Surgical retrieval of embolized atrial septum defect closure device from right pulmonary vein

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Abstract

A 69-year-old woman presented to the emergency department for symptoms of acute right heart failure including progressive exertional dyspnea and limbs weakness. She underwent percutaneous transcatheter closure of a secundum ASD through femoral vein eight months before. Transthoracic echocardiography (TTE) revealed severe tricuspid regurgitation and the migrated ASD device (Figure 1), we performed a safe procedure to retrieve the migrated device by deploying from a sheath. Postoperative vital signs were stable and the patient was discharged for home without symptoms of right heart failure. At the follow up one month later, TTE revealed no significant residual leaks at the ASD level, and no dyspnea or weakness was found.

KEYWORDS: Atrial septal defect;Device embolization;Surgical retrieval

1 — INTRODUCTION

Atrial septal defect (ASD) is the most common congenital heart disease. Percutaneous closure of ASDs has become increasingly common. Device embolization is one of the major complication. The device can be retrieved percutaneously when the event occurs some hours after deploy, surgical removal is necessary when the device was deployed for long time, it is diffifficult to remove the device without damage to the valvar apparatus. We herein performed a safe procedure to retrieve the migrated device by deploying from a sheath, which could minimize valve and conduction system complications.

2— CASE PRESENTATION

A 69-year-old woman presented to the emergency department for symptoms of acute right heart failure including progressive exertional dyspnea and limbs weakness. Physical examination showed slight cyanosis and cold limbs. She underwent percutaneous transcatheter closure of a secundum ASD through femoral vein eight months before. On further investigation, transthoracic echocardiography (TTE) revealed severe tricuspid regurgitation and the migrated ASD device (Figure 1), and the embolization seemed to be located near the left ventricular inflow tract. Computed tomography (CT) and three-dimensional reconstruction confirmed the left-side migration of the device, and revealed obstruction of RPV caused by the embolization (Figure 2). Given the clinical features and radiological findings, the diagnosis of ASD closure device migration was decided, and symptoms of heart failure were caused by RPV obstruction. In consideration of eight months after percutaneous closure, a safe surgical retrieval procedure reported by our center before was performed [1]. Standard median sternotomy and cardiopulmonary bypass were performed first, access was via right atrium. Then removed the endothelialized tissue around the device, and the A 3-0 prolene suture is placed through the middle

of the device. The suture is passed through a large (12F) soft plastic snugger which is advanced well into the atrium, and the ASD was closed surgically.

Postoperative vital signs were stable and the patient was discharged for home without symptoms of right heart failure. At the follow up one month later, TTE revealed no significant residual leaks at the ASD level, and no dyspnea or weakness was found.

3—DISCUSSION

Many complications such as deice embolization, erosion, bleeding, arrhythmias, infection, air embolism and thromboembolism have been reported in previous studies [2,3], embolization has the highest incidence rate among all complications.The major time of embolization is reported in the first 24h, and the most common sites are the main or branched pulmonary artery and atrioventricular valve, rarely migrate to the left side.However, several weeks or months after deployment, because of endothelialization, device is firmly fixed in the tissue, there is little chance for device to migrate. On the other hand, once these devices of endothelial happen to migrate, retrieving the embolization percutaneously is hard and dangerous. Surgical retrieval could be selected and done with less risks and better results when failing or hard to retrieve percutaneously. Techniques such as direct retrieval and using two forceps to fold the device have been reported [4]. In this case, we performed a safe procedure to retrieve the migrated device by deploying from a sheath (Figure 3), which could minimize valve and conduction system complications.

4—CONCLUSION

This technique provides a safe and reproducible method for surgical removal of an embolized ASD closure device several weeks or months after deployment .

AUTHOR CONTRIBUTIONS

All authors were involved in the conception and design, critical revision, manuscript writing, final approval, and agreed to be accountable for all aspects of the work.

FUNDING INFORMATION

No funding was required in the preparation of this case report.

DATA AVAILABILITY STATEMENT

All data generated or analyzed during this study are included in this published article.

ETHICS STATEMENT

This study is in compliance with the declaration of Helsinki.

CONSENT

Written informed consent was obtained from the patient for publication of this case report in accordance with the journal's patient consent policy.

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Figures

Figure 1. Transthoracic echocardiography revealed tricuspid regurgitation and malposition of the device. (RA= right atrium, RV= right ventricle, TV= tricuspid valve, D= device)

Figure 2. Three-dimensional reconstruction demonstrated right pulmonary vein obstruction caused by migrated device. (The green object is device; D= device, RPV= right pulmonary vein)

Figure 3 Retrieval of ASD closure device into a soft plastic snugger to facilitate safe removal from the left atrium.