A rare type of left atrial dissection

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Left atrial dissection after mitral valve repair is a rare complication, and transesophageal echocardiography (TEE) is reported to be decisive for its diagnosis.¹⁻⁴ We encountered an unreported type of left atrial dissection after mitral valve replacement and the maze procedure, which had a delayed onset, located mainly in the anterior side of the left atrium, and was spontaneously cured without surgical treatment.

Clinical Summary

A 64-year-old man with severe mitral regurgitation (MR), atrial fibrillation, and renal dysfunction underwent the operation in July 2001. After cardiopulmonary bypass was instituted and cardioplegic arrest was obtained, the right side of the left atrium was incised. The cause of MR was the prolapse of the anterior mitral leaflet caused by severe degeneration. First, a modified maze procedure was conducted with cryoablation. The anterior leaflet was then resected, and a bioprosthesis (31-mm Carpentier-Edwards pericardial valve; Edwards Lifesciences, Irvine, Calif) was smoothly implanted with 13 stitches. Routine intraoperative TEE showed no abnormal findings. The postoperative hemodynamics was stable, and the patient was extubated the next morning. Although transthoracic echocardiography conducted on postoperative day (POD) 9 revealed no MR, the entire left atrium could not be examined clearly from the chest wall.

The patient was readmitted to our hospital on POD 46 as a result of pulmonary edema. The main cause of the congestion was deteriorated renal function and irregular taking of diuretics, and the congestion improved with proper medication. For the evaluation of cardiac function, TEE was conducted on POD 47, and it accidentally showed an abnormal cavity in the left atrium. The cavity occupied the anterior half of the left atrium, extended to the mitral valve anulus and the left atrial appendage, and contained gel-like fluid that showed heterogeneous echocardiographic and no flow signals (Figure 1, A and B). We diagnosed it as left atrial dissection. Although the left atrial cavity was compressed by the dissected lumen, the patient's hemodynamic status was stable. Therefore, we treated the dissection conservatively. The follow-up TEE on POD 52 showed the content of the dissected cavity had coagulated (Figure 1, C), and TEE on POD 61 showed the volume of the coagulated mass had diminished (Figure 1, D). The patient was discharged from the hospital and is doing well 6 months postoperatively.

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Figure 1. TEE on POD 47 showed a dissecting lumen (DL) located in the anterior portion of the left atrium (A) and extending to the left atrial appendage (B). The content of the DL had coagulated by POD 52 (C), and its volume had diminished on POD 61 (D). LA, Left atrium; LAA, left atrial appendage; MV, mitral valve; AV, aortic valve; LV, left ventricle; RA, right atrium.

Discussion

Left atrial dissection is a rare complication after mitral valve repair, and the literature reveals only several cases.¹⁻⁵ Dissection occurred just after the operation, POD 3 at the latest, in all the previous cases, and all required surgical treatment. The main site of dissection was the posterior wall of the left atrium in most cases. Although one case⁴ had an interatrial-septal dissection as well, the main dissected lumen demonstrated with TEE also seemed to be located in the posterior wall of the left atrium.

In our case, on the contrary, the onset was rather late, between POD 9 and POD 47, and the dissection did not severely affect the hemodynamics, requiring no surgical treatment. We speculated that it was because the dissected lumen had an extremely small

communication to the left ventricle. In addition, the dissection in our case was located in the anterior wall of the left atrium, including the interatrial septum, the anterior mitral annulus, and the left atrial appendage, with the posterior wall of the left atrium being left intact. This type of left atrial dissection has not been reported. Although the most common cause of left atrial dissection is surgical damage to the posterior mitral annulus,^{1,3-5} one probable cause of the dissection in our case was minor surgical damage near the anterior mitral annulus, considering the anterior localization of the dissection and complete preservation of the posterior mitral leaflet during the operation.

There is no report describing left atrial dissection after the maze procedure, and it is unclear how the maze procedure conducted in

our case affected the left atrial dissection. It is possible that surgical procedures in the left atrium, such as atriotomy, cryoablation, or plication of the appendage, damaged small vessels in the atrial wall, gradually making a large hematoma in the left atrial wall.

Two different types of surgical treatment for left atrial dissection, namely entry closure^{1,4,5} and internal drainage,^{2,3} have been reported. In our case, although the dissected lumen was large and the left atrial cavity was compressed, there was no blood flow in the dissected lumen, and the patient's hemodynamics were stable under proper medication. Therefore, we treated the dissection conservatively, and it was spontaneously cured. This was thought to be one variation of the natural courses of left atrial dissection, which has not yet been reported.

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