



Venous Thromboembolism After Large Joint Arthroplasty, Factoring COVID-19 into Perioperative Risk Estimation and Management

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INTRODUCTION:

- Lower extremity total joint arthroplasty (THA) carries significant risk of perioperative venous thromboembolism (VTE)
- COVID-19 independently imparts elevated risk for VTE during acute infection and in the perioperative setting for patients undergoing elective surgery^{1,2}
- Increased perioperative risk for VTE persists for weeks after COVID-19, and even longer in patients with persistent symptoms¹
- Different strategies for chemoprophylaxis have been employed to prevent VTE during the perioperative period in patients undergoing lower extremity THA

CASE PRESENTATION:

A 46-years-old woman with end-stage degenerative joint disease of right hip underwent total hip arthroplasty 7 months after a symptomatic COVID infection. She had a history of end-stage left hip osteoarthritis for which she underwent left THA one year prior, HTN, and a prior provoked deep vein thrombosis 12 years prior in the setting of a vascular surgery. Post-operatively, she was prescribed aspirin 81mg twice daily for VTE prophylaxis.

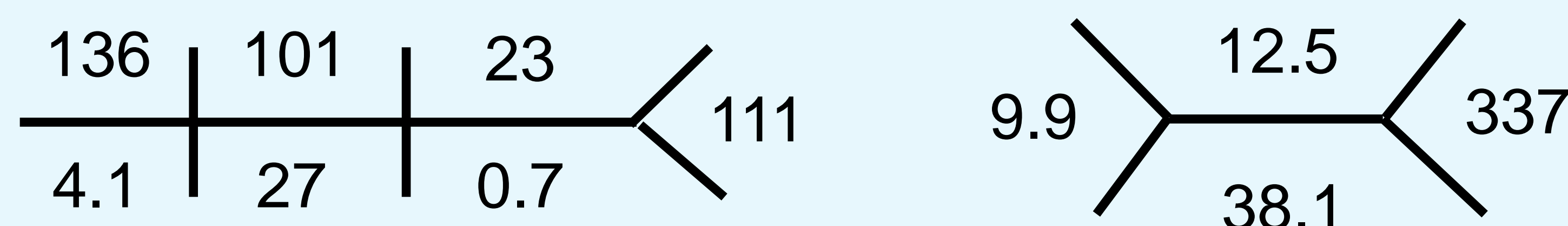
On postoperative day 16, she presented to the emergency department with chest pain and shortness of breath.

Vitals: 98.2F, HR 122 bpm, BP 140/65 mmHg, SpO2 97% on room air

Exam: Normal other than tachycardia on auscultation

EKG: Sinus tachycardia with normal axis, no ST segment changes

Labs:



D-dimer 15.42 mg/L

Troponin-I 0.57 ng/mL → 1.15 ng/mL

CXR – No acute cardiopulmonary disease

CTA Chest – Large saddle embolus in the main pulmonary artery extending to the distal right main pulmonary artery, interlobar artery, and multiple segmental arteries. There was embolus involving the left interlobar and segmental arteries. The right atrium and ventricle were significantly dilated with displacement of the interventricular septum.

CASE RESOLUTION:

- Diagnosis is submassive saddle pulmonary embolism
- She was started on a therapeutic heparin drip
- She remained hemodynamically stable, but given signs of right heart strain, she underwent catheter thrombectomy
- The procedure was tolerated well and she was later transitioned from IV heparin to oral apixaban and discharged home
- Referred to Hematology given her history of two episodes of provoked pulmonary embolism and underwent workup for hypercoagulability disorders, which was unrevealing
- She planned to continue anticoagulation with apixaban for 6 months, followed by a reduced dose indefinitely

DISCUSSION:

- COVID-19 produces a hypercoagulable state that has been associated with VTE, endothelial injury, arterial thrombosis, among other vascular complications
- Incidence of VTE for patients with symptomatic COVID ranges between 9 and 21% in hospitalized patients and 21-31% in patients admitted to an ICU¹
- In the perioperative setting, there is increased risk for VTE lasting weeks following COVID-19¹
- Total joint arthroplasty carries well-established risk for VTE
- CHEST guidelines (most recently updated in 2012) recommend LMWH, when able, for no less than 10-14 days and up to 35 days post-operatively over other options for patients undergoing lower extremity joint arthroplasty³
- Low-dose Aspirin has gained popularity, as studies suggest similar rates of VTE compared to anticoagulants, with better safety profile and tolerability⁴
- A recently published RCT demonstrated that twice daily LMWH significantly reduced VTE relative to twice daily low-dose aspirin in patients undergoing lower extremity total joint arthroplasty⁵
- Optimal strategy for pharmacologic VTE prophylaxis after total joint arthroplasty remains under investigation. How COVID-19 influences these perioperative outcomes should be studied further to determine optimal prophylaxis strategy for patients recovered from COVID-19 undergoing THA

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