498/500 words
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Title:
Inferior STEMI and Concomitant Pulmonary Emboli in a Young Patient with Factor II mutation and Pulmonary AVM

Introduction (48 words):
Acute coronary syndrome (ACS) and pulmonary embolism (PE) are life-threatening events with high mortality. They are exceptionally rare in young individuals without traditional risk factors. This case describes a young male who suffered cardiac arrest from concurrent STEMI and submassive PE, successfully managed through rapid diagnosis and intervention.

Case Presentation (253 words):
A 27-year-old male with history of tobacco use disorder and recent gunshot wound to the left leg had been consuming excessive alcohol and energy drinks lately, presented following sudden cardiac arrest while exercising.

EMS found him pulseless, achieving ROSC within one minute of CPR initiation. ECG indicated inferolateral STEMI and angiography revealed 100% thrombotic occlusion of the proximal and distal left posterior descending artery (LPDA) with other arteries appearing healthy. He underwent successful mechanical thrombectomy with resolution of TIMI 3 flow. Intravascular ultrasound did not reveal any obvious site of plaque rupture or erosion suggestive of coronary artery disease. A CT thorax revealed an acute embolus in the segmental pulmonary artery of the left upper lobe and multiple emboli in the subsegmental arteries of the right lower lobe.

Right heart catheterization confirmed cardiogenic shock with right ventricular failure (mean RA 17 mmHg, RVSP 46 mmHg, PCWP 19 mmHg, mPA 37 mmHg, PAPi 0.88). Post revascularization, he was admitted to the ICU, received unfractionated heparin for PE and briefly required vasoactive support with norepinephrine, and epoprostenol infusions. His father later confirmed that his grandmother was diagnosed with a coagulation disorder.

Venous ultrasound revealed a thrombus extending from the left femoral to the popliteal vein. Echocardiography showed LVEF of 50–55%, with bubble study suggesting a possible pulmonary arteriovenous malformation (PAVM) with delayed bubble appearance in the right ventricle. Laboratory testing confirmed heterozygous Factor II mutation.

The patient was discharged a week later in stable condition with clopidogrel, rivaroxaban, and close outpatient cardiology and hematology follow-up.

Discussion (138 words):

Simultaneous STEMI and PE are rare, especially in young adults without significant atherosclerotic risk factors. Such cases are often linked to paradoxical embolism through a PFO or clotting disorders involving both arterial and venous systems. The patients hypercoagulable state - linked to recent left leg gunshot wound, tobacco, alcohol, and energy drinks combined with dehydration from exercising in the setting of factor II mutation - likely led to embolization from left femoral vein causing both PE and STEMI via the suspected PV shunt, or arterial thrombus formation in LPDA.

Prompt diagnosis and intervention are critical. Mechanical thrombectomy successfully restored coronary perfusion in LPDA, while systemic anticoagulation with unfractionated heparin helped treat pulmonary embolism. Upon discharge, the patient was transitioned to oral anticoagulation and monotherapy with a single anti-platelet agent, which will be crucial in preventing recurrent thromboembolic events.

Conclusion (59 words) :

This rare case of STEMI and PE in young adults with PAVM and Factor II deficiency highlights the need to recognize atypical embolic pathways. Further evaluation is needed to confirm the source of right-to-left shunting. Close cardiology and hematology follow-up will be essential to prevent recurrence and guide long-term management, including anticoagulation and potential intervention for the suspected shunt.

References:

1. Alkhalil, M., Cahill, T. J., Boardman, H., & Choudhury, R. P. (2017). Concomitant pulmonary embolism and myocardial infarction due to paradoxical embolism across a patent foramen ovale: a case report. *European heart journal. Case reports*, *1*(2), ytx010. https://doi.org/10.1093/ehjcr/ytx010