Mitral valve repair in a case with very large giant left atrial organised thrombus

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Citation

Abstract
Large left atrial mural thrombus is usually observed with mitral valve disease. This mass has risks of sudden circulatory collapse and systemic embolization. The aim of mitral valve repair is to obtain a component mitral valve with the largest possible nonstenotic orifice and this repair represents a better alternative than valve replacement. In this study, we report a patient in whom a very large and organised thrombus in the left atrium with mitral valve stenosis and our successful surgical removal therapy. We considered the emergent surgery for the large left atrial mural thrombus. This approach at the time is the best treatment option. Mitral valve repair is now clearly established that restoration of a normal mitral valve function with reconstructive surgery is preferable to replacement with a device, whether bioprosthetic or mechanical.

INTRODUCTION
Left atrial ball-shaped masses may be thrombi, vegetations or tumor. Most of left atrial (LA) thrombus were complicated with mitral stenosis. The diagnosis of a left atrial thrombus ball should be regarded as an urgent indication for preventive surgery[1]. 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[2,3].

CASE PRESENTATION
A 62-year-old woman presented with complaint of mild dyspnea and increasing fatigue. She experienced neither embolism nor syncope. ECG showed atrial fibrillation rhythm. Bidimensional transthoracic echocardiography revealed normal left ventricular dimension and function (ejection fraction was 70%) and left atrial dilatation (69mm). Pulmonary arterial pressure was 40/19 mmHg. Transthoracic echocardiography (TTE) showed severe mitral stenosis (mitral valve area was 1.63cm²), mild tricuspid and mitral regurgitation. Transthoracic color-flow Doppler echocardiography revealed an echogenic large (giant) left atrial mass diagnosed as a organized left atrial mural thrombus in the dilated left atrium with the diameters of 6.5x4cm (Figures 1&2).
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Figure 2
Figure 2

It was compact, homogeneous and stationary. Transesophageal echocardiography showed similar findings. Her cardiac coronary arteriography (CAG) and cardiac catheterization were performed. It was confirmed that EF: 70%. Coronary arteries were normal.

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, extra-corporeal circulation is established between the venae cavae and the ascending aorta. A cross clamp was placed on aorta and by antegrad intermittent isothermic blood cardioplegy from aortic root, cardiac arrest was established. Hypothermia was moderate (28ºC). A vent was placed via the right superior pulmonary vein. Standard left atriotomy was made from interatrial junction. Under the extracorporeal circulation, the ball thrombus, 50 X 70 mm in size, was removed (Figures 3 & 4). Its cut surfaces showed a laminated structure.

Left auriculopexi was performed with primary sutures of 3/0 monofilament polypropylene from left atrium (Figure 5).

Figure 3
Figure 3

Figure 4
Figure 4
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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. Some fibrocalcific areas near the free edge of anterior leaflet were seen there wasn’t any tissue loss. It could cover whole mitral orifice there wasn’t commisural fusion. The bilateral comissures 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 (Figure 6).

Valve competence and closure were excellent. Left atriotomy closed standardly. On pathologic examination the mass was diagnosed as an organized thrombus (Figure 9).

This procedure may also be used to achieve better approximation of leaflet tissue with the placement of mattress stitches at the comissures. 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 (Figures 7&8).
She did not require inotropic support during weaning from cardiopulmonary bypass and early postoperative period. The postoperative course was uneventful. The functional capacity of our patient improved dramatically.

**DISCUSSION**

Left atrial ball thrombus in the mitral valve disease has been reported frequently. It gradually enlarges and forms projecting mass that remains attached to the atrial wall by a pedicle. During thrombus development and subsequent morphologic changes, it is very likely that the patient may experience transient embolisms or strokes. Distal embolization subsequent to fragmentation is believed to be the cause of cerebrovascular accident or potential loss of a limb.

Transthoracic and transesophageal echocardiography are the procedures of choice for the diagnosis of cardiac mass involving left atrium.

Mitral stenosis is the most frequently encountered valvular pathology and may require surgical intervention when the lesion is severe. Since 1970s, reconstructive surgery of the mitral valve was implanted definitively after the pioneering work of Carpentier. Since then, clinical experience has shown that this conservative surgery involves minor hospital mortality and more satisfactory long-term clinical results. Surgical techniques are evolving continuously and making it possible to treat lesions that we previously thought were beyond repair. Mitral valve reconstructive surgery entails a low hospital mortality with satisfactory long-term clinical results, actuarial freedom from reoperation and it allows improvement of left ventricular function.

Some form of intraoperative assessment and direct observation for evaluating the mitral closing mechanism is mandatory. Intraoperative transesophageal two-dimensional color echocardiography is an extremely reliable method for observing the functioning of the mitral valve. However, it is used only when the patient is off cardiopulmonary bypass. The surgeon also needs to observe the valve as many times as necessary before, during, and at the end of the procedure. The saline injection under pressure is favorable for checking the adequacy of the repair. Intraoperative saline test is safety but it was a 8% misleading ratio only.

Because of the high risk of sudden death with strangulated ball thrombus and systemic embolization, surgical removal of the ball thrombus should be done immediately after the diagnosis was established.

**References**

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