Infective Endocarditis of a Completely Endothelialized
CardioSEAL Patent Foramen Ovale Closure Device
— Extremely Rare Entity —

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H erein we present images of vegetation on a trans-
catheter-introduced cardioSEAL occluder device
used for patent foramen ovale (PFO) and which
had been implanted 11 years previously.
A 62-year-old man presented with fever, body ache, vision
change, and gait imbalance. His history was significant for
multiple transient ischemic attacks in the past and for PFO,
for which he underwent repair. Specifically, he had no history
of any immunosuppressive disease. His presentation elicited
concern with regard to another cerebrovascular accident.

Figure. (A) Transthoracic echocardiogram showing irregular thickening of the interatrial septum (IAS). (B) Transesophageal echocardiogram showing CardioSEAL device with vegetation at 96°, freely flowing in the left atrium. (C) 3-D Mid-esophageal short axis view at 55° and (D) modified bicaval view at 112° showing device and vegetation. (E) Intraoperative view of the device with multiple vegetation. (F) Device, vegetation and the pericardial patch used to cover the site, after extraction of the device. LA, left atrium; LV, left ventricle; RA, right atrium; RV, right ventricle; SVC, superior vena cava.

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Physical examination indicated normal heart sounds, no murmur, and focal neurological deficits as aforementioned. Computed tomography of the head did not show any evidence of hemorrhage. Magnetic resonance imaging showed no mass effect but multiple subacute infarcts bilaterally suggestive of embolic phenomena.

Transthoracic echocardiogram obtained as part of further work up, showed irregular thickening of the interatrial septum consistent with a history of atrial septal closure device with superimposed device-related vegetation (Figure A). Blood cultures were also positive and the final cultures grew β-hemolytic Streptococcus, group G. Given that infective endocarditis of the PFO occluder device was high on the differential diagnosis, transesophageal echocardiogram (TEE) was obtained. TEE showed a 1.7 × 1.3-cm globular mass along the superior edge of the PFO occluder device along the left atrial side, with abscess formation (Figure B). The mass had highly mobile attachments that floated within the left atrial cavity. The occluder device and vegetation were also clearly visualized on mid-esophageal short-axis view (Figure C) and modified bicaval view (Figure D). This vegetation was most likely derived from bacterial seeding after a dental procedure that he underwent approximately 6 weeks prior to presentation. The cardiothoracic surgery team further evaluated the patient and recommended a surgical approach. The patient first underwent left heart catheterization, which showed no coronary artery disease, followed by operative evaluation of the mass on the PFO occluder device (Figure E). On intraoperative visual evaluation, the device was found to be completely endothelialized.

The completely endothelialized infected PFO device was resected along with the vegetation, followed by pericardium patch septoplasty to seal off the defect (Figure F). Cultures of the vegetation also grew β-hemolytic Streptococcus, group G. The postoperative course was complicated by an occasional atrial arrhythmia for which he was started on metoprolol and amiodarone. He was continued on antibiotics for 3–4 weeks in total and was discharged in a stable position to the rehabilitation unit.

Infectious complications of PFO closure devices are extremely rare (especially if the device has been endothelialized well for a long time), and no cases of endocarditis of PFO CardioSEAL occluder devices placed ≥5 years previously were identified on extensive literature review. The present case highlights a very important point that physicians must remain open to the fact that even well-endothelialized PFO closure devices are susceptible to infectious endocarditis many years after placement. Early recognition of this complication may help prevent morbidity and mortality in this patient population.

**Disclosures**

The authors declare no conflicts of interest.

**Conflicts of Interest**

Nothing to report.

**References**