

Late Chronic Tamponade after Intraoperative Right Ventricular Rupture Repair with Mediastinal Fat

Javier Gualis¹ Mario Castaño¹ Miguel Angel Rodríguez¹ Cristina García¹

¹Department of Cardiac Surgery, Complejo Asistencial Universitario de León, León, Spain

Address for correspondence Javier Gualis, MD, PhD, Complejo Asistencial Universitario de León, Altos de Nava s/n, León 24007, Spain (e-mail: javgua@hotmail.com).

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Abstract

Advanced age and female sex are known risk factors for ventricular wall rupture during open-heart procedures. We present the case of an 83-year-old female patient with an intraoperative traumatic right ventricular free wall rupture during an aortic valve replacement procedure. Pledged interrupted sutures reinforced with large pieces of mediastinal fat were used for rupture repair. After 6 months, the patient was readmitted with the diagnosis of a retrosternal mediastinal mass and clinical signs of cardiac tamponade that required reoperation.

Keywords

- ▶ tamponade
- ▶ elderly
- ▶ complications

Case Report

An 83-year-old female patient with history of dyslipemia, hypertension, and chronic renal failure presented with the New York Heart Association functional class III dyspnea and was admitted in our department with the diagnosis of symptomatic severe aortic stenosis. An aortic valve replacement through a J-shaped ministernotomy was scheduled. During the procedure, accidental excessive traction of an epicardial temporal pacemaker lead caused a right ventricular (RV) free wall tear with significant bleeding. Several interrupted pledged sutures were used for RV repair and large pieces of mediastinal fat were included between the suture Teflon felts for suture reinforcement of an extremely fragile RV tissue. After bleeding control, a bovine pericardial patch was used to cover the defect and for pericardial closure beneath the sternum. The postoperative course was uneventful and the patient was discharged on the 7th postoperative day. After 6 months of follow-up the patient was readmitted with congestive heart failure symptoms and multiple Valsalva-induced syncope. Increased jugular venous pressure, paradoxical pulse, a high-pitched holosystolic apical murmur, and mild hepatomegaly were found at physical examination. Transthoracic echocardiography revealed a retrosternal mass that significantly compressed the RV anterior wall, echocardiographic signs of intrapericardial pressure increase, and left displacement of the interventricular septum that induced a systolic anterior motion of the mitral valve anterior leaflet and

a significant subaortic gradient. A magnetic resonance imaging (MRI) was performed and a well-defined retrosternal intra-pericardial mass was found compressing the free wall of the right ventricle. It had a heterogenous signal intensity with some hyperintensive areas in T1 (▶ Fig. 1A) and T2-weighted images (▶ Fig. 1B) and low attenuation in the computed tomography scan images (▶ Fig. 1C). These areas were suppressed with a short time inversion recovery (STIR) sequence, suggesting the presence of fatty tissue in the mass (▶ Fig. 1D). After repeated full sternotomy, a big cystic yellowish heterogenous effusion was found between the posterior sternal aspect and the RV anterior wall (▶ Fig. 2A), covered by the bovine pericardial patch (▶ Fig. 2B). Despite the MRI findings, no intact fat tissue was found. Both the effusion and the pericardial patch were easily removed with complete RV free wall reexpansion and decompression. The postoperative course was uneventful, and the patient was discharged on the 5th postoperative day. Fluid cultures were negative. After 3 months of the operation the patient remains asymptomatic and with no subaortic stenosis on echocardiography.

Discussion

Advanced age and female sex are known risk factors for ventricular wall rupture during open-heart procedures.^{1,2} RV free wall is usually an extremely friable tissue, especially when the myocardium is completely covered by epicardial fat. In these

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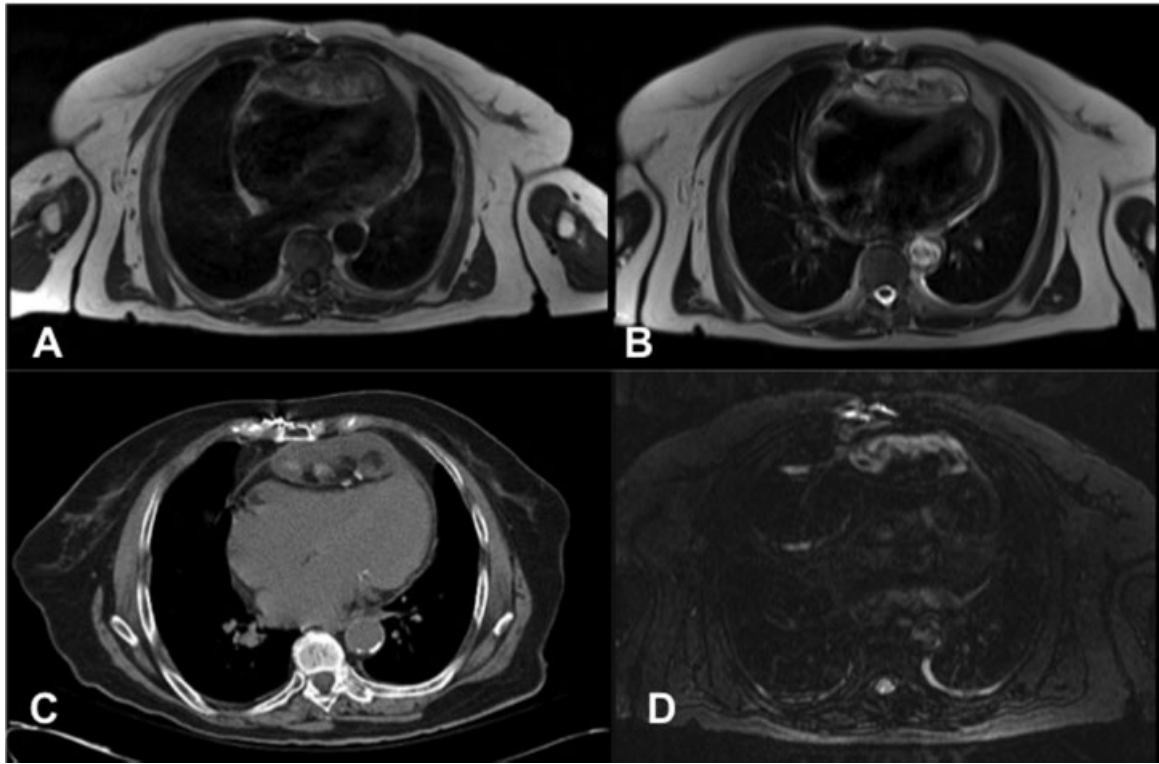


Fig. 1 (A) MRI T1 sequence, (B) MRI T2 sequence, (C) CT scan image, and (D) MRI STIR sequence. CT, computed tomography; MRI, magnetic resonance imaging; STIR, short time inversion recovery.

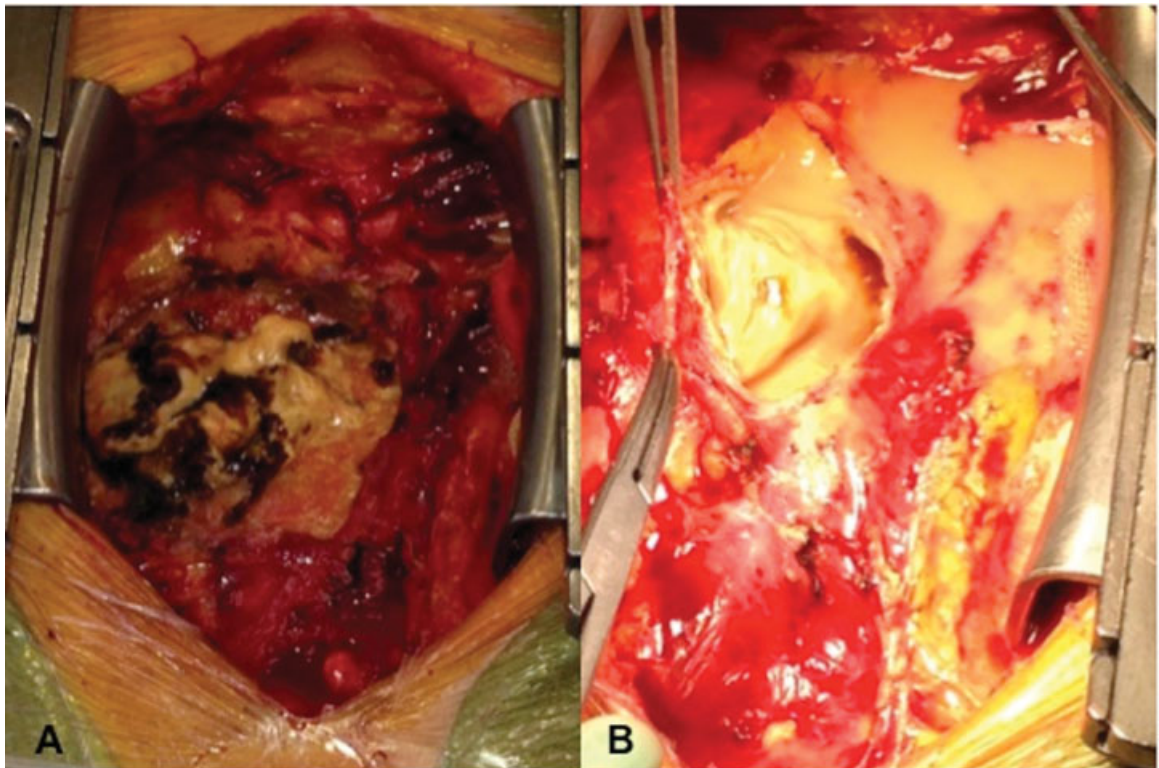


Fig. 2 Intraoperative image (A) mass compressing the free wall of right ventricle and (B) cystic heterogeneous effusion.

cases, both heart manipulation and suture or device implantation must be carefully performed to avoid myocardial tear and massive/refractory bleeding.¹⁻³ A myriad of surgical techniques for myocardial tear repair have been described in this and other locations.^{4,5} Mediastinal fat is an autologous and widely available material with optimal tissue adaptability when embedded in pledgetted sutures. Autologous fat has been extensively and successfully used in our department to reinforce additional hemostatic stitches when bleeding from a fragile tissue, such as a dissected aorta, a severely dilated right atrium or, as in this case, a RV free wall in an elderly female patient, becomes a serious complication. In our case, large pieces of fat melted with retained clotted blood probably resulted in a caseous necrotic mixture that persisted over time and, finally, compressed the right ventricle when preloading conditions were surpassed by increasing intrapericardial pressures.

In conclusion, we think that mediastinal fat is an useful hemostatic adjuvant, but it must be used with caution and as small pledgets in nonexpandable anatomic locations in which increasing volume could result in compression of susceptible vital structures or vessels, such as the RV anterior free wall, coronary artery bypass grafts, or reimplanted coronary ostia.

Disclosures

None.

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