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Vegetation Attached to the Left Interatrial Septal Surface at the Congenital Location of the Foramen Ovale: A Rare Occurrence

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Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

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Conflict of interest: None declared

Patient: Male, 57
Final Diagnosis: Infective endocarditis vegetation attached to the congenital foramen ovale location
Symptoms: Dysuria • fatigue • fever
Medication: —
Clinical Procedure: Trans thoracic echocardiography • trans esophageal echocardiography • redosternotomy
Specialty: Cardiology

Objective: Rare disease

Background: Non-valvular mural infective endocarditis (IE) is a rare bacterial growth on cardiac walls. Several risk factors have been reported. Echocardiography is an important diagnostic modality for diagnosing vegetation attached to the intracardiac walls.

Case Report: We present the case of a 57-year-old man admitted with *Staphylococcus aureus* bacteremia due to an infected tunnelled hemodialyses catheter. Transthoracic echocardiogram did not show any abnormality, but transesophageal echocardiogram (TEE) revealed a 1.7×0.8 cm mobile echo-density attached to the surface of the interatrial septum in the left atrium, where the foramen ovale (FO) exists in utero. The patient was transferred to another facility for re-do sternotomy cardiac surgery, where these findings were confirmed intraoperatively. A biopsy of the mass was taken, which confirmed it to be a vegetation attached to the FO.

Conclusions: We report the first case in the literature of vegetation attached to the surface of the interatrial septum in the left atrium at the congenital location of the foramen ovale. There have been no previously reported cases in the literature with such novel imaging findings.

MeSH Keywords: Echocardiography, Transesophageal • Endocarditis • Foramen Ovale • Foramen Ovale, Patent

Full-text PDF: http://www.amjcaserep.com/abstract/index/idArt/900848

Background

Non-valvular mural IE involves bacterial growth on cardiac walls without affecting the valvular endothelium. Only 62 cases were reported between 1970 and 2005. The most common risk factors are high-velocity regurgitant jets causing endothelial injury and micro-organism invasion, congenital shunts, systemic immunosuppression, prosthetic valves, and pacemakers [1,2]. Echocardiography is a principal modality for diagnosing it. It is useful to perform TEE when there is a high index of suspicion or if the transthoracic echocardiogram (TTE) is non-diagnostic. TEE is preferred over TTE for the diagnosis of mural IE [1,2]. In this report, we present a case of biopsy-proven vegetation that was seen to be attached to the foramen ovale in a patient with *Staphylococcus aureus* bacteremia due to an infected indwelling hemodialyses catheter.

Case Report

The patient was a 57-year-old white male with a past medical history of coronary artery disease status post (s/p) coronary artery bypass graft, heart failure with normal ejection fraction, severe pulmonary hypertension (PH), severe tricuspid regurgitation (TR), diabetes mellitus type 2, hypertension, hyperlipidemia, end-stage renal disease on hemodialyses (HD) for the previous 2 months, morbid obesity, and obstructive sleep apnea. He presented to us from an acute rehabilitation center for evaluation of sudden new-onset of high fever associated with dysuria and worsening of chronic fatigue since one day. Review of systems was negative. He denied history of drug abuse except occasional cigar smoking. Home medications were aspirin, diltiazem, insulin, iron, carvedilol, pravastatin, and clopidogrel. On admission, vital signs included temperature of 102°F (38.9°C), blood pressure of 95/46 mmHg, respiratory rate of 18/min, pulse of 67/min, and saturation of 91% on 3 liters of oxygen. On exam, he was a jaundiced and lethargic male with an HD catheter on the right chest wall, with erythema and mild tenderness at the insertion site. Cardiovascular exam revealed a 2/6 holosystolic murmur at the tricuspid area. Both lungs were clear to auscultation. His abdomen was flat, soft, non-tender, and we found no hepatosplenomegaly. Laboratory test results were significant for mild hyponatremia (sodium of 129 mEq/L), BUN 62 mg/dL, creatinine 5.2 mg/dL, alkaline phosphatase 719 units/L, and total bilirubin 5.0 mg/dL. Complete blood count showed white blood cells (WBCs) of 19 000/ml, hemoglobin of 9.7 g/dL, and platelets of 312 000/ml. Urine analysis showed turbid urine with WBCs greater than 100, moderate bacteria, negative nitrites, and positive leukocyte esterase. The patient was admitted for sepsis secondary to urinary tract infection and HD catheter infection. He was started on broad-spectrum antibiotic coverage with vancomycin and Ertapenem after drawing blood cultures. Antibiotic dosages were adjusted

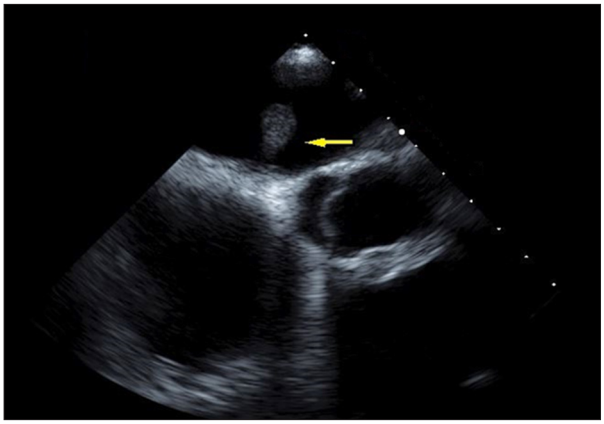

Figure 1. Transesophageal echocardiogram (TEE) showing 1.7×0.8 cm mobile echo-density attached to the interatrial septum in the left atrium arising from the congenital site of the foramen ovale (arrow).

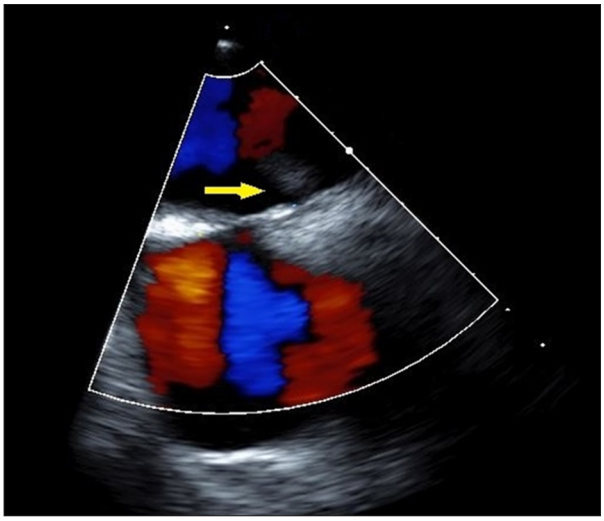

Figure 2. Transesophageal echocardiogram with Doppler, again showing the vegetation but no blood flow through interatrial septum, thereby revealing no patency of the foramen ovale (arrow).

on the basis of his end-stage renal disease, and vancomycin levels were monitored with the target trough levels at 15–20 microgram/milliliter. His HD catheter was removed and the tip was sent for culture. Blood culture and catheter tip cultures grew *Staphylococcus aureus*, which was sensitive to Oxacillin. On the basis of culture and sensitivity, antibiotics were de-escalated to Oxacillin IV every 4 h. Vancomycin and Ertapenem were stopped. TTE was negative but TEE showed severe TR and 1.7×0.8 cm mobile echo-density (Figures 1, 2) attached to the interatrial septum and in the left atrium where the foramen ovale is present during the intrauterine life. This mass was suspicious for myxoma, vegetation, or thrombus. (He had 2 TEEs in the past which were negative for IE, or intracardiac shunts on color flow Doppler imaging.)

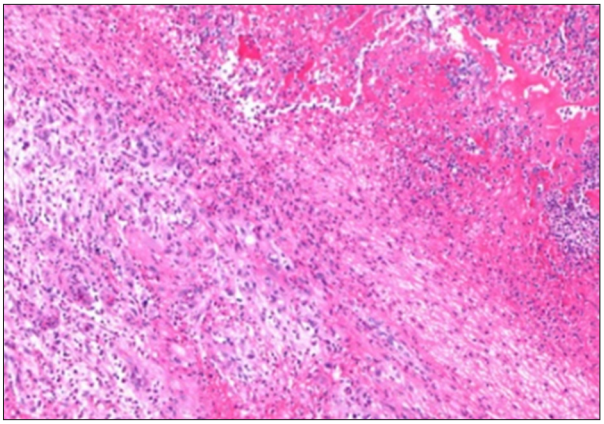

Figure 3. Pathology slide obtained from biopsy of the interatrial mass, revealing fibrinous exudate with neutrophilic and macrophage infiltration.

The patient was transferred to another hospital for re-do sternotomy cardiac surgery, which confirmed TEE findings. Excisional biopsy was consistent with vegetation and revealed fibrinous exudate with neutrophilic and macrophage infiltration (Figure 3). On postoperative day 5, he developed respiratory failure requiring reintubation and unsuccessful weaning from the ventilator after multiple attempts; therefore, he received a tracheostomy. Considering his poor prognosis and after extensive discussion with the family, his code status was changed to comfort care and he was transferred to hospice.

Discussion

Intracardiac masses are rare, and fortunately do not have a long differential diagnoses. Myxomas, thrombus (blood clot), or vegetations secondary to mural endocarditis are the most common conditions giving rise to intracardiac masses. Rarely, benign and malignant tumors can also arise within and from the cardiac walls. Benign tumors include rhabdomyomas, lipomas, fibromas, papillary fibroelastomas, angiomas, teratomas, and mesotheliomas. Malignant tumors can be primary or secondary to metastasis, and include sarcomas, lymphomas, mesotheliomas, and carcinoids [3]. Myxomas and thrombi are by far the most common presentations. These masses need to be evaluated as soon as possible once they are identified, to avoid the risk of embolization and long-term catastrophic sequel, which includes stroke and death.

Despite advances in diagnosis and treatment of IE, various unusual presentations of this disease entity are clinically encountered. Vegetation seen in IE usually originate from valves, but in rare cases a vegetation can be entrapped in a PFO after it has dislodged [4,5]. However, vegetation seen in mural IE generally arise from the cardiac walls. Mural IE generally occurs in conjunction with valvular IE, myocardial abscess, and/or cardiac structural abnormalities. It also arises from ventricular walls without valvular IE or cardiac structural defects like PFO or atrial septal defect (ASD) [1].

Catheter insertion for HD is an independent risk factor for methicillin-sensitive *Staphylococcus aureus* (MSSA) and methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia [6]. Patients with MSSA or MRSA bacteremia secondary to infected hemodialysis catheters often present atypically, and therefore have high in-hospital mortality (21%) and 6-month mortality (27%) [6].

In our patient, TEE showed vegetation attached to the foramen ovale at the interatrial septum on the left side of the heart. A possible explanation for this could be an acquired interatrial communication like a PFO that might have occurred due to bacterial seeding and perforation of the septum, thus resulting in passage of vegetation or thrombus from the right side to the left side of the heart. This vegetation or thrombus could have lodged into the foramen ovale and increased in size due to superimposed infection, thereby causing a temporary closure of the PFO. A similar phenomenon was discussed by Johri et al. in their case report [7].

In the case presented by Turek et al., it was believed that the patient's PFO became apparent after the flail posterior tricuspid leaflet directed a strong tricuspid regurgitation jet toward the septum, thereby causing a temporary "flaplike" opening in the interatrial septum [8]. Similarly, in our patient, a transient PFO may have occurred secondary to elevated right-side pressures in the presence of TR and severe PH, which is also supported by the bulging of the interatrial septum into the left atrium seen on initial TTE. However, we were unable to conclusively demonstrate right-to-left shunting through a PFO on the TEE, even with the aid of color Doppler imaging, and also there was no evidence of any vegetation on the tricuspid valve. Interestingly, TTE done at this visit failed to demonstrate severe TR, which was repeatedly reported on several previous TTE.

Another possible explanation is a direct inoculation of the bacteria on a previously injured endocardium of the interatrial septum near the foramen ovale, with the vegetation growing to its large size over a long period of time. However, this is unlikely, as the patient lacked any risk factors for endocardial injury such as severe mitral regurgitation, pacemaker insertion, or left atrial interventions for pulmonary vein isolation for atrial fibrillation. It is difficult to know with any degree of certainty what events might have occurred in this patient leading to such a rare presentation. There is no general consensus regarding treatment of such cases. The only currently available treatment is surgical removal of the vegetation.

Conclusions

We report the first case in the literature of vegetation attached to the interatrial septum located on the congenital site of the foramen ovale. We hope this case will remind physicians to look for vegetations in unusual places.

Conflict of interest

None.

References:

1. Ahmed I, Katz DH, Crooke GA et al: Biventricular mural vegetations in a patient without valvular pathology. J Am Soc Echocardiogr, 2006; 19(7): 938.e5–7
2. Jawad M, Cardozo S: RVOT mural and mitral valve endocarditis: A case report. Indian Heart J, 2015; 67(6): 595–97
3. Paraskevaidis IA, Michalakeas CA, Papadopoulos CH et al: Cardiac tumors. ISRN Oncology, 2011; 2011: 208929
4. Chen FC, Tseng YZ, Wu SP et al: Vegetation on patent foramen ovale presenting as a cryptogenic brain abscess. Int J Cardiol, 2008; 124(3): e49–50
5. Le Dolley Y, Thuny F, Bastard E et al: Pacemaker lead vegetation trapped in patent foramen ovale. a cause of hypoxemia after percutaneous extraction. Circulation, 2009; 119: e223–24
6. Cuervo G, Camoez M, Shaw E et al: Methicillin-resistant *Staphylococcus aureus* (MRSA) catheter-related bacteraemia in hemodialyses patients. BMC Infect Dis, 2015; 15: 484
7. Johri AM, Kovacs KA, Kafka HK: An unusual case of infective endocarditis: Extension of a tricuspid valve vegetation into the left atrium through a patent foramen ovale. Can J Cardiol, 2009; 25(7): 429–31
8. Turek MA, Karovitch A, Aaron SD, Brais M: Persistent hypoxemia occurring as a complication of tricuspid valve endocarditis. J Am Soc Echocardiogr, 2000; 13: 412–14