Massive Risks: Considerations for management of pulmonary embolism with acute stroke

Lauren Lewis MD, Shiv Patel MD, Dominick Roto DO
Division of Pulmonary and Critical Care Medicine
University of Rochester, Rochester NY

BACKGROUND

- Massive pulmonary embolism is defined as sustained hypotension with systolic BP < 90 mmHg for 15 minutes or requiring ionotropic support, pulselessness or sustained heart rate < 40 bpm with signs or symptoms of shock.

- Treatment currently includes maintaining hemodynamic stability and often providing lytic therapy. However, scenarios in which thrombolytic therapy may be contraindicated, such as an acute stroke, lead to a multitude of considerations and poses a challenge in clinical management.

CASE

- A 58-year-old man with no significant past medical history presented to an outside hospital with acute right hemi-paresis and aphasia. His clinical presentation was consistent with acute left MCA occlusion.

- His symptoms improved on arrival with only mild aphasia and right arm weakness noted.

- He was not a candidate for thrombolytic therapy as his last known well was over four hours prior to presentation. In addition to these stroke symptoms and head imaging findings, he was found to be hypoxic and CTA chest was significant for a large saddle PE with right heart strain.

FIGURE 1

Figure 1: CTA chest with saddle PE and large clot burden

Managing massive pulmonary embolism when systemic thrombolytics are contraindicated as in the case of acute stroke can lead to therapeutic challenges

No clear guidelines exist on how to manage both conditions simultaneously. Future dedicated outcomes research may help determine optimal treatment strategies

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MANAGEMENT

- He was started on a high risk bleed protocol heparin drip and transferred to higher level of care for consideration of advanced endovascular therapies.

- His systolic blood pressure intermittently fluctuated in the range of 80-100s with a normal heart rate. He was hypoxic requiring 4-6 liters per minute of supplemental oxygen.

- Pertinent serum blood tests include an elevated NT-proBNP of 3,227, an elevated troponin T of 113, and a normal lactate level. Point-of-care ultrasound showed an enlarged right ventricle with an overriding apex as well as an underfilled and hyperdynamic left ventricle. He was categorized as having a massive pulmonary embolism and intravenous epoprostenol was provided to improve right heart function.

- Of note, at this time, his stroke symptoms had resolved. Doppler ultrasounds of the lower extremities were performed and DVTs in the left distal femoral and popliteal veins were found. After a multidisciplinary discussion with Interventional Radiology, Cardiology, Neurology and Pulmonology, it was decided that the best treatment would be urgent mechanical thrombectomy and IVC filter placement on the same day as presentation.

REFERENCES

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DISCLOSURES

The authors have no disclosures.

FIGURE 2

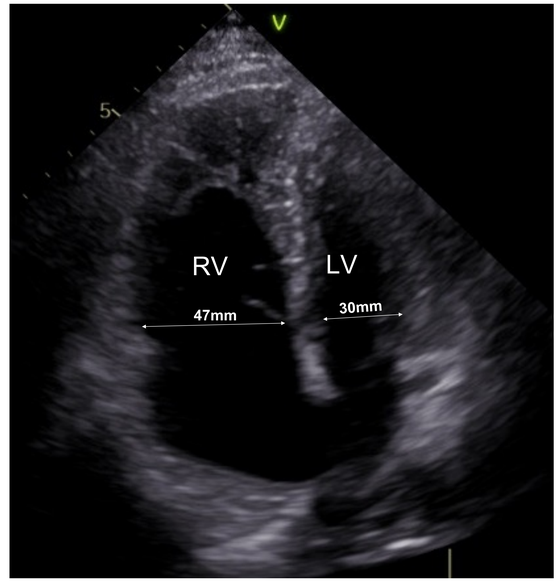

Figure 2: Echo with significant right heart strain, RV to LV diameter ratio > 1.5

CONCLUSIONS

- Here we present a case in which a patient with a stroke was found to have a left middle cerebral artery (MCA) occlusion as well as a large saddle pulmonary embolism (PE) with concomitant patent foramen ovale (PFO) and DVT.

- This case illustrates the challenges of managing a patient with symptomatic PE and acute stroke in whom ongoing embolic events may continue to occur. Currently, no clear guidelines exist on how to manage these two conditions simultaneously, nor do guidelines specify a preferred treatment strategy.

- Options for treatment include catheter-directed thrombolytics, mechanical thrombectomy, or anticoagulation with agents such as IV heparin. This subset of patients requires specialized medical centers capable of mechanical thrombectomy or catheter-directed thrombolytics.

- In addition to PE management, this case is informative in how to manage a PFO post-stroke. A follow up transesophageal echocardiogram (TEE) was performed to further assess the intracardiac shunt which was significant for a PFO with bi-directional shunting. Given the risk of paradoxical embolism (RoPE) score of 7, patient was referred to interventional cardiology for PFO closure. Currently, closure of the PFO is a class IIb recommendation for patients that have a PFO, cryptogenic stroke and DVT.