Images in
Cardiovascular Medicine

Percutaneous Transcatheter Closure of Iatrogenic Aorto-right Atrial Fistula Using the Amplatzer Duct Occluder

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A 59-year-old woman was admitted for dyspnea on exertion to receive percutaneous mitral valvuloplasty due to moderate to severe mitral stenosis. An iatrogenic injury of ascending aorta by SL1 sheath occurred during a trans-septal puncture. The angiographic finding identified it was located in the ascending aorta (**Supplementary Video 1**). She received emergent operation immediately to repair the iatrogenic fistula and severe mitral stenosis in our center. She received mitral valve replacement well but the injury site of ascending aorta was too small to find in the surgical field.

Echocardiographic images demonstrated a fistula between the non-coronary sinus of valsalva and the right atrium (RA) with continuous shunt flow (**Figure 1A**). Twelve days after operation, we performed percutaneous trans-catheter device closure for the iatrogenic fistula. At first, guidewire was passed through the fistula antegradely—ascending aorta to RA (**Supplementary Video 2**). Aortogram showed left to right shunt flow from the fistula. After externalization of wire to right femoral vein (**Supplementary Video 3**), the 5×4 mm sized of Amplatzer Duct Occluder I was implanted from right femoral venous route to RA to ascending aorta. Prior to final deployment of the device, no aortic regurgitation was confirmed by transthoracic echocardiography and there was no disturbance of right coronary flow. After deployment, device was stabilized in the fistula and there was no residual flow through the fistula. Follow-up transesophageal echocardiography showed device was well-located in the fistula (**Figure 1B**, **Figure 2**). The trans-catheter device closure was done successfully, showing that the percutaneous approach may be an efficient and safe treatment option. The Institutional Review Board of Daejeon St. Mary's Hospital approved this study and the patient's informed consent was waived (IRB number: DC21ZASI0054).

Conflict of Interest

The authors have no financial conflicts of interest.

Data Sharing Statement

The data generated in this study is available from the corresponding authors upon reasonable request.

Author Contributions

Conceptualization: Lee K, Her SH; Data curation: Lee K; Formal analysis: Her SH; Investigation: Lee K, Her SH; Resources: Lee K, Cho JS, Kim TS, Kwon J; Supervision: Cho JS, Kim TS, Her SH; Visualization: Cho JS; Writing - original draft: Lee K; Writing - review & editing: Lee K, Kim TS, Kwon J, Her SH.

Figure 1. The 2D TEE image of iatrogenic aorto-right atrial fistula before and after device closure. (A) In the 2D TEE image of iatrogenic aorto-right atrial fistula, continuous shunt flow (of which color Doppler velocity was up to 4 m/sec) from aorta to right atrium was observed. (B) The 2D TEE image after device closure using Amplatzer Duct Occluder (white arrow).

TEE = transesophageal echocardiography; 2D = 2-dimensional.

SUPPLEMENTARY MATERIALS

Supplementary Video 1

Iatrogenic injury to aorta during trans-septal puncture.

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Figure 2. The 3D TEE image of before and after device closure. (A) The 3D TEE image before device closure; blunt arrow represented the iatrogenic fistula. (B) The 3D TEE image after device closure with Amplatzer Duct Occluder, (5×4 mm); narrow arrow indicated device which was deployed in the fistula. TEE = transesophageal echocardiography; 3D = 3-dimensional.

Supplementary Video 2

Antegrade wiring from ascending aorta to right atrium.

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Supplementary Video 3

Snaring of wire for externalization.

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