

Transcending boundaries: a tale of multiple paradoxical emboli

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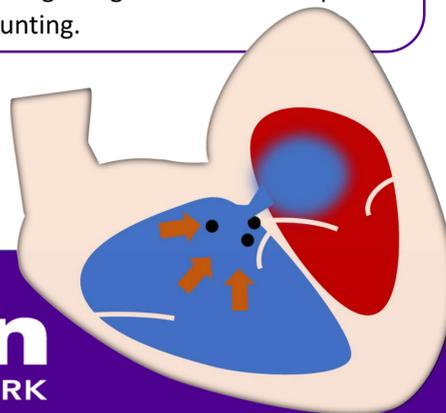
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Introduction

Paradoxical embolism is a well-understood, infrequently encountered yet perhaps under-diagnosed event resulting from intracardiac shunting of thrombus from the venous to the arterial system. Clinical presentation can be variable, and diagnosis requires a high index of suspicion.

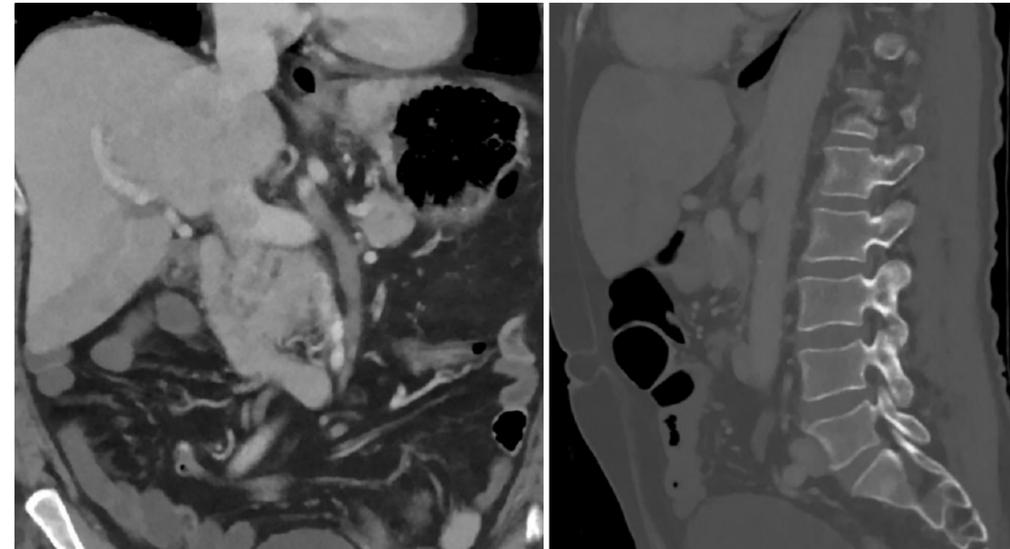
Case Presentation

A 70-year-old male presented with acute onset abdominal pain associated with nausea and vomiting. He denied prior abdominal surgeries or similar episodes. Past medical history was significant for multiple strokes with residual right sided deficits and COPD with chronic hypoxia. On arrival he was afebrile and hemodynamically stable. Physical examination was notable for central abdominal distension and mild tenderness without guarding, and a warm, mildly edematous right lower extremity. Lower extremity ultrasound confirmed a right popliteal vein DVT, and a contrasted CT of the abdomen revealed superior mesenteric arterial occlusion with ischemic colitis and enteritis, left and probable right hepatic arterial occlusion without evidence of hepatic infarction, and bilateral lower lobe pulmonary emboli. Thrombophilia work-up, including JAK-2 mutation analysis, has been negative to date. Prior echocardiogram performed in the context of stroke workup was suggestive of an extracardiac shunt. However, a repeat study which was performed given the current presentation revealed an enlarged right ventricle and patent foramen ovale (PFO) with right to left shunting.



Interventions

The patient was anticoagulated with heparin and underwent urgent exploratory laparotomy for ischemic colitis. The patient was discharged in stable condition after a relatively benign course in the surgical ICU and scheduled for outpatient PFO evaluation, follow up and repair.



Figures 1 & 2 Respectively coronal and sagittal sections of SMA thrombosis

Discussion

This case meets diagnostic criteria of paradoxical embolism (PDE), which may be presumed in the event of DVT, an abnormal communication between the venous and systemic circulatory systems, evidence of systemic embolism, and the presence of a pressure gradient favoring right to left shunting. The case also illustrates the continuum of possible presentations for PDE, which range from vague to dramatic. Furthermore, it highlights the importance of favorable conditions for a right to left shunt helping to facilitate paradoxical emboli. It is possible that on a background of COPD with worsening pulmonary hypertension and right ventricular dilation and hypertrophy, a patent foramen ovale would be accentuated on cardiac imaging, explaining the temporal discrepancy between the echocardiographic findings.

Conclusions

In cases of clinical presentation with concurrent arterial and venous thrombosis, PDE should certainly be high on the list of differentials. However, clinicians should also keep the diagnosis in mind with more subtle presentations, such as isolated ischemic stroke, especially when pulmonary hypertension may co-exist, given the under-appreciated frequency of both PFO¹ and sub-clinical DVT.²

References

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2. Chaikof E, Campbell B, Smith R. Paradoxical embolism and acute arterial occlusion: rare or unsuspected? *Journal of vascular surgery*. 1994 Sep 1994;20(3)doi:10.1016/0741-5214(94)90135-x