



Baton Rouge General

Internal Medicine Residency Program

# A CASE OF MISDIAGNOSED SEVERE MITRAL VALVE REGURGITATION DUE TO MASQUERADING SYMPTOMS



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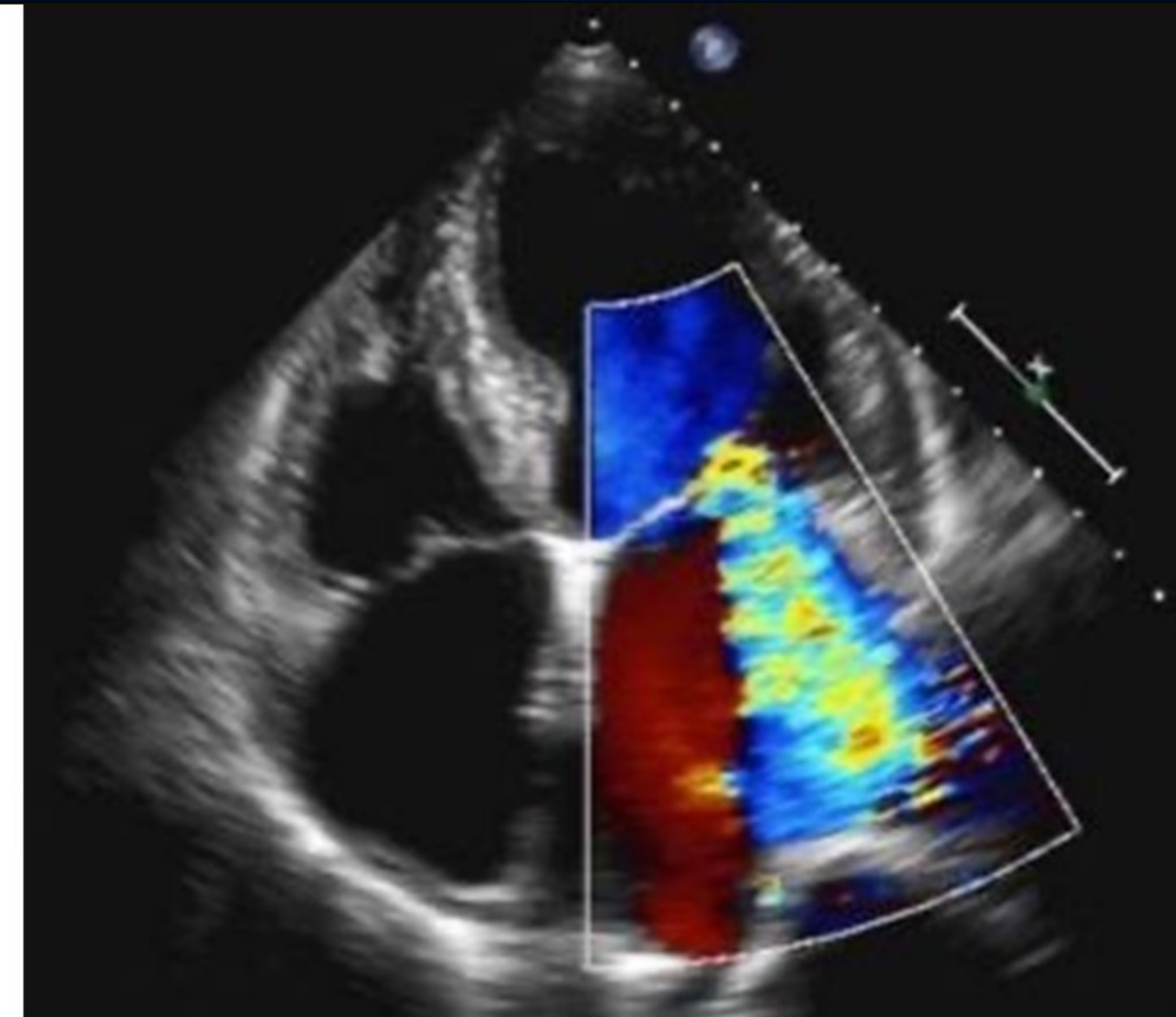
## Introduction

- The symptoms of both acute and chronic mitral valve regurgitation (MR) can be masked by compensatory mechanisms.
- When symptoms of reduced cardiac output and pulmonary congestion become apparent, serious and sometimes irreversible left ventricular dysfunction has occurred.
- Fever and leukocytosis can also accompany the presenting symptoms, further confounding the clinical picture.
- Echocardiography should assess the etiology and severity of MR, however characterizing specific morphological features and grading the severity during can be challenging.

## Case Description

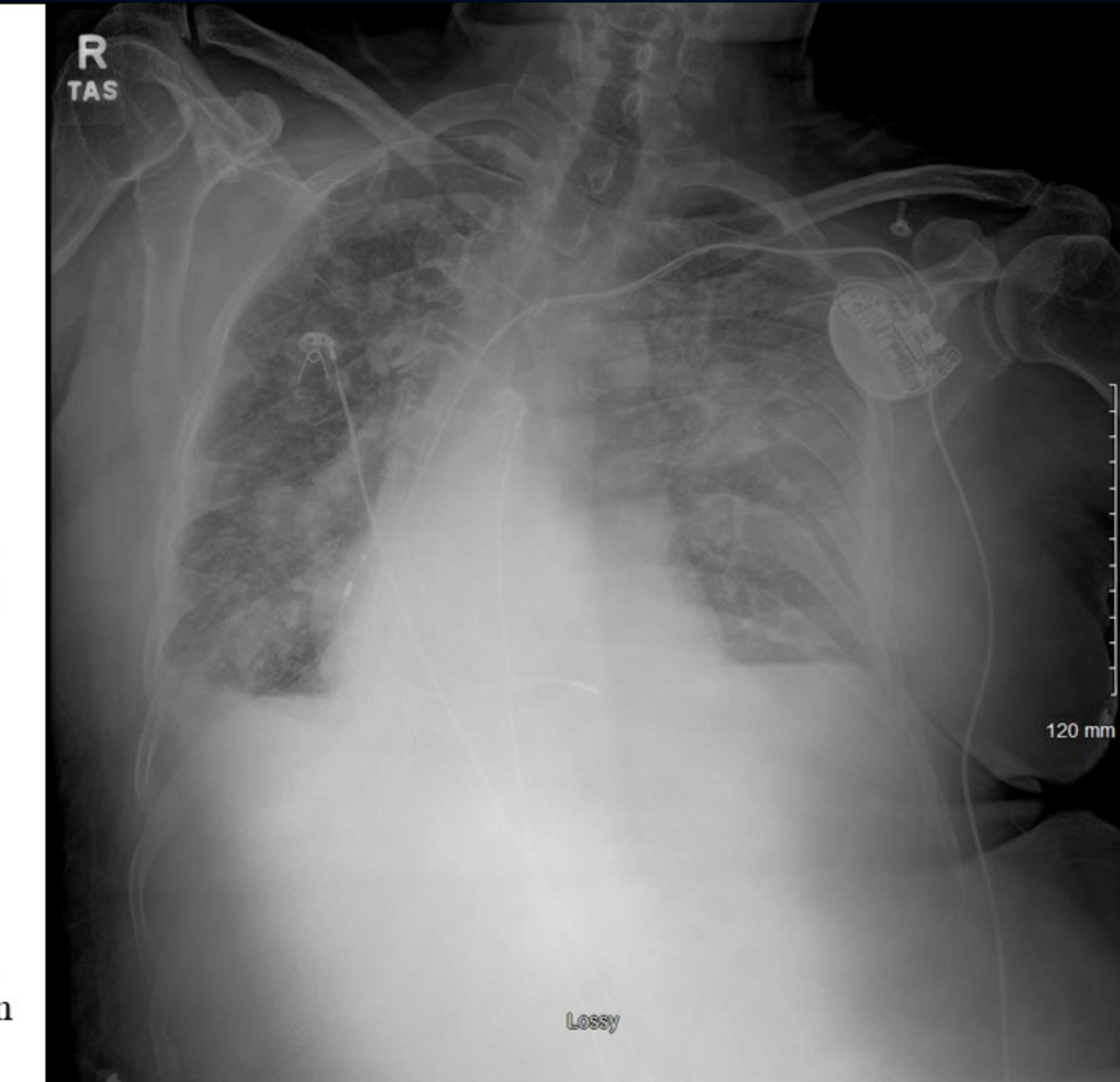
- An 83 year old male with history of asthma, hypertension, deep vein thrombosis, atrial fibrillation with pacemaker placement presented with shortness of breath symptoms that began on a commercial flight shortly after takeoff. On initial presentation the patient was febrile, dyspneic and hypoxic with wheezing on lung auscultation. Chest x-ray appeared to show a left lung lower lobe infiltrate and labs revealed leukocytosis. The patient was admitted for acute diagnosis of community acquired pneumonia with possible asthma exacerbation with empiric treatment initiated.
- Within 48 hours the patient deteriorated with worsening respiratory distress and hypoxia. Arterial blood gas was significant for hypercapnia. Repeat chest x-ray appeared to show worsening left and new right sided infiltrates. Non-invasive positive pressure ventilation was initiated with antibiotic coverage broadened. Chest computed tomography angiogram revealed bilateral pleural effusions and no evidence of pulmonary embolism. Transthoracic echocardiogram showed preserved ejection fraction with mild mitral and tricuspid regurgitation. Thoracentesis with pleural fluid studies were transudative by Light's criteria.
- The patient then developed signs of decreased perfusion with cold shock in all extremities. Leukocytosis persisted and respiratory status remained critical. Repeat transthoracic echocardiogram was notable for a mildly depressed ejection fraction, mild mitral and tricuspid regurgitation and dilated right ventricle. Hospital course was further complicated by recurrent tachyarrhythmia episodes and severe hypotension which prompted transfer to the intensive care unit.
- On review of echocardiography, right ventricular dysfunction with stable left ventricular function was noted – this, in combination with pulmonary edema and transudative effusion raised concern for mitral valve disease. Transesophageal echocardiogram was completed with findings of thickened mitral leaflets with bileaflet prolapse, no evidence of ruptured chord or vegetation, however doppler revealed severe, torrential, eccentric mitral regurgitation. Prior to surgical intervention, the patient developed worsening hemodynamic instability and cardiac arrest and succumbed to his underlying condition.

## Figures and Labs

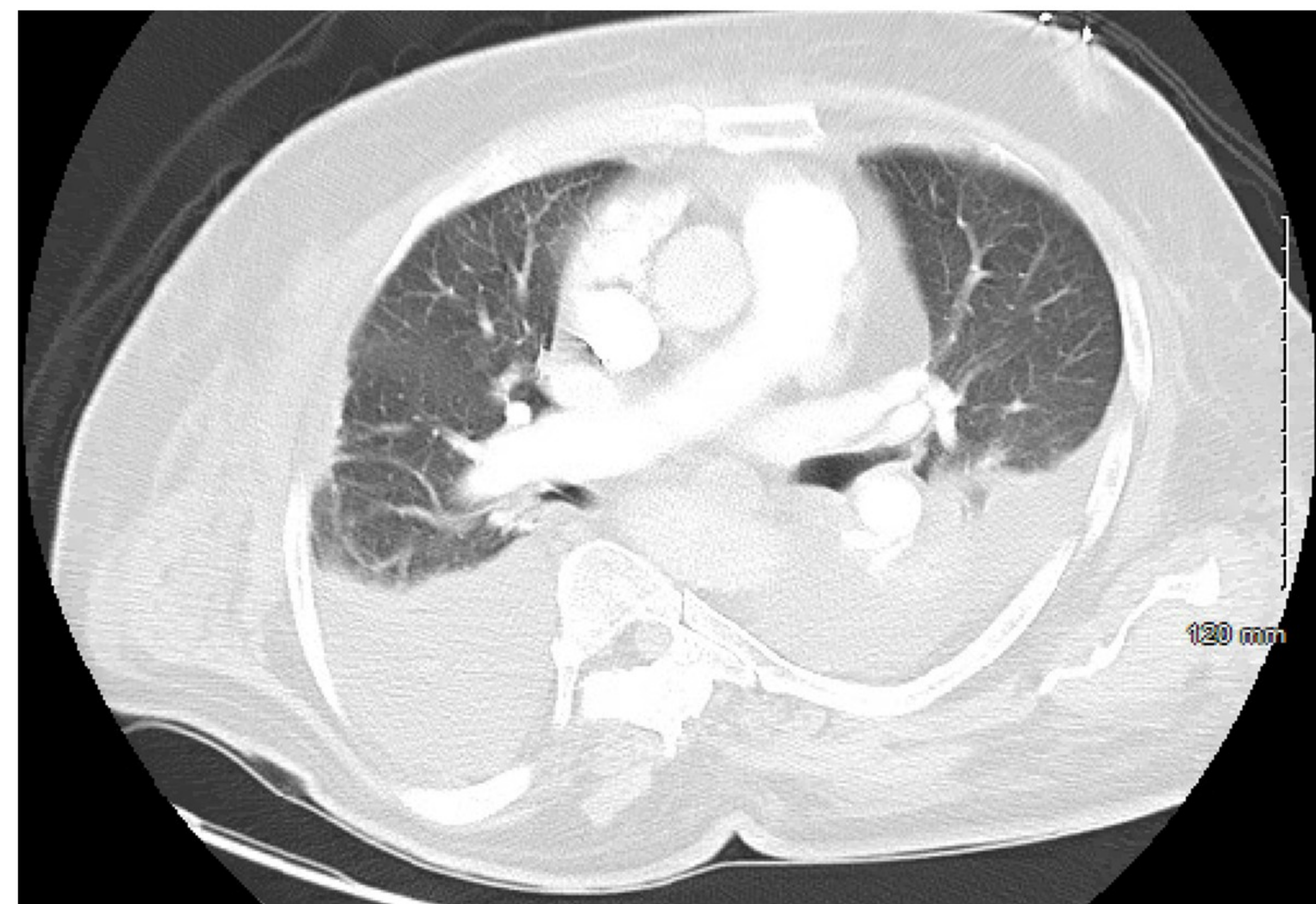


Example of mitral valve regurgitation seen during cardiac catheterization

Ahmed, Mustafa. *Mitral Regurgitation Assessment*. 25 May 2015. MyHeart.net. <https://myheart.net/articles/mitral-regurgitation/>. (May 2 2023)



Chest X-ray on decompensation prior to ICU transfer



Chest computed tomography angiogram demonstrating bilateral pleural effusions

## Discussion

- Compensatory adaptation of the dynamic cellular environment of the mitral valve in response to stressors can allow patients with MR to remain asymptomatic for many years.
- Transthoracic echocardiography (TTE) with doppler techniques are sensitive in detecting the qualitative presence of valvular regurgitation but unreliable in quantifying severity.
- The most frequently used tool to quantify MR severity is "eyeballing" the color flow jet area during doppler studies which can be misleading, as incongruent findings in interpretation of regurgitation severity are frequently observed.
- The dynamic nature of MR during myocardial contraction and varying volume conditions can cause further variability of MR quantification.
- The balance between mitral valve tethering and closing forces is delicate; sudden disruption, perhaps such as sudden exposure to an environment with decreased oxygen partial pressure, can lead to increased cardiac stress via hypoxic vasoconstriction and make the transition from asymptomatic to symptomatic MR and acute presentation.

## Conclusion

- The dynamic nature of the mitral valve to adapt in response to stressors can mask symptoms when MR is present, making diagnosis difficult.
- Color flow imaging should only be used for diagnosing MR with a more definitive, quantitative approach used when grading MR severity.
- Structured methodological approaches have been proposed to achieve more accurate quantification of MR severity, however if there is suboptimal image quality on TTE, or if there is discrepancy between the clinical presentation and the evaluation by TTE then transesophageal echocardiography (TEE) or cardiac MRI should be the next step in evaluating the etiology and severity of MR.

## References

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