Management of Bilateral Sub-massive PE in a 71 Year-Old Female with Concomitant Acute Intracranial Hemorrhage.

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The Patient

71 y/o F with past medical history of hypertension who presented for evaluation of syncope. She had progressive dyspnea with exertion and fatigue for the last five months that profoundly worsened within the last several weeks, limiting her to walking very short distances. On the morning of admission, she had an episode of syncope after walking a short distance, hitting her head on the garage floor. In the emergency department she complained of headache, nausea, and photophobia. No prior cardiac or VTE history. She had recent out-of-state travel via car on multiple occasions. Physical exam was significant for right parietal hematoma and trace BLE edema. She was scheduled for her first cardiology appointment that afternoon after transthoracic echocardiogram (TTE) two days prior showed low-normal left ventricular (LV) ejection fraction, McConnell's sign, and severely dilated right ventricle (RV).

The Diagnosis

At admission initial troponin-I was 0.09 µg/ml and EKG had 51O3T3 pattern. Chest CT angiography showed RV/LV ratio 1.5, RV strain, and large central pulmonary emboli (PE) in distal right and left main pulmonary arteries. Lower extremity doppler ultrasound revealed no evidence of DVT. Given her syncope episode with fall, a head CT was performed showing 5mm right lateral subdural hematoma (SDH) and small volume local subarachnoid hemorrhage (SAH) in right parietal region.

The Dilemma

Neurosurgery was consulted and recommended conservative management and no anticoagulation or antiplatelet therapy for at least 7 days. In patients with both a need for anticoagulation and contraindication to anticoagulation in the setting of symptomatic PE and acute intracranial hemorrhage (ICH), clinical judgement must be used in the absence of strong evidence-based guidelines. Case reports have demonstrated good outcomes with a variety of management strategies including heparin anticoagulation (1-4), vena cava filter (5), and surgical embolectomy with and without cardiopulmonary bypass (6,7). Newer thrombectomy devices which provide catheter-directed thrombolytics and mechanical thrombectomy offer a non-surgical alternative, which also reduces the use of anticoagulation/antithrombotic medication. Catheter-directed thrombolysis still incurs risk of bleeding even in the setting of no acute ICH (8).

Management

- In consideration of our patient’s ongoing symptoms and acute ICH the decision was made on day of admission to perform selective pulmonary angiogram to assess thrombus burden for possible use of subcutaneous mechanical thrombectomy. This showed thrombi in distal part of right main pulmonary artery (PA), right middle lobe segmental branch, right lower lobe superior segmental branch (image 1), as well as large caliber thrombi in distal left main PA, and thrombus in lingular branch (image 2). During the procedure, excessive clotting was noted in the sheath. Consideration was given to performing mechanical thrombectomy without the use of heparin, however, the risk of embolization was too great.
- The following day repeat CT showed decreasing size of SDH from 5mm to 2mm, and stable SAH.
- Repeat CT 7 days post-presentation showed SDH of 3mm, resolved SAH. She complained of no residual headache, nausea, or photophobia. At this point neurosurgery allowed anticoagulation. Consideration was given to catheter-directed thrombolytics versus catheter-based mechanical thrombectomy. With the history the patient provided, it was difficult to determine the age of the PEs. It was suspected they were a few weeks old and that catheter-directed thrombolytics might not be as successful.
- Right heart cath with Inari was performed 7 days post-presentation. Aspiration x3 with Inari Triever 20 in left pulmonary trunk was unsuccessful (image 3). Catheter was advanced into left pulmonary trunk and nitinol mesh disks advanced in left inferior PA (image 4), aspiration x3 revealed minimal thrombus. Final pulmonary angiography revealed no evidence of acute complications. Mean pulmonary artery pressure was 37 mmHg pre-procedure, down to 33 mmHg post-procedure (image 5). She tolerated the procedure well without complications.
- The difficulty of the procedure indicates that the emboli may have been present longer than initially thought. Her symptoms did improve following the procedure.
- Coagulation panel resulted positive for heterozygous prothrombin gene mutation, she was started on apixaban for long term anticoagulation, and scheduled to follow-up with hematology outpatient.

References: