Unilateral Pulmonary Hemorrhage Caused by Severe Primary Mitral Regurgitation

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Case Presentation

- A 77-year old male with no significant health history presented after 4 day history of hemoptysis:
- Endorsed increasing exercise tolerance, chest tightness, left shoulder pain, and intermittent palpitations. No sick contacts, fever, chills, or night sweats. Lifelong non-smoker.
- Vital signs within normal limits, mild, bilateral leg edema and 3/6 systolic ejection murmur at the apex radiating to the axilla. Cough was productive of low volume, thick, red sputum.
- Abnormal labs: d-dimer 0.84 mg/L, Hgb 12.7 g/dL. All others within normal limits.
- Abnormal chest X-ray correlated with patchy groundglass, consolidative airspace opacities in the posterior peripheral right lung on CT, concerning for pulmonary hemorrhage.
- Initial EKG showed sinus rhythm. Hospital course was complicated by atrial fibrillation with rapid ventricular response that raised clinical dilemma regarding anticoagulation.
- Pulmonary consultants planned for bronchoalveolar lavage; however, the procedure was cancelled in view of transthoracic echocardiography (TTE) findings. TTE revealed an unusual color Doppler jet concerning for primary mitral valve (MV) regurgitation with flail posterior leaflet. Transesophageal echocardiography (TEE) confirmed severe primary MV regurgitation with eccentric anteriorly directed jet and flow reversal in the pulmonary veins from flail posterior middle segment (P2) of the MV and ruptured chordae tendineae, as well as moderate aortic valve stenosis.

- and Neochord placement, aortic valve replacement, and left atrial appendage closure.
- improving right upper lobe airspace disease.



Discussion

Pulmonary Hemorrhage: Numerous pulmonary diseases have been associated with hemoptysis. Hemoptysis is the result of alveolar hemorrhage often due to microvascular inflammation and injury accompanied by pulmonary edema, impaired gas exchange and dyspnea. Bilateral pulmonary hemorrhages are most common. Interestingly, our patient had unilateral pulmonary hemorrhage that is rare; mostly seen in severe MV regurgitation.

Acute Severe Primary MV Regurgitation: Etiologies include flail leaflet, ruptured chordae tendineae or papillary muscle often due to ischemia, infection, or trauma. The eccentric, regurgitant jet creates mechanical pressure on right pulmonary veins resulting in an increase of the right-sided capillary pressure. Despite suboptimal TTE image quality, an ill shaped mitral regurgitant jet prompted TEE that supported the diagnosis.



• The patient had normal coronary angiography; underwent surgical MV repair with #31 Attune ring

Intraoperative TEE showed competent MV apparatus. Postoperative follow up CT scan revealed

Conclusions

- In the setting of alveolar hemorrhage, although cardiac etiologies are rare, they should be included in the differential diagnosis.
- In patients presenting with hemoptysis and unilateral pulmonary edema, acute severe MV regurgitation should be suspected.
- TEE is the imaging of choice for definitive valvular assessment
- The definitive treatment is surgery with MV repair or replacement.

References

Creticus P. Marak, Parijat S. Joy, Pragya Gupta, Yana Bukovskaya, Achuta K. Guddati (2013). Diffuse Alveolar Hemorrhage due to Acute Mitral Valve Regurgitation, Case Reports in Pulmonology.

Izarnotegui, W.V. & Luna, M. (2015). Diffuse alveolar hemorrhage due to severe mitral valve regurgitation. Journal of the American College of Cardiology. Vol. 65., No. 10_Supplement

Saha, B.K., Chong, W.H. Diffuse Alveolar Hemorrhage in Cardiac Diseases. *Lung* 199, 103–112 (2021).

Sakamoto, A. Enomoto, Y., Watabe, H., Koyaman, Y., Matsumoto, Y., Shimojjo,N....Inoue, Y. (2020). Acute mitral valve regurgitation causing severe alveolar hemorrhage. Acute Medicine & Surgery.

Woolley, K. & Stark, P. (1999). Pulmonary parenchymal manifestations of mitral valve disease. Radiographics (19, 4).









