An Unusual Case of a Papillary Muscle Rupture due to *Streptococcus mitis* Endocarditis

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Background

Severe mitral regurgitation (MR) due to papillary muscle rupture (PMR) is a rare and potentially fatal complication of infective endocarditis. We describe a case that demonstrates the importance of echocardiography in the diagnosis and management of this severe manifestation of infective endocarditis.

History of Present Illness

A 38-year-old man with no known PMH presented with acute left-sided facial and arm numbness along with progressive dyspnea and orthopnea over the past 4 months.

Physical Exam

- Vital Signs: Afebrile, HR 110 bpm, BP 88/57 mm Hg, O_2 saturation 99% on room air
- General: thin appearing
- Lungs: tachypneic, CTAB
- CV: tachycardic but regular rhythm, s1 and s2, II/VI holosystolic murmur that radiates to axilla and to back
- GI: soft, non-tender
- Neuro: A&O x3, no focal deficits
- Ext: no LE edema, pulses normal

Initial Work-Up

- WBC – 25,000/µL
- Hgb – 7.1 gm/dL
- CRP – 59.1 mg/L
- Troponin I – 1.67 ng/mL
- Pro BNP – 3430 pg/mL
- 4 out of 4 blood cultures positive for *Streptococcus mitis*

Transthoracic Echocardiography

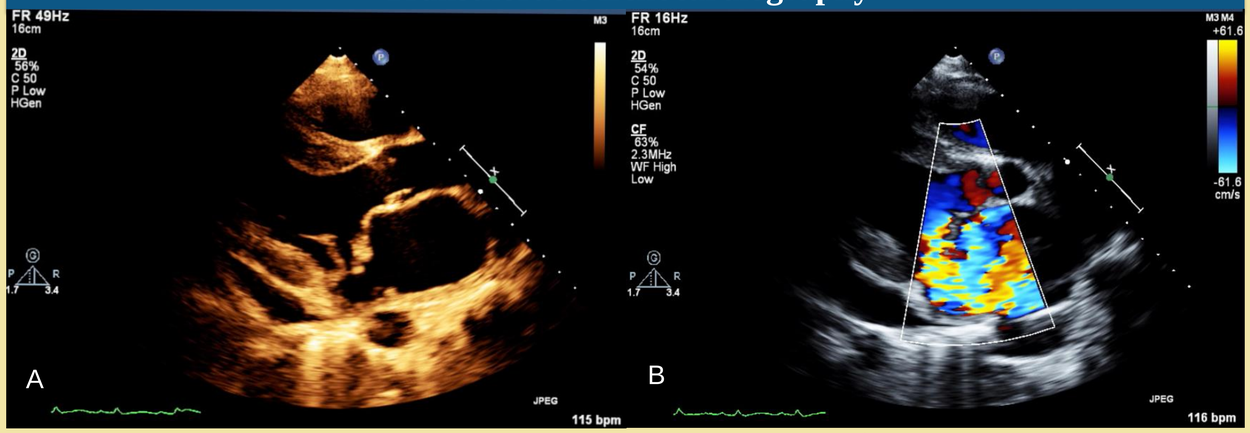

Figure 1. An emergent transthoracic echocardiogram demonstrated a dilated left ventricle, LVEF of 55-60%, severe MR with (A) a flail anterior leaflet and (B) posterolaterally-directed eccentric jet

Transesophageal Echocardiography

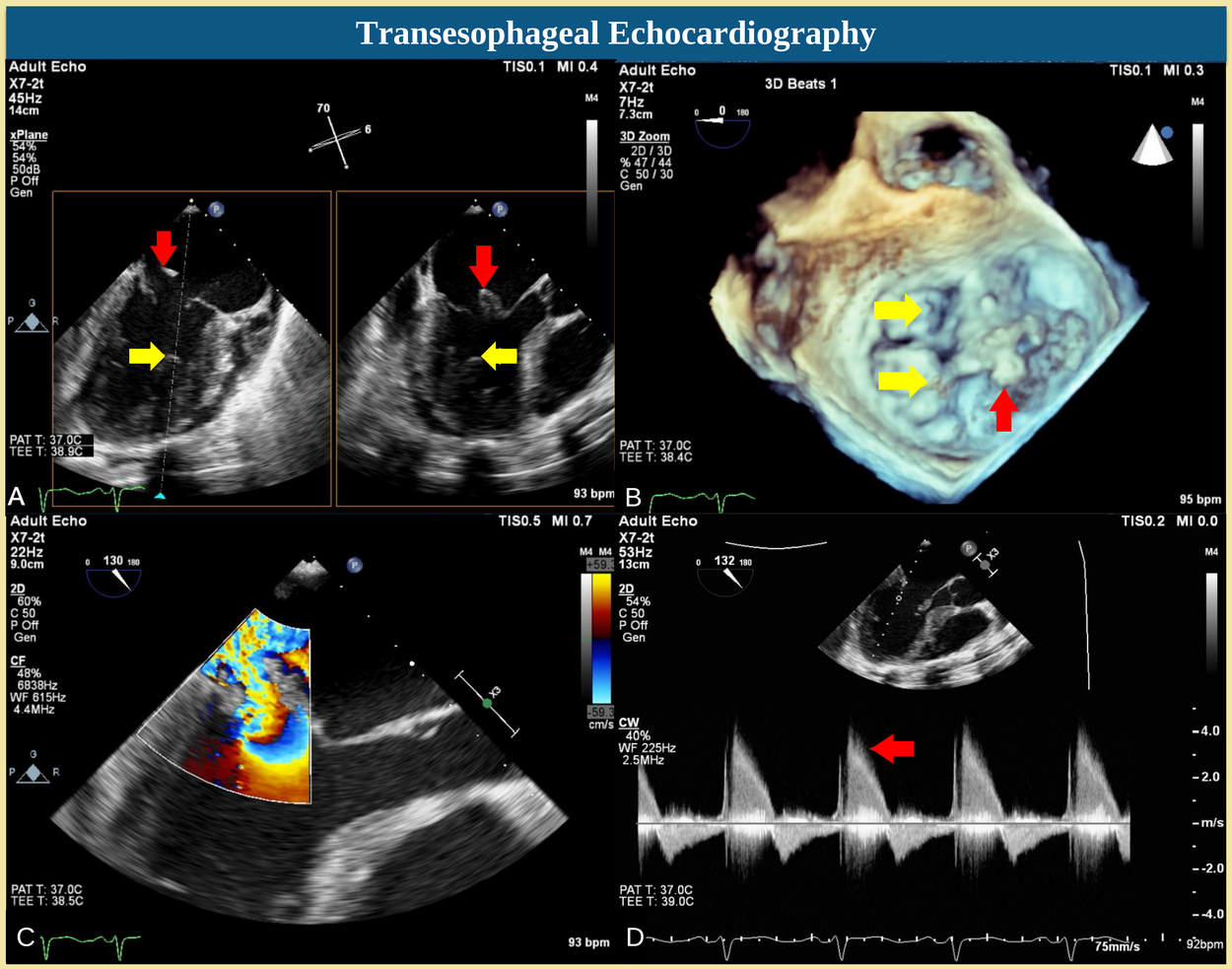

Figure 2. (A) Midesophageal view with X-plane. Head of papillary muscle (red arrows) ruptured from anterolateral papillary muscle (yellow arrows). (B) 3D surgeon's view with PMR (red arrow) and multiple vegetations (yellow arrows). (C) Midesophageal 3-chamber view with color Doppler. (D) Continuous wave Doppler signal through mitral valve is blunted (red arrow), known as the "cut-off" sign.

Additional Imaging

- CT Chest/Abd/Pel showed cardiomegaly, moderate pericardial effusion, and two areas of small splenic infarcts.
- MRI Brain showed a small subarachnoid hemorrhage and multiple areas of recent infarcts in the corpus callosum on the right side.

Treatment Plan

- In addition to severe MR with anterolateral PMR, echocardiography demonstrated severe pulmonary hypertension and moderate-to-large pericardial effusion without tamponade.
- With these findings, the patient was recommended for emergent mitral valve replacement.
- Operative evaluation confirmed the echo findings, including extensive involvement of the infection in the subvalvular apparatus.

Conclusions

- The patient's initial presentation and physical exam in isolation appeared mild.
- Echocardiography, however, demonstrated the true severity of this infective endocarditis with flair anterior leaflet and PMR.
- The soft systolic murmur can be explained by the eccentric jet with a blunted Doppler signal ("cut off" sign), consistent with severe MR (Figure 2D).
- Instead of medical management of his endocarditis due to S. mitis, echocardiography clearly indicated the need for emergent surgery.