Chiari-Eustachian Valve Infective Endocarditis: A Rare Consequence of Implanted Venous Access Ports.

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Abstract

We present a case of Chiari-Eustachian valve endocarditis in an elderly male who presented after removal of a central venous access port. This case report also reviews the prevalence of right sided endocarditis, diagnosis, common microorganisms, predisposing risk factors and medical management [1-5]. Eustachian valve endocarditis was first described in 1986 by Edwards et al. and from 1986 to 2017, only 37 cases have been reported, 46% of which were caused by intravenous (IV) drug use and 24% by indwelling intravenous lines. Other risk factors for the development of eustachian valve endocarditis include rheumatic heart disease, pacemaker wires and immunological compromise. This case illustrates the importance of recognizing risk factors other than IV drug use in the pathogenesis of right-sided endocarditis, especially in cases involving the eustachian valve.

Objective

The objective of this case report is to highlight the importance of identifying vestigial structures and their roles in Right-sided Endocarditis

Introduction

- The eustachian valve (EV) is an embryologic remnant found at the junction of the inferior vena cava and the right atrium.
- It forms a thick ridge inferiorly in the right atrium [1]. Embryologically, the valve played a role in directing oxygen-rich blood from the IVC away from the tricuspid valve and toward the foramen ovale [2].
- After birth it is completely regressed in some individuals and remains partially regressed or fully persistent in others [2]. This leads to a range of ridge thickness that can be noted on echocardiography
- Eustachian valve endocarditis is an extremely rare consequence of this embryologic remnant that may be potentially underdiagnosed

Hospital Course

The patient was an 86-year-old man with adenocarcinoma of the lung that was metastatic to the cerebellum, status post chemotherapy and radiation treatments who presented with nondescript diffuse right shoulder pain for three days. He reported 14 weeks of chemotherapy once weekly with Lambrolizumab. He had no known intravenous drug use history. The patient endorsed fevers and chills for three days but denied dizziness, headache, chest pain/tightness, diaphoresis, shortness of breath, abdominal pain, nausea, vomiting, diarrhea, or dysuria. He was subsequently found to be febrile and blood cultures taken in the Emergency Room eventually grew gram positive cocci in clusters in two out of two sets. He met criteria for severe sepsis on admission and was placed on empiric antibiotics, T-max was 101.5° with heart rate 103 (SBP was stable in 140s systolic).

On day 2, repeat cultures were collected as the source for the bacteremia was unknown. An MRI of the right shoulder to rule out osteomyelitis was only remarkable for mild diffuse osteopenia. A 2D Echocardiogram was obtained to rule out endocarditis which demonstrated EF of 55-65%, no valvular abnormality, and no wall motion abnormalities. With the third set of cultures still positive, a transesophageal echocardiogram (TEE) was ordered and Cardiology was consulted.

A standard 2D TEE with spectral and color-flow Doppler was performed. Right ventricular systolic function was normal. The Interatrial septum was aneurysmal with no evidence of atrial septal defect. Left atrium was normal in size. Right atrial size was grossly normal. There was a mobile echo dense mass attached to the Chiari/Eustachian valve, measuring 0.8 cm by 0.6 cm (Figure 1).

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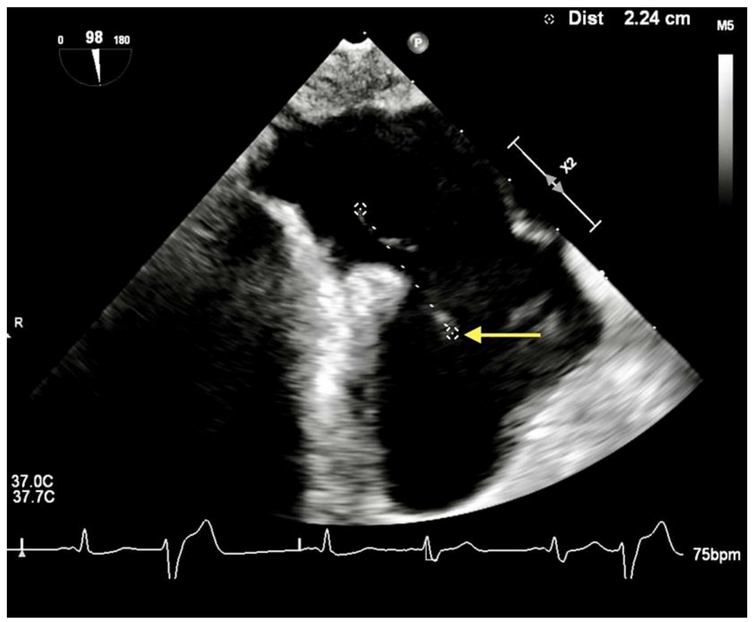

Figure 1: Transesophageal Echocardiogram showing a mobile echo dense mass (yellow arrow) attached to the Chiari-Eustachian valve complex within the right atrium. The top right corner estimates the two dimensional length and width of the mass in centimeters (cm).

Discussion

- Endocarditis involving this embryologic remnant was first described in 1986 during an autopsy by Edwards et al. In 2017, there were 37 cases described in 29 case reports. An updated search of the National Library of Medicine results in 53 total case reports
- When reviewing the literature on endocarditis, the right side accounts for approximately 10% of cases. Classically, risk factors for right sided endocarditis include intravenous drug use, recent central venous catheter, or intracardiac device placement.
- The most common organism seen in right sided endocarditis is *Staphylococcus aureus*, accounting for 60-90% of cases. When looking at those who had right sided endocarditis due to the eustachian-chiari network, 44% of these patients were IVDU, 52% did not have involvement of other cardiac structures and 70% required a transesophageal echocardiogram for accurate diagnosis.

Conclusion

Interrogating all valves, including the vestigial valves during echocardiography in patients with a high suspicion of endocarditis should be done in addition to particular attention to imaging of nonstandard locations of right-sided IE. While TTEs are typically done initially, TEEs have more sensitivity and can identify smaller valvular vegetations or lesions. While IV drug usage is the most common risk factor for right-sided infective endocarditis, it is not the only risk factor. Prolonged venous access ports is an equally important risk factor. This case highlights the importance of recognizing all the risk factors that can cause right sided endocarditis and further emphasizes the utility of TEEs in identifying endocarditis involving the Chiari-Eustachian complex.

References

1. Schuchlenz W, Saurer G, Weihs W. et al. Persisting eustachian valve in adults: Relation to patent foramen ovale and cerebrovascular events. J Am Soc Echocardiogr. 2004; 17: 231-233. https://www.jcvaonline.com/article/S1053-0770(20)31362-8/fulltext
2. Yavuz T, Nazli C, Kinay O, Kutsal A. Giant eustachian valve with echocardiographic appearance of divided right atrium. *Tex Heart Inst J*. 2002;29(4):336-338.
3. Mahamid M, Mashiah J, Rozner E, Jabaren M, Turgeman Y, Koren O. Right-Sided Endocarditis involving Eustachian Valve Following the Use of a Central Venous Line. Am J Case Rep. 2020 Sep 14;21:e923465. doi: 10.12659/AJCR.923465. PMID: 32925870; PMCID: PMC7518643.
4. Topan A, Carstina D, Slavcovici A, Rancea R, Capalneanu R, Lupse M. Assesment of the Duke criteria for the diagnosis of infective endocarditis after twenty-years. An analysis of 241 cases. *Clujul Med*. 2015;88(3):321-326. doi:10.15386/cjmed-469

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