

Avulsion of pledgeted sutures with traumatic aortic regurgitation 15 years after papillary muscle relocation



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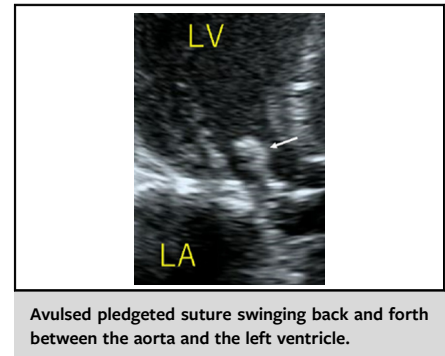
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Papillary muscle (PM) relocation is a subvalvular procedure in mitral valve repair (MVR) to treat ischemic mitral regurgitation (MR).

CASE REPORT

A 69-year-old woman had previously undergone percutaneous coronary intervention for acute myocardial ischemia of the left circumflex artery. Seven days later, she underwent MVR and coronary artery bypass grafting for ischemic MR. Coronary artery bypass grafting was achieved using the left internal mammary artery to the left anterior descending coronary artery and saphenous vein grafts to the first diagonal branch and the right coronary artery. MVR was performed with mitral annuloplasty using a 26-mm Carpentier-Edwards Classic annuloplasty ring (Edwards Lifesciences) and relocation of the anterolateral and posteromedial PMs to the annulus of the anterior mitral leaflet, using a polytetrafluoroethylene (PTFE) suture (CV-4 Gore-Tex; WL Gore & Associates Inc). Written informed consent was obtained from the patient for publication of study data (institutional review board #1078, February 16, 2023).

Fifteen years later, during the annual follow-up, transthoracic and transesophageal echocardiography revealed a mobile mass (21 × 12 mm) near the aortic valve that swung back and forth between the ascending aorta and the left ventricle, passing between the left coronary and noncoronary cusp (Figure 1). Echocardiography also revealed a left ventricular ejection fraction of 42%, unchanged severe hypokinesis at the posterior and inferior walls, new moderate aortic regurgitation (AR), and new mild MR. In addition, an AR jet was observed at the same site as the mobile mass. The echocardiography conducted 1 year



CENTRAL MESSAGE

Traumatic aortic regurgitation resulting from the avulsion of pledgeted sutures following papillary muscle relocation requires careful attention.

earlier had revealed trivial AR without the mass and no MR. The patient did not present any symptoms suggesting heart failure or arterial embolisms. Coronary computed tomography angiography showed no new lesions in any graft or coronary artery, whereas enhanced computed tomography of the head and whole body demonstrated the absence of stroke and embolism. Therefore, a calcified amorphous tumor was suspected, and surgical intervention was planned.

The patient underwent surgery 8 days after the initial diagnosis through a re sternotomy. Intraoperative transesophageal echocardiography showed severe AR that was worse than what was observed preoperatively. Under cardiopulmonary bypass with moderate hypothermia, a mass was identified above the aortic valve, which was connected to the annulus of the anterior mitral leaflet with sutures. The mass was composed of avulsed pledgets and PTFE sutures that had been used for posteromedial PM relocation in the previous surgery and was coated with whitish tissue. We resected the sutures near the annulus (Figure 2, A) and performed aortic valve replacement using a 19-mm Inspiris Resilia (Edwards Lifesciences). The aortic valve had not been well coapted due to prolapse of the deformed left coronary and noncoronary cusps (Figure 2, B).

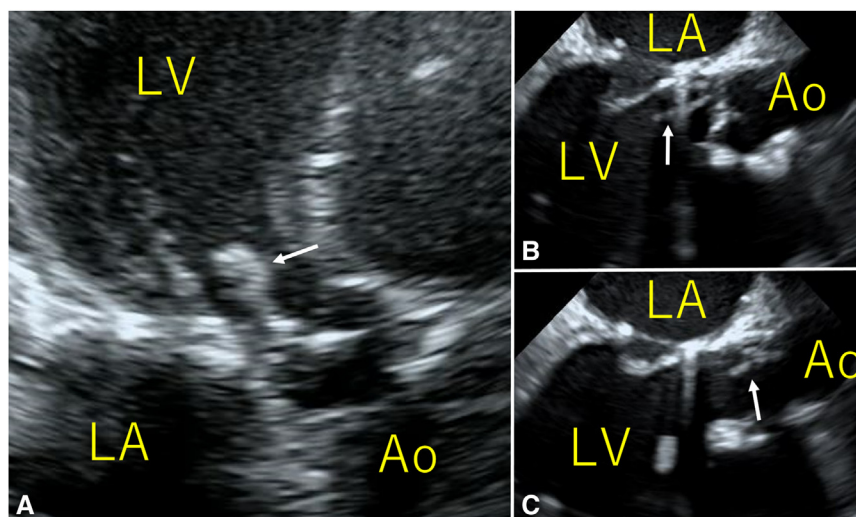


FIGURE 1. A, Transthoracic echocardiography and transesophageal echocardiography at (B) at diastolic and (C) systolic phase showing the mobile mass (21 × 12 mm) (white arrow) near the aortic valve, swinging back and forth between the ascending aorta and the left ventricle. LV, Left ventricle; LA, left atrium; Ao, aorta.



FIGURE 2. A, Resected mass connected with surgical suture during the surgery. B, Resected left (L), right (R), and noncoronary (N) cusp of the aortic valve during the surgery. There is deformation in a part of left and noncoronary cusp (white arrows).

The postoperative course was uneventful. Echocardiography revealed normal function of the aortic prosthetic valve and mild MR. Pathologic examination of the resected mass showed sutures with pledgets coated with a fibrous tissue capsule without PM tissue.

DISCUSSION

Valvular masses are very rare, accounting for approximately 0.32% of adult cardiac operations.¹ The main causes of these lesions include papillary fibroelastomas, myxomas, thrombi, calcification, and calcified amorphous tumor.¹

In recent years, subvalvular repair techniques have been widely considered as a supplement to ring annuloplasty for ischemic MR due to the high recurrence rate of MR after isolated mitral annuloplasty (up to 20%-30%).² Micali and colleagues³ reported that PM interventions in combination with ring annuloplasty reduced the incidence of MR recurrence compared with isolated ring annuloplasty. Furthermore, they found that PM relocation was more effective than PM approximation in controlling MR recurrence.³

There are very few reports on aortic valve injuries caused by valvular masses. In our case, we observed rapidly progressive AR aggravation at the same site where the avulsed suture had passed. We suspect that repeated collisions of the mass with the left and noncoronary cusps resulted in the deformation and prolapse of the latter. Obase and colleagues⁴ described a case of AR resulting from a traumatic leaflet tear due to a calcified amorphous tumor. In their case, the tumor from the noncoronary cusp directly injured the leaflet edge, causing a torn-free margin of the noncoronary cusp.

Although PTFE sutures are often employed in MVR, there have been reports of artificial chordae failure, with suture rupture being the most frequent cause of nonsuccess, followed by fibrosis, calcification, and sclerosis.⁵ However, avulsion of sutures as a late-onset complication of PM relocation has not been reported. In our patient, there was only a slight deterioration in MR after avulsion. Although it is unlikely that PTFE sutures were directly associated with controlling MR, and the suture used for anterolateral PM relocation remained intact, caution should be exercised regarding MR recurrence in the future.

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