Successful Mitral Valve Repair and Ring Annuloplasty In A Case With Giant Left Atrial Thrombus

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Abstract

Left atrial ball thrombus appears to be uncommon. Ball thrombi of the left atrium are usually observed with mitral valve disease. In this study, we report a case of successful mitral valve repair and ring annuloplasty in a case with giant left atrial thrombus. Removal of the ball thrombus and mitral valve repair were performed simultaneously. Early diagnosis and emergent surgical intervention are mandatory for giant left atrial thrombus.

INTRODUCTION

A ball thrombus in the left atrium is a rare clinical problem with catastrophic complications. The aim of mitral valve repair is to obtain a component mitral valve with the largest possible orifice and this repair represents a better alternative than valve replacement, as previously described, in terms of a higher survival rate and a significant reduction in mitral valve-related complications (1, 2). Left atrial appendage obliteration is a strategy for stroke prophylaxis in atrial fibrillation.

CASE PRESENTATION

A 37-year-old woman presented with complaint of dyspnea. She experienced neither embolism nor syncope. ECG showed atrial fibrillation rhythm. By echocardiography, the mass in the dilated left atrium (54mm) was appeared to be a heterogeneous ball thrombus, and the patient was diagnosed to be severe mitral valve stenosis (mitral valve area was 1.3cm²) and mild tricuspid regurgitation. Transthoracic echocardiography revealed normal left ventricular dimension and function (ejection fraction was 60%) and left atrial dilatation (54mm). Pulmonary arterial pressure was 50/22 mmHg. Transthoracic color-flow Doppler echocardiography revealed an echogenic large (giant) left atrial mass diagnosed as a organized left atrial lateral mural thrombus in the dilated left atrium with the diameters of 4.8x3.2cm (Figure 1).

It was heterogeneous. An urgent operation was performed. She was operated under endotracheal general anesthesia and in supine position. Following a median sternotomy, pericard was opened longitudinally. After heparinization, extracorporeal circulation was established between the venae cavae and the ascending aorta. A cross clamp was placed on aorta and by antegrade intermittent isothermic blood cardioplegy from aortic root, cardiac arrest was established. Hypothermia was moderate (28ºc). Standart left atriotomy was made from interatrial junction. The mitral valve is approached via a standart left atriotomy parallel to the interatrial sulcus. Cooley’s retractor is positioned for
optimal exposure. Under the extracorporeal circulation, the ball thrombus, 60 X 50 mm in size, was removed (Figures 2 & 3).

**Figure 2**

Figure 2

Left auriculopexy was performed with primary sutures of 3/0 monofilament polypropylene from left atrium. The entire valvular apparatus was carefully examined in order to assess the feasibility of reconstructive surgery and to plan the operative technique. The valvular apparatus was then mobilized as an entire unit with a nerve hook in order to assess tissue flexibility and to identify leaflet restriction. There wasn’t any tissue loss. The bilateral commissures were incised while leaving intact one millimeter of valvular tissue as in the normal anatomy. The underlying chordae and papillary muscles were then incised accordingly. After this step we performed bilateral segmental annuloplasty. This procedure may also be used to achieve better approximation of leaflet tissue with the placement of mattress stitches at the commissures. We tested the valve competence after this step on observing valve closure while the left ventricular cavity is filled with saline solution. There wasn’t saline regurgitation. From a surgical point of view, a flexible ring reduces the tension of the sutures, decreasing the likelihood of ring dehiscence. The ring can also be split. This is particularly useful in those cases in which the surgeon doubts the quality of the repair. For these reasons we performed mitral ring annuloplasty with SN 50067512 SJM annuloplasty flexible ring TARP-31mm. We re-tested the valve competence after this step on observing valve closure with saline solution. Valve competence and closure were excellent (Figure 4). Left atriotomy closed standardly.

**Figure 4**

Figure 4

On pathologic examination the mass was diagnosed as an organized thrombus.
She was no required inotropic support during weaning from cardiopulmonary bypass and early postoperative period. She was extubated after an intubation duration 7 hours and stayed in the intensive care for 2 days. The hospital stay was 7 days. Postoperatively at the discharge day and after 2 months an echocardiographic investigation was revealed minimal nonsignificant regurgitation for the repaired mitral valve. The functional capacity of our patient improved dramatically.

**DISCUSSION**

During thrombus development and subsequent morphologic changes, it is very likely that the patient may experience transient embolisms or strokes(3,4). In the total population, cerebrovascular ischemic diseases account for 0.2-0.3% cases per year, and in the 20-40% of them it is possible to recognize a cardioembolic mechanism(5).

Many recent reports have demonstrated that TEE not only improves the recognition of known cardioembolic diseases (intracardiac thrombi, mitral stenosis, valvular prosthesis thrombosis, endocardial infectious diseases), but is also the most reliable non invasive technique suitable to detect atherosclerotic lesions of the ascending aorta(5).

Mitral stenosis is the most frequently encountered valvular pathology and may require surgical intervention when the lesion is severe. Surgical technique commonly involves valve replacement with a metallic or biological prosthesis, but valve sparing techniques with chordal preservation or partial leaflet resection are becoming more widespread(6). Since 1970s, reconstructive surgery of the mitral valve was implanted definitively after the pioneering work of Carpentier(7). Since then, clinical experience has shown that this conservative surgery involves minor hospital mortality and more satisfactory long-term clinical results(8). The object of the annuloplasty is: to correct the annular dilatation; to increase free edge coaptation; to reinforce the annulus after a leaflet resection procedure; and to prevent further annular dilatation. Flexible ring annuloplasties were introduced based on the principles of mitral valve reconstruction introduced by Carpentier, particularly after the discovery of the three-dimensional continuous movements of the valve annulus. A completely flexible ring reduces the abnormally dilated annulus, allowing the three-dimensional configuration of the mitral valve and was thought to be advantageous that the ring followed the changes of size and shape of the atrioventricular anulus in a physiological manner(7-9).

In conclusion; the diagnosis of a ball thrombus of the left atrium should lead to urgent surgery because of the high risk of haemodynamic and embolic complications(10). Mitral valve reconstructive surgery with flexible ring annuloplasty entails a low hospital mortality with satisfactory long-term clinical results, actuarial freedom from reoperation and it allows improvement of left ventricular function.

**References**

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