

The Perfect Storm

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Introduction:

Thromboembolism through an underlying patent foramen ovale (PFO) causing cerebrovascular accidents are well documented in literature ⁽¹⁾. ST elevation myocardial infarction (STEMI) by deep venous thrombus (DVT) is almost exclusively a diagnosis of exclusion with identified venous thrombus, lack of arterial emboli, and communication between arterial and venous systems being criteria to make diagnosis ⁽³⁻⁴⁾.

Case Report:

A 62-year-old white female with diabetes mellitus, hypertension, and end stage renal disease on hemodialysis (HD) presented to the hospital for a planned right upper extremity (RUE) arteriovenous (AV) graft thrombectomy. During the procedure the patient developed nausea, hypotension, dyspnea, and hypercapnic respiratory failure. A 12-lead electrocardiogram showed ST segment elevation in anterior precordial leads. Emergent coronary angiography revealed occlusion of the left anterior descending (LAD) artery in the mid portion. After multiple attempts of balloon angioplasty and thrombectomy we were able to re-establish thrombolysis in myocardial infarction (TIMI) grade 3 flow to mid and distal portions, but unable to get flow to the apical portion of the LAD. Post intervention echocardiogram demonstrated mild reduction in the left ventricular systolic function with an ejection fraction of 40% and apical akinesis. Agitated saline contrast injection showed evidence of right to left shunt suggestive of patent foramen ovale. An upper extremity venous doppler confirmed acute, non-occlusive DVT in right axillary, right proximal brachial, and left internal jugular veins which were treated with anticoagulation with heparin bridge to warfarin for target international normalized ratio of 2-3. After having a tunneled femoral HD catheter placed she was discharged on optimal medical therapy without further complications.

Discussion:

Here a unique case of venous thrombus causing a STEMI is presented. During the thrombectomy of the patient's AV graft, it appears a thrombus was embolized traveling from venous system into the right atrium, across the PFO, into the systemic circulation, and eventually lodged into the LAD. While STEMIs caused by a venous thrombus are extremely rare⁽⁴⁾, the patient had angiographically mild coronary artery disease, a single large LAD thrombosis, high venous clot burden, and STEMI occurring during thrombectomy. It was concluded that the STEMI was from venous thrombosis instead of a ruptured arterial plaque. As approximately 25% of the population have a PFO ⁽¹⁻²⁾ and there is an increasing number of patients undergoing intervention for venous thrombus, clinicians should be aware of this as a potential cause of thromboembolic events given that delays in recognition can lead to significant morbidity and mortality.

References:

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Clinical Vignette