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CASE REPORT

Percutaneous retrieval of a dislodged Amplatzer septal occluder device from the pulmonary artery with sole use of a snare and device lassoing

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percutaneous retrieval;
snare

1. Introduction

Percutaneous closure of atrial septal defects (ASD) has become the standard of care for hemodynamically affected patients with communications of sizes up to about 35 mm in diameter, obviating surgery.[1,2] However, device dislodgement may occasionally occur after apparently successful initial placement.[3] This is a most serious complication that usually requires surgery for device removal. Here, we describe the case of a patient with such a complication, which was successfully managed with percutaneous retrieval of the embolized device with sole use of a snare that lassoed the device and obviated the use of additional tools and the need for surgery with their attendant cost and risks.

2. Case Report

A 66-year-old woman was belatedly diagnosed with a large secundum ASD after she had been complaining of dyspnea on exertion, fatigability, and migrainous headaches for a long time. A transthoracic and then a transesophageal echocardiogram (TEE) revealed an ASD of 24 mm diameter with left to right shunting and a Qp/s of 3:1 with right ventricular enlargement and mild pulmonary hypertension. During the initial procedure, the ASD diameter was calculated at 22.8 mm with the use of balloon sizing, and a 24-mm Amplatzer™ septal occluder (ASO) (St. Jude Medical, Inc., St. Paul, Minn, USA) was chosen for implantation. This

Abbreviations: ASD, atrial septal defect; ASO, Amplatzer septal occlude; TEE, transesophageal echocardiogram.

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was during our initial experience with the ASD closure program when we were not applying much oversizing in device selection. Although initially, there was apparent sealing of the defect and improvement in symptomatology, at the 6-month TEE re-evaluation, the patient showed residual left-to-right shunting, and the decision was made to implant a second device.

During the repeat procedure, the septum was crossed using a 0.035" guidewire aided with a multipurpose A1 6F catheter passing caudal to the previous ASO device (Fig. 1, panel A). The wire was landed at the left superior pulmonary vein, and over it, a 24-mm balloon was advanced through the defect for sizing (Fig. 1, panel B). The stretched diameter of the defect was 8 mm, and an ASO device of 10 mm was selected. The device (Fig. 1, panel C) was initially placed uneventfully under intracardiac echocardiography guidance, which indicated no residual left-to-right shunting. Contrast dye injection through the delivery catheter against the right side of the septum (Fig. 1, panel D) showed absence of right-to-left shunting, and the device was detached from the delivery system. The immediate post-procedural fluoroscopic view showed that the device had realigned after detachment but was still in apparently good and stable position (Fig. 1, panel E). Our routine has been to monitor the patient on the table in the laboratory for another 10-15 minutes and fluoroscopically re-confirm the position of the device. When this was done 15 minutes later, device migration was observed with the device having moved into the right pulmonary artery (Fig. 1, panel F). The patient had no symptoms at this point.

A decision was made to attempt to re-capture and extract the device by percutaneous means. Through the left femoral vein, an Amplatz GooseNeck® snare (eV3 Endovascular, Inc.; Covidien/Medtronic, Minneapolis, Minn, USA) with a 30-mm loop introduced into a 6F catheter was steered under fluoroscopy guidance into the right pulmonary artery beyond the position of the ASO device (Fig. 2, panel A). With tedious maneuvers, the snare loop was manipulated (Fig. 2, panel B), and it finally managed to capture the device at the screw of the right disk (Fig. 2, panel C) and pull it to the main pulmonary artery (Fig. 2, panel D). Re-arrangement of the loop was required at this stage due to device slippage, and after re-grasping the device (Fig. 2, panel E), this time at the waist of the device, the ASO was successfully pulled down to the iliofemoral vessels (Fig. 2, panel F) and finally extracted from the left groin area by using forceps to pave the way through the subcutaneous tissue. Because of a prolonged and complicated procedure, no attempt was made during this session to re-implant a larger device, and the patient was offered the option of a repeat percutaneous procedure or a surgical approach in the future. Three months later, the patient opted for elective surgery that was successfully carried out.

3. Discussion

Device dislodgement and embolization is a serious complication of percutaneous ASD device closure procedure, as it usually leads to emergency surgery for management with

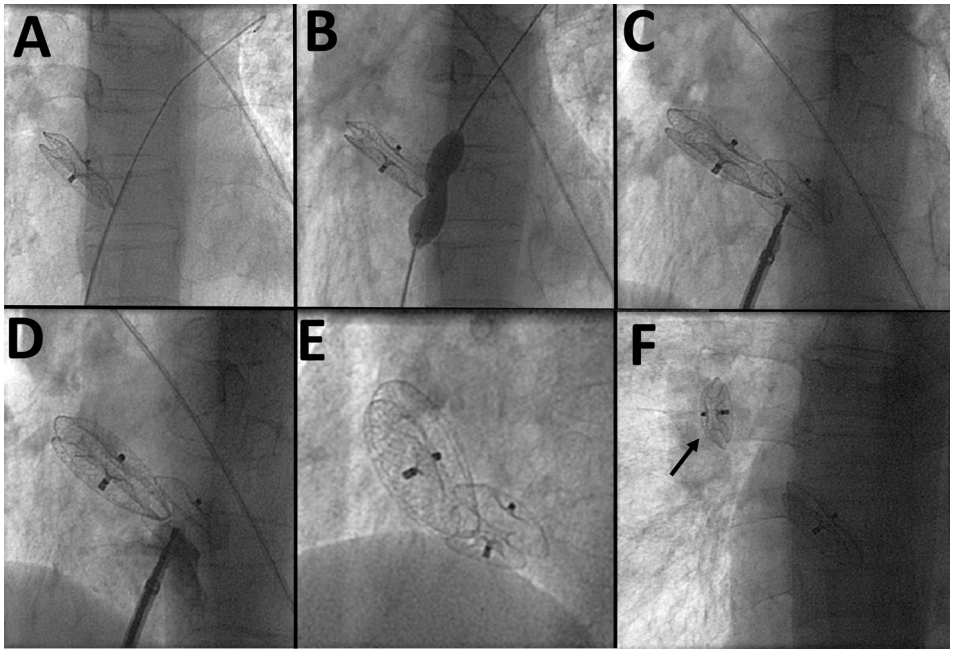

Figure 1 The steps of device placement are depicted with initial crossing of the residual defect with the guidewire (panel A), balloon sizing of the defect (panel B), device insertion and deployment across the septum (panel C), checking for right-to-left shunting with contrast injection (panel D), final deployment with detachment from the holding cable (panel E), and its embolization to the right pulmonary artery (panel F). See text for discussion.

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