Fatal Connection: Aortic valve endocarditis complicated by aorta-cavitary fistula

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Introduction:

- Aortic valve (AV) infective endocarditis can be complicated by the spread of the infection to its adjacent structures.
- A rare but serious complication of AV endocarditis is the development of aorta-cavitary fistula (ACF).
- These abnormal tracts form intracardiac shunts posing a unique challenge.
- Even with prompt recognition and management, ACF has a high mortality rate of around 40%.

Hospital Course:

- A 43-year-old male presented with fever and dyspnea and was found to be in cardiogenic shock.
- Electrocardiogram showed a complete heart block (Figure 1).
- Transthoracic echocardiogram (TTE) revealed an ejection fraction of 60-65%, bicuspid Aortic Valve (AV) with vegetation and severe aortic insufficiency (AI), small ventral septal defect and was suspicious for a fistula from the aorta to the right atrium (Figure 2, 3).
- He was emergently taken to the Operating room for a mechanical AV replacement, reconstruction of the aortic root with obliteration of the abscess cavity, using a bovine pericardial patch, and patch repair of fistula to the RA.
- Sutures had to be placed through friable tissue. Post-operatively, he was managed in the ICU requiring significant hemodynamic support. Blood cultures grew Streptococcus Agalactiae, treated with ceftriaxone. A dual chamber pacemaker was subsequently placed. Patient was followed with serial TTEs on discharge.
- Two weeks later he was readmitted with worsening dyspnea.

Imaging:

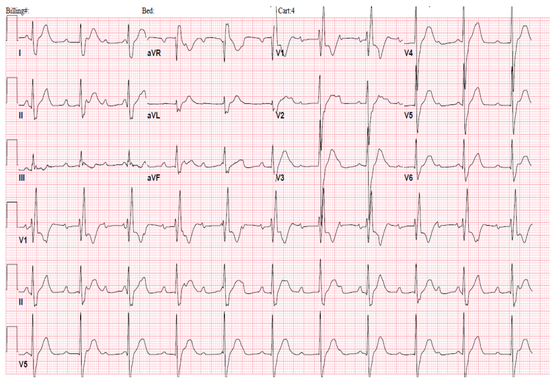

Figure 1. Patient's Electrocardiogram on admission revealed a complete heart block with a right bundle branch morphology.

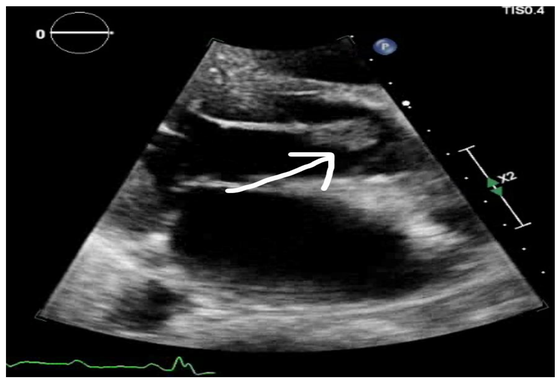

Figure 2. Parasternal long axis view demonstrating aortic valve (AV) with vegetation.

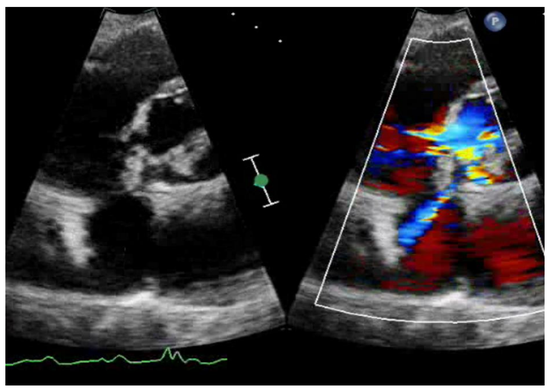

Figure 3. Severe aortic insufficiency and jet suspicious for fistula from the aorta to the right atrium illustrated on TEE short axis.

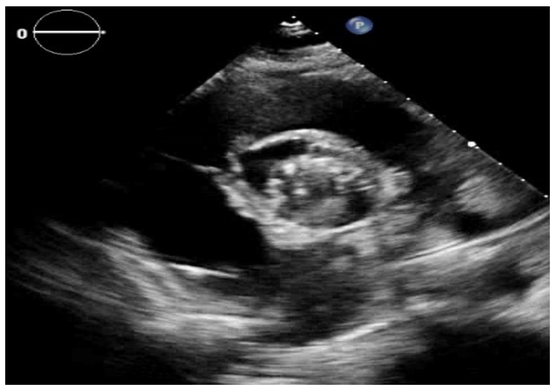

Figure 4. TEE short axis view during second admission demonstrating echogenic thickness around AV annulus suggestive of abscess.

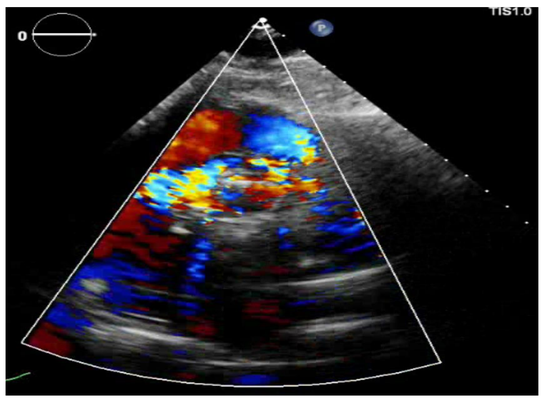

Figure 5. TEE short axis view of left ventricle outflow tract revealing severe aortic insufficiency, VSD below AV annulus with worsening L to R shunt.

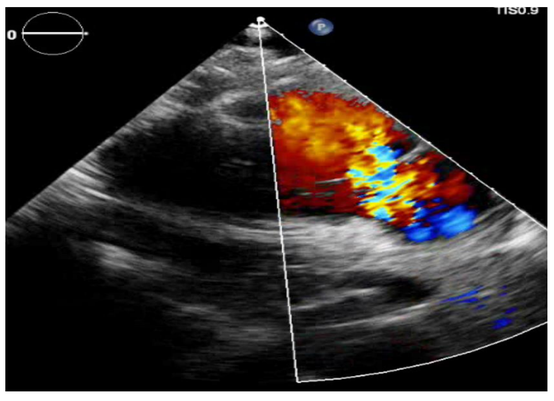

Figure 6. Another view of TEE four chamber view demonstrating VSD below AV annulus with worsening L to R shunt.

- TTE showed EF of 75-80%, echogenic thickness around annulus suggestive of abscess. Also concerning was recurrent aortic to RA or RV fistula with now worsening L to R shunt, VSD below AV annulus, and PA pressure 118-125 mmHg (Figure 4, 5, & 6).
- Patient initially responded to diuretics and surgical intervention was delayed to allow time for friable tissue to heal.
- However, he developed worsening right sided heart failure and hepatic congestion with markedly elevated LFTs and INR to 8.9.
- Patient had emergency surgery which included takedown of previous AV replacement and dehisced patch repair of VSD, patch repair and closure of large VSD, aortic root replacement with a porcine xenograft, and single aortocoronary bypass of the right coronary artery with reverse saphenous vein graft.
- Patient required intra-aortic balloon pump and ECMO for hemodynamic support.
- He was transitioned off ECMO and hemodynamic values improved and was successfully discharged home.

Discussion:

- Infective endocarditis complicated by ACF accrue a high mortality not only due to the challenging nature of surgical intervention but also because a significant number of these patients develop intracardiac shunts which compounds the difficulty in management (Figure 5-6).
- Thus, clinicians should be attuned to diagnosing IE and seek urgent surgical consultation to try and prevent an abscess from spreading to surrounding tissue structures.
- In patients with ACF, clinicians should be vigilant in monitoring signs of worsening L to R shunting which can lead to life threatening right sided heart failure and hepatic congestion.

References:

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