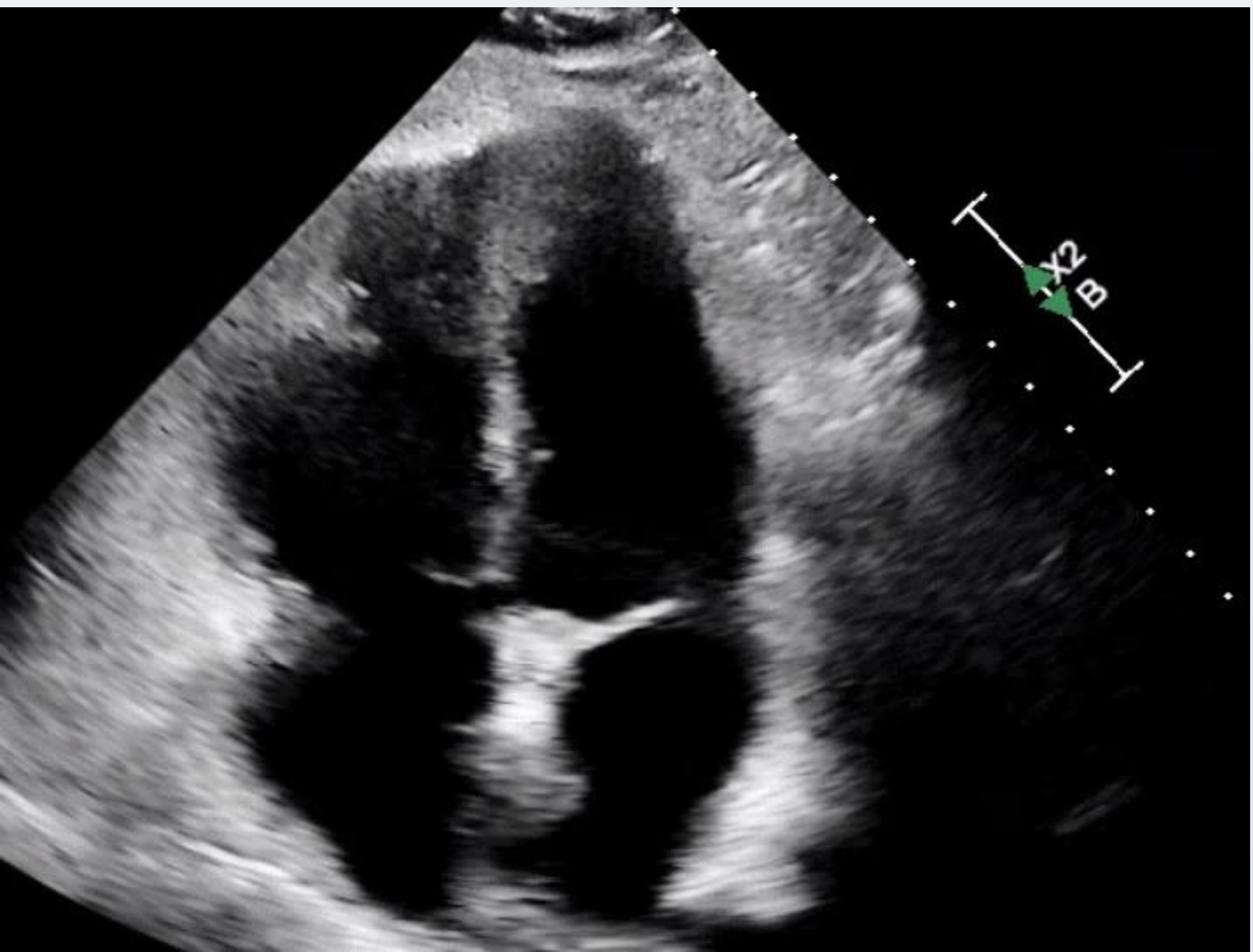
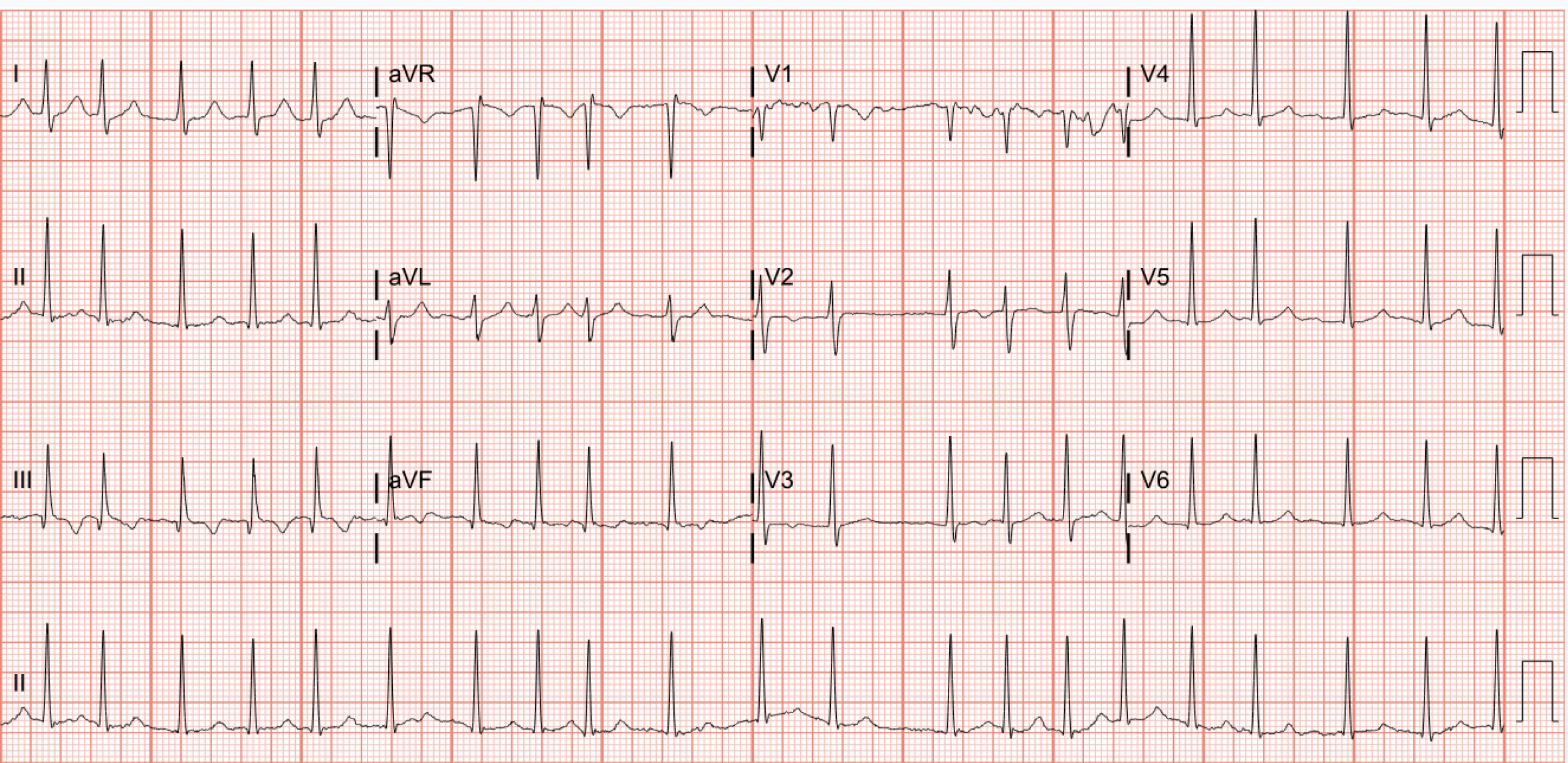
**Management:**

- IV Heparin and transferred from MSDU to ICU for monitoring
- Within 24 hours, successful mechanical thrombectomy was performed.
- A-fib, underwent DC Cardioversion
- The UC flare was managed with IV methylprednisolone, followed by an oral taper.

**Long-term Management**

- Due to the extensive clot burden, active colitis, and chronic tofacitinib/Biologic use, lifelong anticoagulation with apixaban was recommended

#### Diagnostic Imaging



Scan for CTA Chest & TTE

#### Discussion

**Prothrombotic Storm**

- Patients with UC have a well-documented increased risk of venous thromboembolism, which is further amplified by systemic inflammation in an acute flare and pharmacologic agents like Janus kinase inhibitors (6–8).
- Tofacitinib carries an FDA boxed warning due to increased risks of thrombosis, cardiovascular events, and malignancy (6,7).
  - A recent meta-analysis further supports the elevated thrombotic risk in UC patients treated with tofacitinib, especially at higher doses (9).

**TTE and Emerging Surrogate Markers of RV-PA Coupling**

- A TAPSE/PASP ratio <0.36–0.40 has been associated with increased mortality and adverse outcomes in patients with acute PE (3–5).

**Why does this case matter?**

- Although our patient had a ratio of 0.46, elevated biomarkers, clot burden, and proinflammatory state prompted early intervention.
- This case highlights the importance of early identification of thrombotic risk factors and comprehensive risk stratification at the time of admission, incorporating clinical, biochemical, and imaging findings.