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Joseph Moran DO

Lehigh Valley Health Network, Joseph.Moran@lvhn.org

George Prousi MD

Lehigh Valley Health Network, george.prousi@lvhn.org

Ross Biggs DO

Lehigh Valley Health Network, ross.biggs@lvhn.org

Nirupama Kakumanu MD, FCCP

Lehigh Valley Health Network, Nirupama.Kakumanu@lvhn.org

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Massive Hemoptysis in the Setting of Acute Mitral Regurgitation

Joseph Moran, DO,¹ George Prousi, MD,¹ Ross Biggs, DO² and Nirupama Kakumanu, MD³

¹Department of Medicine, ²Division of Cardiology and ³Division of Pulmonary and Critical Care Medicine, Lehigh Valley Health Network, Allentown, PA

INTRODUCTION

- Many pulmonary diseases can be complicated by hemoptysis, including tuberculosis, pneumonia, bronchiectasis, aspergilloma and malignancy.
- Cardiac etiologies are less common and thus, are often not initially considered in the differential diagnosis.
- An uncommon cardiac related cause of massive hemoptysis is acute mitral regurgitation (MR).
- The present case identifies clinical and imaging findings that when present, should prompt suspicion for acute MR as the cause of massive hemoptysis.

CASE PRESENTATION

- A 44 year-old male presented to the ED with shortness of breath and hemoptysis. History was non-contributory and vital signs were normal. A grade 3/6 pansystolic murmur and crackles of the right lower lung field were auscultated.
- Chest radiograph revealed patchy infiltrates predominantly of the right upper and lower lobe. A CT Scan of the chest with intravenous contrast revealed right-sided ground glass opacities and interlobular septal thickening.
- After admission, the patient developed massive hemoptysis and became hemodynamically unstable and hypoxic necessitating transfer to the ICU.
- Bronchoscopy revealed blood in the right main bronchus with therapeutic aspiration and no signs of active bleeding. Infectious studies and cytologies returned negative.
- On hospital day #2, transesophageal echocardiography was completed. The diagnosis was acute, severe, eccentric MR due to a ruptured chordae tendinae (CT) with associated flail P2 segment of the mitral valve.
- The patient underwent mitral valve repair with pathology of valvular tissue revealing significant myxoid degeneration. A post procedure transthoracic echocardiogram showed no MR and the patient had an uncomplicated recovery.

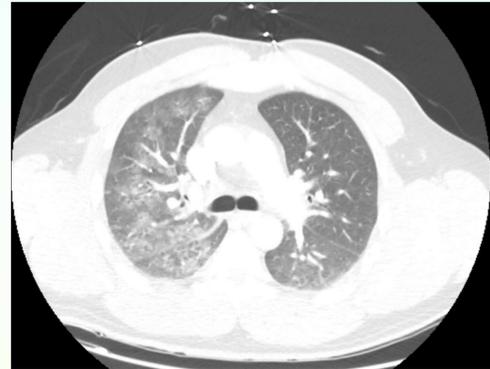


Figure 1: CT scan of the chest with intravenous contrast shows predominantly right sided ground glass opacities and interlobular septal thickening.

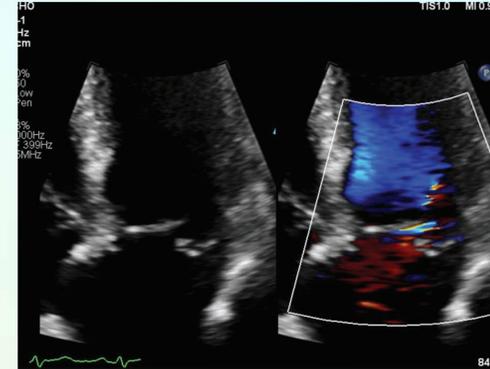


Figure 2: Transthoracic echocardiogram apical four chamber view demonstrating mitral valve posterior leaflet prolapse with associated severe eccentric mitral regurgitation.

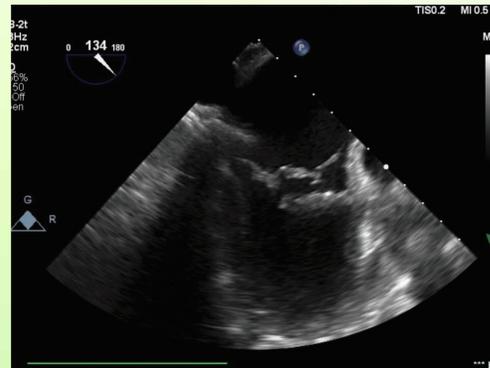


Figure 3: Transesophageal echocardiogram with mid-esophageal long axis view demonstrating mitral valve P2 segment prolapse with flail due to a ruptured chordae tendinae.

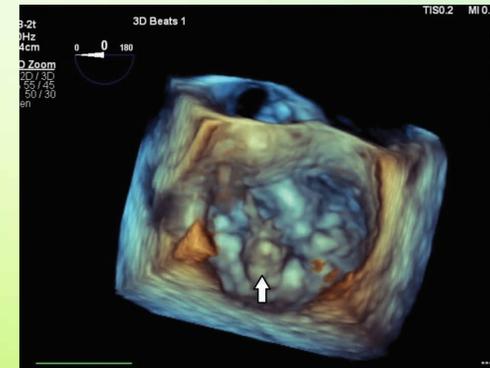


Figure 4: Transesophageal echocardiogram with 3D reconstruction – “Surgeon’s View” – of the mitral valve demonstrating P2 segment prolapse with flail (white arrow) due to a ruptured chordae tendinae.

DISCUSSION

- Comparison of this case with others in literature suggests that our imaging findings of predominant right sided pulmonary edema in the setting of hemoptysis is consistent with acute MR.
- Additionally, the unilateral bleeding seen on bronchoscopy further suggests this etiology and has also been described in case reports.
- The physiologic explanation is thought to be that given the eccentric nature of the MR jet flow and abrupt onset in the setting of ruptured CT, only unilateral pulmonary vein mean capillary pressure is affected. Thus, cardiac causes of hemoptysis result from increased mechanical pressure in capillaries rather than the more typical inflammatory processes.
- In this case, work up for hemoptysis of pulmonary etiology was promptly initiated; however, given the exam and imaging findings, more prompt cardiac evaluation was indicated.

CONCLUSION

- Acute MR is an uncommon cause of massive hemoptysis and non-traumatic cases are exceedingly rare.
- The present case suggests that patients with massive hemoptysis and unilateral pulmonary edema on imaging warrant early cardiac evaluation as acute MR can be a cause of alveolar hemorrhage. Mitral valve repair is the definitive treatment.

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