Eustachian valve endocarditis

Jerry Fan, MD^a , Phuong Tram N. Le, MD^b, and Billy Don Jones, MD^b

^aDepartment of Internal Medicine, Baylor Scott & White Hospital, Temple, Texas; ^bDepartment of Cardiology, Baylor Scott & White Hospital, Temple, Texas

ABSTRACT

Eustachian valve infective endocarditis is rare and mostly affects intravenous drug abusers and those with implanted medical devices or indwelling central venous catheters. The most commonly identified organism is *Staphylococcus aureus*. Treatment includes intravenous antibiotics for approximately 6 weeks. We present a case of *Staphylococcus aureus* Eustachian valve endocarditis in an individual without traditional risk factors.

KEYWORDS Endocarditis; Eustachian valve; vegetation

Remnants of the right sinus venosus can form an embryologic abnormality called the Eustachian valve.^{1–3} In adults, it is inconsequential and benign without any significant hemodynamic or clinical significance.¹ Most cases of Eustachian valve endocarditis are the result of intravenous drug abuse or occur iatrogenically from indwelling catheters, pacemaker wires, or immunodeficiency.⁴ *Staphylococcus aureus* accounts for the majority of cases.^{1,3} Most are diagnosed on transesophageal echocardiogram rather than transthoracic echocardiogram due to the location of the Eustachian valve.³ We present a case of a Eustachian valve endocarditis without traditional risk factors.

CASE DESCRIPTION

A 50-year-old man with known diabetes mellitus, hypertension, hyperlipidemia, and peripheral vascular disease presented to the emergency department with complaints of right-sided shoulder, chest, and abdominal pain for the past day. The white blood cell count was 25.0/L; glucose, 761 mg/dL; blood urea nitrogen/creatinine, 31/1.87 mg/dL; troponin, 0.00 ng/dL; D-dimer, 1.57 µg/mL; lactic acid, 1.4 mmol/L; and procalcitonin, 1.62 ng/mL. Inflammatory markers were significantly elevated, with a C-reactive protein of 378.4 mg/L. Blood cultures were positive for methicillin-sensitive *Staphylococcus aureus* (MSSA). The patient denied any intravenous drug use, and urine drug screen was negative.

The patient was empirically started on vancomycin and ceftriaxone, which was later de-escalated to cefazolin once

sensitivity was confirmed. Urine culture was positive for MSSA and thus was considered the nidus of his bacteremia. Transesophageal echocardiogram revealed a mobile, elongated, and oval-shaped mass with a smooth surface measuring 3.2 × 1.2 cm in the right atrium attached to the Eustachian valve (*Figure 1*) (Supplemental Video). After 6 weeks of treatment, his MSSA endocarditis resolved.

DISCUSSION

The Eustachian valve is a “remnant of the valve of the right sinus venosus, also known as the valve of the inferior vena cava,” which rarely persists into adulthood.^{2–5} Eustachian valve endocarditis usually manifests in intravenous drug abusers or those with implanted medical devices or indwelling central venous catheters. *Staphylococcus aureus* is the causative organism in approximately 53% of cases.^{1–6}

However, Eustachian valve endocarditis may be more common than previously thought because routine examination of the Eustachian valve is not commonly performed when looking for endocarditis.⁶ Furthermore, the location of the Eustachian valve “does not support high-velocity jets nor pressure gradients,” which may explain why endocarditis occurs less frequently in that location.⁶

The most common presenting symptoms include fever, chills, and positive blood cultures.¹ Intriguingly, our patient had none of the traditional risk factors for development of a right-sided endocarditis. Furthermore, despite extensive

Corresponding author: Jerry Fan, MD, Department of Internal Medicine, Baylor Scott & White Hospital, 2401 S. 31st St., Temple, TX 76504 (e-mail: jerry.d.fan@gmail.com)

Color versions of one or more of the figures in the article can be found online at www.tandfonline.com/ubmc.

Received May 23, 2019; Revised July 8, 2019; Accepted July 18, 2019.

Figure 1. Transesophageal echocardiogram showing a mobile elongated oval-shaped mass with a smooth surface measuring 3.2×1.2 cm: (a) four-chamber view; (b) 90° view; (c) bi-planar view.

workup, no other identifiable source of infection was found besides the urinary tract infection.

In general, transesophageal echocardiogram is the preferred method for visualization because transthoracic echocardiograms can miss right-sided vegetations.^{3,4} Treatment is largely focused on culture-directed antibiotic therapy for at least 4 to 6 weeks.^{1,3,4} Surgical intervention is reserved for hemodynamically compromising vegetations and those that do not resolve with antibiotics.⁴

SUPPLEMENTAL MATERIAL

Supplemental data for this article can be accessed at <https://doi.org/10.1080/08998280.2019.1646595>.

ORCID

Jerry Fan <http://orcid.org/0000-0002-5841-9491>

Billy Don Jones <http://orcid.org/0000-0002-6255-8486>

1. Sawhney N, Palakodeti V, Raisinghani A, Rickman LS, DeMaria AN, Blanchard DG. Eustachian valve endocarditis: a case series and analysis of the literature. *J Am Soc Echocardiogr.* 2001;14:1139–1142. doi:10.1067/mje.2001.114012.
2. Wong RC, Teo SG, Yeo TC. An unusual right-sided endocarditis: a case report of Eustachian valve endocarditis. *Int J Cardiol.* 2006;109:406–407. doi:10.1016/j.ijcard.2005.05.035.
3. Veiga VC, Molinari AC, Farias CM, et al. Eustachian valve endocarditis. *Arq Bras Cardiol.* 2007;88:e79–e80. doi:10.1590/S0066-782X2007000400025.
4. Alreja G, Lotfi A. Eustachian valve endocarditis: rare case reports and review of literature. *J Cardiovasc Dis Res.* 2011;2:181–185. doi:10.4103/0975-3583.85266.
5. Pellicelli AM, Pino P, Terranova A, D'Ambrosio C, Soccorsi F. Eustachian valve endocarditis: a rare localization of right side endocarditis. A case report and review of the literature. *Cardiovasc Ultrasound.* 2005;3:30. doi:10.1186/1476-7120-3-30.
6. San Román JA, Vilacosta I, Sarriá C, Garcimartín I, Rollán MJ, Fernández-Avilés F. Eustachian valve endocarditis: is it worth searching for? *Am Heart J.* 2001;142:1037–1040. doi:10.1067/mhj.2001.119125.