

CLINICAL VIGNETTE

“Lifting” the Clot Burden

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Introduction

Paget-Schroetter syndrome is a form of upper extremity deep venous thrombosis (UEDVT) commonly associated with the axillary and subclavian veins. It is related to vigorous activity of the arms, and is thus also referred to as “effort-induced thrombosis.” This disease can occur randomly or secondary to anatomic abnormalities at the thoracic outlet. It usually presents in young, healthy males in their early thirties who participate in strenuous activities involving repetitive overhead arm movements, especially extreme abduction. Examples include weight lifting, rowing, and baseball pitching.^{1,2} It is estimated to be the cause of 40% of primary UEDVT in the absence of risk factors such as a central venous catheter, pacemaker, port, or known or occult malignancy.³

Case

A healthy 56-year-old male presented to the emergency department with right arm pain and swelling for one day. He was physically very active as a regular weight lifter with a consistent, unchanged workout regimen. He had travelled 1 hour by plane one week prior to presentation, denied any trauma or prior surgeries, had no smoking history, and had no personal or family history of DVT. He had a screening colonoscopy at the age of 50, which was normal. Review of systems was otherwise negative.

Vital signs were normal. Physical exam was significant for right upper extremity edema extending distally to the fingers. Right radial and ulnar pulses were intact, and there was no upper extremity cyanosis, numbness, or compromise of motor function. Labs were significant for an elevated D-dimer of >10,000 but were otherwise unremarkable.

A right upper extremity ultrasound showed an acute, occlusive DVT within the right subclavian and axillary veins. The patient was admitted for further work-up and management. He was started on a heparin drip for anticoagulation pending thrombolysis due to significant right upper extremity edema. Following successful thrombolysis, he had a catheter at the thrombus site with tPA running for 24 hours with significant improvement in edema. Follow-up venogram 24 hours later demonstrated a widely patent right axillary vein and subclavian vein stenosis. He was discharged on rivaroxaban for 3 months with plans for right first rib resection for thoracic outlet decompression.

Discussion

UEDVT should be confirmed with ultrasound. Even though pulmonary embolism (PE) is usually associated with lower extremity DVT, the diagnosis of Paget-Schroetter syndrome should be considered for young patients presenting with UEDVT or PE without lower extremity symptoms. A D-dimer of >500 µg/L is sensitive for thrombosis and has a high negative predictive value, but it is not specific for the location of the thrombosis and will not exclude other causes such as vein compression or stenosis.⁴

The goal of treatment is to relieve symptoms from venous obstruction, as well as to prevent complications and future episodes. Treatment options include anticoagulation, thrombolysis, and surgical decompression of the thoracic outlet. Recommendations are based on studies with a focus on lower extremity DVT as there have been no specific studies for UEDVT.¹

All patients with UEDVT should be on anticoagulation for a minimum of three months regardless of whether an intervention was performed.⁵ Most patients with acute and severe symptoms will need inpatient admission for symptomatic management, evaluation for thrombolytic therapy, and possible surgical decompression. Patients with minimal symptoms and presentation longer than two weeks after symptom onset may be managed as outpatients.

A multidisciplinary approach with thrombolysis, anticoagulation, and transaxillary first rib resection can restore venous patency and function. The goal of thrombolysis is to quickly minimize clot burden and decrease associated edema and discomfort. Thrombolysis is successful in 62% to 84% of the cases, with close to 100% success if performed within a few days of symptom onset. Conservative management with anticoagulation alone is often not enough and results in residual deficits. Patients with axillary and subclavian UEDVT should be evaluated for surgical decompression of the thoracic outlet since this decreases the risk of recurrence.¹

Conclusion

It is important to recognize UEDVT in an active, healthy, young patient as a cause of sudden swelling and pain in the upper extremities. Prompt treatment with anticoagulation and thrombolysis if the patient is having moderate to severe symptoms can reduce the thrombus burden and result in a

quicker return to function. After thrombolysis, patients should be evaluated for surgical decompression of the thoracic outlet to prevent future episodes.

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