A New Jet Stream: Sequential Perforation of Bicuspid Aortic and Mitral Valve in Haemophilus influenzae Endocarditis with Regurgitant Jet

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Introduction

- Bicuspid Aortic valve (BAV) is the most common congenital cardiac malformation affecting 1-2% of the population[1]
- Between 10-30% of bicuspid aortic valves will develop infective endocarditis (IE)[2]
- Haemophilus sp. accounts for less than 2% of documented infective endocarditis cases.[3]

Case Work-up

- A previously healthy 35 year old man presented with a 2 month history of weight loss, fatigue, fevers, rigors, and night sweats. He had been diagnosed with COVID-19 approximately 3 months prior and had been attributing symptoms to lingering infection/recovery.
- Vital signs were stable and physical exam in the emergency department would demonstrate a new grade 3/6 holosystolic murmur at the apex and grade 2/4 diastolic murmur best heard at the upper sternum. Exam was otherwise benign.
- Admission labs were significant for a WBC count of 5.7 (neutrophils: 73.2%), a C-RP of 9.06, and an ESR >120. Blood cultures were obtained
- Transthoracic echocardiography revealed previously unknown bicuspid aortic valve (AV) with moderate to severe eccentric AV regurgitation directed and causing additional moderate regurgitation of the mitral valve (MV) with possible vegetations on the aortic and mitral valves.
- Transesophageal echocardiography further illustrated Sievers 1A BAV with raphe between right and left coronary cusp, with moderate-severe eccentric regurgitation through a perforation in the noncoronary cusp and associated 8mm vegetation. This jet directed at the aortic-mitral shelf causing and approximate 1cm perforation in the area between the A2 leaflet and noncoronary cusp, causing moderate mitral regurgitation through the perforation. (Figure 1-3)
- Cardiac CTA would rule out perivalvular abscess and describe abnormal contour of the MV with a prolapse of approximately 1 cm in addition to BAV. (Figure 4)
- Blood cultures returned positive for Haemophilus influenzae

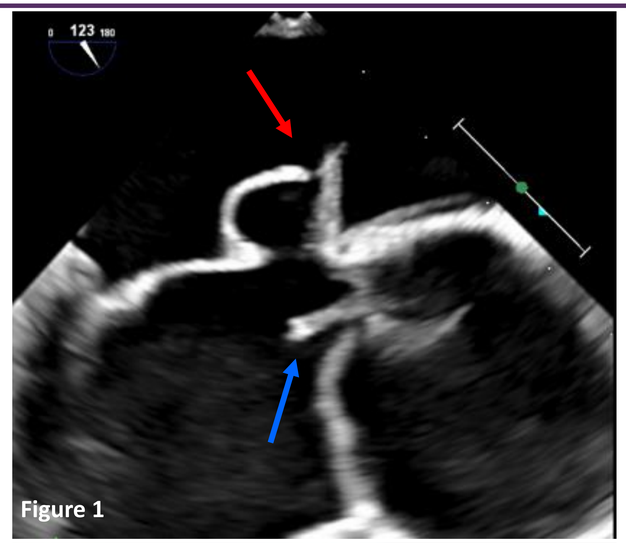

Figure 1

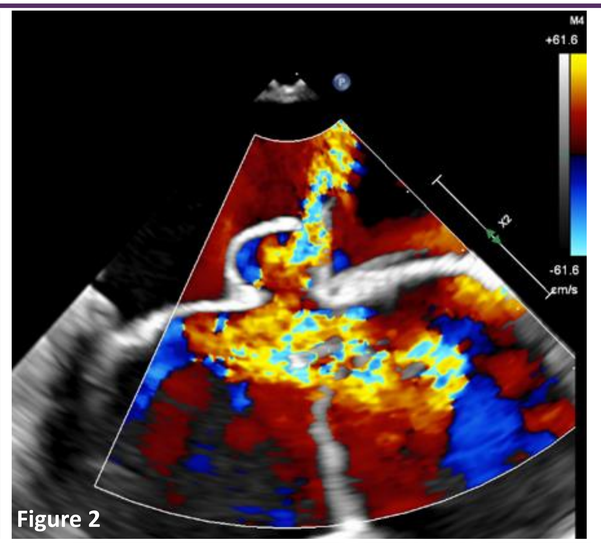

Figure 2

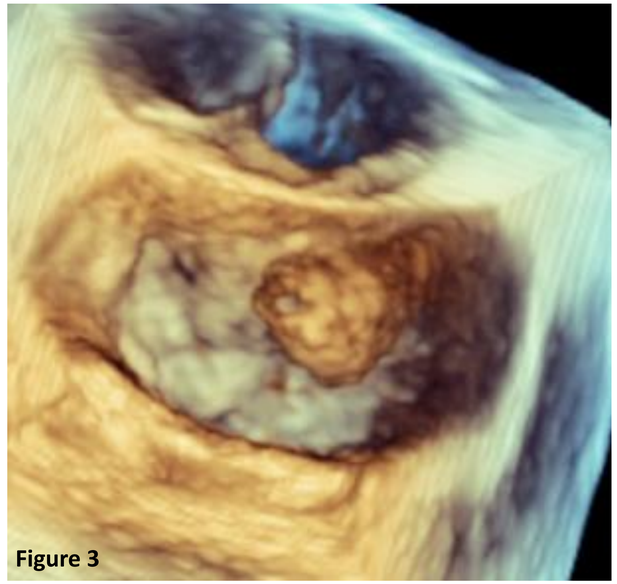
Figure 3


Figure 3

Figure 1 and 2: TEE, Color compare of BAV and MV at 123° showing vegetation (blue arrow) with regurgitant jet through perforation causing MV outpouching and perforation (red arrow).
Figure 3: TEE, Outpouching and perforation causing nipple like structure at the A2 leaflet of Mitral Valve
Figure 4: CTA, Abnormal contour/outpouching of the mitral valve adjacent to aortic valve defect (white arrow)

Case Intervention

- Infectious disease and Cardiothoracic subspecialties were consulted given Duke Criteria definitive IE
- Patient was started on broad spectrum antibiotics tailored to ceftriaxone and levofloxacin upon culture data
- Brain MRI would reveal microembolic phenomena without evidence of mycotic aneurysm
- Given destructive lesion of native AV and MV in setting of infective endocarditis, patient was referred for surgical aortic and mitral valve replacement at Heart Team Conference. (Class I)
- Patient proceeded to surgical bioprosthetic AVR and MVR with aorto-mitral curtain reconstruction at outside referral center (Commando Procedure)
- Patient was completed an outpatient intravenous antibiotic course for 6-weeks.
- Given active duty status, the patient was assigned to temporary limited duty status and referred to cardiac rehabilitation.

Discussion

- Haemophilus influenza is an uncommon and often indolent source for infective endocarditis and is particularly rare given modern vaccinations
- Untreated or indolent infective endocarditis has been described as causing multi-valvular destruction with continuous regurgitant jet-flow, such as in our patient.
- Surgical intervention, combined with intravenous antibiotics, is the standard of care in infective endocarditis treatment with penetrating lesions. Due to the proximity of this patient's lesions to the intervalvular fibrous body, reconstruction is warranted and accomplished by the "Commando Procedure."

References

References available upon request

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