Displacement of the Amplatzer occluder device from the mitral paraprosthetic leak

Shi-Min Yuan*, Amihay Shinfeld, Ehud Raanani

Department of Cardiac and Thoracic Surgery, The Chaim Sheba Medical Center, Tel Hashomer 52621, Israel

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Abstract

A critically ill patient had a major mitral paravalvular leak, failed device closure of the leak, and severe hemolytic anemia after a third mitral valve replacement. Echocardiography showed the Amplatzer occluder device completely displaced and swirled in the left atrial cavity. His condition was greatly improved after a fourth mitral valve replacement.

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1. Introduction

As an alternative to surgical treatment, percutaneous transcatheter closure technique is typically employed in the management of congenital heart defects including atrial or ventricular septal defect, patent ductus arteriosus, and ruptured sinus of Valsalva [1, 2]. The practice of transcatheter closure of the paravalvular leak was started in 1987, by using the double-umbrella device developed by Rashkind and Cuaso [3]. Displacement of the Amplatzer occluder device is a rare complication, which occurred in 0.9–2.4% of the interventionally treated population with a congenital heart defect [4–6]. Only one case of displacement of the Amplatzer occluder device was reported subsequent to percutaneous closure of mitral paravalvular leak [7].

2. Case report

A 65-year-old man, who had his third mitral valve replacement and subsequent paravalvular leak and failed device closure of the leak, recently developed severe hemolytic anemia, congestive heart failure, respiratory failure, renal failure, and klebsiella pneumonia bacteremia. He required prolonged ventilation through tracheostomy, multiple blood transfusion, and pacemaker for atrial fibrillation. He also had a history of diabetes, hypertension, ischemic heart disease, and glaucoma, etc. Laboratory tests (22 April 2008) showed that his hemoglobin was 8.7 g/dl (normal range, 14–18 g/dl), white blood cell count 22.94 K/µl (normal range, 4.8–10.8 K/µl), creatinine 2.81 mg/dl (normal range, 0.67–1.17 mg/dl), and lactate dehydrogenase 5133 U/l (normal range, 230–480 U/l). Echocardiography demonstrated mild wall motion abnormality, major mitral paravalvular leak, mild aortic valve stenosis, and mild tricuspid stenosis. Conservative treatments were not successful in improving his condition. He was referred to this department for surgical operation.

He was operated on under femorofemoral cardiopulmonary bypass on 4 June 2008. Preoperative echocardiography revealed a major posterior mitral paravalvular leak extending 0.8 cm in diameter, and the Amplatzer occluder device completely displaced and swirled in the left atrial cavity clockwisely (Fig. 1 and Videos 1 and 2). The left atrium was approached through the right atrium-atrial septum route. The tricuspid valve was regurgitant, the Amplatzer occluder device was located in the left atrium, and the mitral paravalvular leak was at the posterior portion. No signs of infection were noted in the mitral position. The Amplatzer occluder device was taken out (Fig. 2), and then the mitral valve was replaced with a 27 mm St. Jude Medical mechanical prosthesis (St. Jude Medical Inc., Minneapolis, MN, USA), and the tricuspid valve was repaired with a 32 mm Cosgrove–Edwards annuloplasty band (Edwards Lifesciences, Irvine, CA, USA). The cardiopulmonary bypass time was 228 min, and the cross-clamp time was 148 min.

The patient was hemodynamically stable and his condition was immediately improved after the operation. His hemoglobin was 9.5 g/dl, and his lactate dehydrogenase recovered to the normal limit. He was transferred to the Fifth Department of Internal Medicine for further convalescence on the 13th postoperative day.

3. Discussion

Paravalvular leak is a relatively common complication of heart valve replacement. It may cause cardiac dysfunction...
Fig. 1. Preoperative transesophageal echocardiography revealed a major mitral paravalvular leak (lower arrow), and the Amplatzer occluder device completely displaced and swirled in the left atrium clockwise (upper arrow).

Video 1. Intraoperative transesophageal echocardiography showing the Amplatzer occluder device completely displaced and swirled in the left atrium clockwise.

Video 2. Color Doppler imaging of intraoperative transesophageal echocardiography showed the Amplatzer occluder device completely displaced and swirled in the left atrium clockwise, and the major posterior mitral prosthetic leak.

and severe anemia, and lead the patient to a surgical intervention [8]. The advent of the transcatheter closure technique makes such patients with a high anticipated risk avoid redo operation [8]. Currently, Amplatzer occluder devices have been popularly accepted as a promising alternative to open heart surgery. However, significant residual regurgitation is sometimes noted, and repeated intervention is necessary [1]. The etiology of the residual paravalvular leak was primarily considered to be the irregular crescentric shape of the defect [1]. In the present patient, the suture dehiscence due to his poor conditions, including diabetes, may have been vulnerable to the paravalvular leak. Other complications of the occluder devices include arrhythmias, thromboembolism, device embolization, perforation, valve obstruction, and unstable position of the device [8].

Displacement of the Amplatzer occluder device is a rare complication of this interventional procedure. Only one case of occluder displacement after being deployed for mitral paravalvular leak was reported [7]. Size and location of the paravalvular leak, and presence of infection might be correlated with the stability of the occluder device. In addition, the device sitting on the atrial surface of the prosthesis was always moved by the eccentric regurgitant jet [7]. Such a complication requires surgical intervention to remove it from the intracardiac cavity or from the aorta [7, 9, 10]. Even though the present patient was critically ill and had developed a series of complications, surgical management seemed to be the only way for improving his condition.

References


