under cardiopulmonary bypass through a median sternotomy because the left atrial diverticulum was giant and thin.

References


Subacute Endocarditis of an Atrial Septal Closure Device in a Patient With a Patent Foramen Ovale

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The role of transcatheter closure of a patent foramen ovale for cryptogenic stroke remains controversial. The most common complications include atrial arrhythmia and bleeding. Infectious complications are exceedingly rare. We describe a 37-year-old man with a history of transient ischemic attacks and a patent foramen ovale who underwent transcatheter closure, complicated by subacute endocarditis of the completely endothelialized device 2 years after placement.


The treatment of patent foramen ovale (PFO) in patient with cryptogenic stroke remains controversial. There have been three multicenter prospective, randomized, controlled trials comparing transcatheter closure with medical therapy, and none has shown a benefit for transcatheter closure. As many as half of PFOs are incidental findings. Determining which patients show the most benefit for closure remains a challenge. Balancing the risks against this uncertain benefit remains a major challenge for clinicians and patients alike. Further studies are needed to clarify which patients will derive the greatest benefit.

A 37-year-old obese man with a history of poorly controlled type I diabetes mellitus, transient ischemic attacks, and transcatheter closure of a PFO in 2011 with an Amplatzer Septal Occluder (St. Jude Medical, St. Paul, MN), presented to the emergency department with diffuse chest pain, diaphoresis, and generalized malaise. After an emergent evaluation for an acute myocardial infarction, including coronary angiogram, was found to

Accepted for publication Dec 30, 2013.

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be negative, he was admitted for presumed pericarditis. He subsequently became febrile with blood cultures positive for methicillin-resistant Staphylococcus aureus (MRSA). His course was further complicated by pneumonia and development of a thoracic spine epidural abscess. One month earlier he had been hospitalized after presenting with malaise and low grade fevers and was treated for both pneumonia and a MRSA urinary tract infection. He had been feeling generally unwell since that hospitalization and had experienced a 20 kg weight loss. Given this recent history along with his transcatheter PFO closure, endocarditis was the presumptive diagnosis. The initial transthoracic echocardiogram was unrevealing; a transesophageal echocardiogram was performed and revealed a highly mobile, multilobulated vegetation on the left atrial aspect of his PFO closure device (Fig 1).

He was taken to the operating room and was found to have an intense inflammatory reaction with a thickened pericardium and a dense inflammatory peel along the entire epicardial surface of the heart. A right atriotomy revealed the device to be endothelialized on the right atrial side without vegetations (Fig 2). The left atrium was friable and thickened, and the device on this side, while epithelialized, had considerable vegetations (Fig 3). It was sharply debrided and excised. Upon removal, the inferior aspect of his atrial septum was debrided back to healthy tissue and closed with an autologous pericardial patch. Transesophageal echocardiography showed no residual flow across the atrial septum. Tissue cultures from the device and the pericardium grew MRSA. The patient’s initial recovery was uncomplicated, and he was discharged with 6 additional weeks of intravenous antibiotics. He presented 6 weeks later with a loculated right pleural effusion and underwent thoracoscopic decortication. His postoperative course was uneventful, and he was discharged home in good condition.

Comment

The first transcatheter closure of a PFO was in 1992 [1]. Since that time, with the development of new atrial septal occluder devices, transcatheter closure of PFOs in adults has increased substantially. Although the overall serious complication rate is approximately 15% to 20%, with atrial fibrillation and bleeding being the most common [2–4], infectious complications are exceedingly rare [5–10], and most of the reported cases are in patients who had a true atrial septal defect as opposed to a PFO. In the two reported patients with a PFO who had endocarditis, both had an atrial septal aneurysm, although with such a small number of cases, it is unknown whether that was contributory [8, 10].
Contrary to other reported cases, the device in this patient was completed endothelialized. The risk of complications such as thrombosis and infection is thought to be primarily related to the exposure of the prosthetic material and thus occurs either before endothelialization occurs or in poorly endothelialized devices [6–10]. This case highlights that infection is possible even with endothelialization, and thus represents a lifetime potential risk for these patients. 

Making the diagnosis of endocarditis in these patients can be challenging and frequently requires transesophageal echocardiography [8–10]. In this patient, endocarditis was suspected, but the initial transthoracic echocardiogram was negative. For patients with fever and prosthetic devices in which endocarditis is suspected, transesophageal echocardiography is likely the test of choice and should be performed expeditiously.

The role of transcatheter closure of a PFO in patients with cryptogenic stroke remains to be defined. There have been three multicenter prospective, randomized, controlled trials (CLOSURE I, PC, and RESPECT) comparing transcatheter closure with medical therapy; none of the trials demonstrated a benefit for transcatheter closure [2–4]. Better stratification and identification of patients in whom the PFO is the likely source of stroke is needed before the optimal means of treatment can be determined. The data suggest no benefit to closure over medical management; however, post hoc analysis from all three trials suggests that younger patients lacking other risk factors for stroke and patients with a large degree of shunt may derive a benefit.

Although infection is an uncommon complication of septal closure devices, its presence mimics the clinical course of an intravascular foreign body infection similar to prosthetic valve endocarditis and should be treated accordingly. It can occur late after device placement, and even in cases where the device is endothelialized. Thus, the risk of endocarditis is lifelong, similar to that for a prosthetic valve, and should be considered when placing these devices. For the patient presented here, this diagnosis was delayed for several months and even after endocarditis was suspected, the initial transthoracic echocardiogram was negative, suggesting that transesophageal echocardiography should be the test of choice in patients who have had atrial septal defect closure devices and in whom endocarditis is suspected. At the time of surgery, despite endothelialization, several large, friable vegetations were present. A high index of suspicion must be maintained in such patients.

References