

GIANT LEFT ATRIUM THROMBOSIS ASSOCIATED WITH AN ASYMPTOMATIC MITRAL VALVE DISEASE

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Mitral valve disease (MVD) can lead to an atrial fibrillation, a left atrium (LA) dilatation and thrombus formation. The aim of the study was to demonstrate a rare clinical case of a patient with asymptomatic MVD with the formation of the huge thrombus in the giant LA.

Material and methods. An asymptomatic 49-year-old man underwent a preventive examination for cardiovascular diseases screening. His past medical history included the chronic tonsillitis only. There were no complaints or any heart disease symptoms. The patient underwent ECG, echocardiography, and after a cardiac surgeon consultation – cardiac MRI.

Results. The ECG showed the atrial fibrillation. Echocardiography revealed a mitral valve lesion with a predominance of stenosis, a dilatation of the LA cavity with a formed mass. Cardiac MRI was performed by recommendation of the cardiac surgeon due to surgical strategy clarification and differential diagnostics with LA myxoma. MRI revealed 3 fixed blood clots in the left atrium. These findings were verified during surgery.

Conclusion. Preventive screening of cardiac diseases with ECG and echocardiography are very important in people with the history of chronic tonsillitis.

Keywords: echocardiography, MRI, mitral stenosis, mitral insufficiency, giant left atrium, huge thrombus, atrial fibrillation.

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ТРОМБОЗ ГИГАНТСКОГО ЛЕВОГО ПРЕДСЕРДИЯ У БОЛЬНОГО С БЕССИМПТОМНЫМ МИТРАЛЬНЫМ ПОРОКОМ СЕРДЦА

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Расширение левого предсердия (ЛП) является частым осложнением митрального порока сердца. У некоторых пациентов с данной патологией встречается фибрилляция предсердий и формирование тромбов в ЛП.

Цель исследования. Продемонстрировать редкий клинический случай асимптомного течения комбинированного митрального порока сердца с образованием гигантского левого предсердия и с формированием тромба.

Материалы и методы. Пациент, 49 лет, проходил профилактическое обследование у кардиолога на предмет скрининга сердечно-сосудистых заболеваний. В анамнезе наличие хронического тонзиллита. Жалобы или какие-либо указания на наличие заболеваний сердца отсутствовали. Пациенту были выполнены ЭКГ, эхокардиография, далее после консультации кардиохирурга – МРТ сердца.

Результаты. При выполнении ЭКГ была выявлена фибрилляция предсердий. Эхокардиография позволила диагностировать комбинированный митральный порок

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сердца с преобладанием стеноза. Также было выявлено расширение полости левого предсердия с наличием в нем дополнительного образования. Пациент был консультирован кардиохирургом, в плане предоперационной подготовки для уточнения тактики операции и дифференциальной диагностики с миксомой ЛП было рекомендовано выполнение МРТ сердца. МРТ позволило выявить 3 фиксированных тромба в ЛП. Данные находки были верифицированы при хирургической операции.

Заключение. Клинический случай показывает важность скрининга сердечно-сосудистых заболеваний с помощью ЭКГ и эхокардиографии у пациентов, страдающих хроническим тонзиллитом.

Ключевые слова: эхокардиография, МРТ, митральный стеноз, митральная недостаточность, гигантское левое предсердие, массивный тромб, фибрилляция предсердий.

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Introduction.

The mitral valve disease is a life-threatening condition that has severe complications and a high mortality rate. The usual complications associated with mitral valve disease are atrial fibrillation and thrombus formation in the cavity of the left atrium. Often left atrium enlargement can be revealed in such patients, and sometimes with a giant left atrium formation.

A left atrium enlargement more than 8 cm in diameter is considered as the giant left atrium [1, 2]. Asymptomatic mitral valve disease with the formation of the huge thrombus in the giant left atrium is extremely rare.

Case Presentation.

A 49-year-old man underwent a preventive screening examination in our clinic. The patient had no medical complaints or clinical symptoms. Risk factors for cardiovascular diseases, including hypertension, diabetes and smoking were not identified. His past medical history included chronic tonsillitis only without medical supervision and treatment. He hadn't any episodes of acute rheumatic fever. The patient performed a regular physical activity and fitness.

On physical exam, his height and weight were 176 cm and 85 kg, body mass index and body surface area were 27.4 kg/m² and 2.05 m². The cardiac examination revealed irregular heart rate and heart murmur.

The electrocardiogram showed atrial fibrillation with a heart rate of 78 bpm, the vertical direction of the electrical axis of the heart, incomplete right bundle branch block. The transthoracic echocardiography revealed a dilatation of the cavity of the left atrium (11.1x9.5 cm, left atrium area 83 cm²) and a formed mass with the dimensions

of 8.6x5.1 cm within the atrial cavity (Fig. 1, 2). A mitral valve lesion with a predominance of stenosis was detected by Doppler ultrasound with maximal velocity of 2.32 m/s and a mitral valve pressure gradient of 21.5/9.2 mm Hg (Fig. 3). Mitral valve area was 0.65 cm². Moderate mitral and tricuspid regurgitations were also revealed. The pulmonary artery systolic pressure was 26 mm Hg. The left ventricle ejection fraction (Simpson method) was normal (65.6%). Mitral valve disease with a predominance of stenosis was diagnosed.

Oral anticoagulant therapy Warfarin 5 mg daily, beta-blocker Bisoprolol 2.5 mg daily, and urgent consultation with a cardiac surgeon were prescribed. Cardiac surgery with extraction and histological verification of the left atrium mass and atrial reconstruction after detailed preoperative examination was planned.

The cardiac magnetic resonance imaging (MRI) was performed to exclude left atrium myxoma and for more accurate surgical planning. MRI is an accurate diagnostic method to assess the anatomy of the left atrium [3] and determine the presence of a blood clot.

Non-contrast 1.5 T MRI confirmed a severe left atrial enlargement (dimensions 9x12x11 cm), and revealed 3 thrombotic masses: the first was 5.3x3.4 cm on the lower wall, the second was 3.8x3.0 cm on the upper wall, and the third was 1.6x1.6x3.0 cm on the left side wall, with a heterogeneous structure, affixed by a wide base to the atrial wall, without significant flotation (Figure 4). MRI area of the mitral valve opening was 1.9 cm².

Data from laboratory analyses and imaging examinations did not indicate a cancer, thrombophilia, connective tissue diseases, thyroid disorders, or any clinically significant deviations.

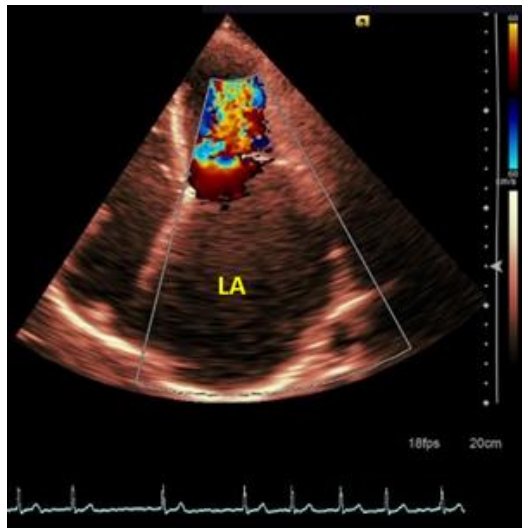


Fig. 1 а (Рис. 1 а)

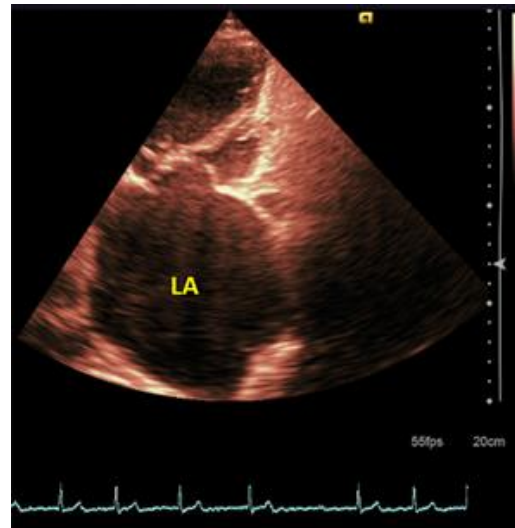


Fig. 1 б (Рис. 1 б)

Fig. 1. The transthoracic echocardiography.

а – the apical four-chamber view with color Doppler. б – the apical two-chamber view. The giant left atrium (LA) can be seen.

Рис. 1. Трансторакальная эхокардиография, апикальный доступ.

а – четырехкамерная проекция с цветным доплеровским картированием. б – двухкамерная проекция. Выраженное расширение полости левого предсердия (обозначено как LA).



Fig. 2 а (Рис. 2 а)



Fig. 2 б (Рис. 2 б)



Fig. 2 в (Рис. 2 в)

Fig. 2. The transthoracic echocardiography, the positive mass in the left atrium (the yellow contours).

а – the parasternal long axis view. б – the apical four-chamber view. в – the apical two-chamber view.

Рис. 2. Трансторакальная эхокардиография, гиперэхогенное образование в левом предсердии (обозначено желтым контуром).

а – проекция по длинной оси, парастеральный доступ. б – апикальная четырехкамерная проекция. в – двухкамерная проекция.

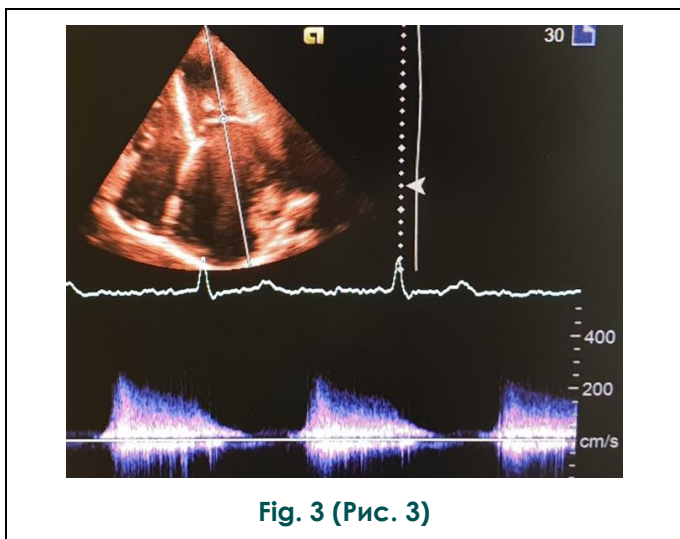


Fig. 3 (Рис. 3)

Fig. 3. The transthoracic echocardiography, continuous Doppler of the transmitral flow from the apical four-chamber view.

The mitral valve disease with increased blood flow velocity (V_{max} 2.32 m/s) and pressure gradients (maximum 21.5 mm Hg, mean 9.2 mm Hg).

Рис. 3. Трансторакальная эхокардиография, непрерывное спектральное доплеровское картирование трансмитрального потока из апикального четырехкамерного сечения.

Выявлен комбинированный митральный порок сердца с повышением скорости кровотока (V_{max} 2,32 м/с) и градиентов давления (максимальный 21,5 мм. рт. ст., средний 9,2 мм. рт. ст.).

Selective coronary angiography determined dextral blood supply to the myocardium and intact coronary arteries. A 24-h Holter monitoring electrocardiogram identified ventricular extrasystoles according to Lown and Wolff IV B grading, and one episode of asymptomatic non-sustained ventricular tachycardia (4 complexes).

Mitral valve replacement by mechanical prosthesis On-X 31 was performed with preservation of the posterior subvalvular structures, removal of the blood clots from the left atrium (Fig. 5), and a tricuspid annuloplasty on the band. Histological examination confirmed the thrombotic nature of the masses in the left atrium.

There were non-sustained ventricular tachycardia and atrial flutter in the early postoperative period.

Treatment by Bisoprolol 5 mg, Amiodarone 200 mg, Warfarin 5 mg with international normalized ratio control, Acetylsalicylic acid 100 mg, Pantoprazole 40 mg daily were prescribed.

On a scheduled examination in a month after surgery transthoracic echocardiography revealed no clot or masses in the left atrium, the function of the mitral valve prosthesis was satisfactory (Fig. 6). The pressure gradient on the prosthesis was 11.4/3.8 mm Hg.

Discussion.

The giant left atrium is a rare condition (incidence of 0.3% in the rheumatic heart disease). It is mainly associated with the mitral stenosis and the atrial fibrillation [4].

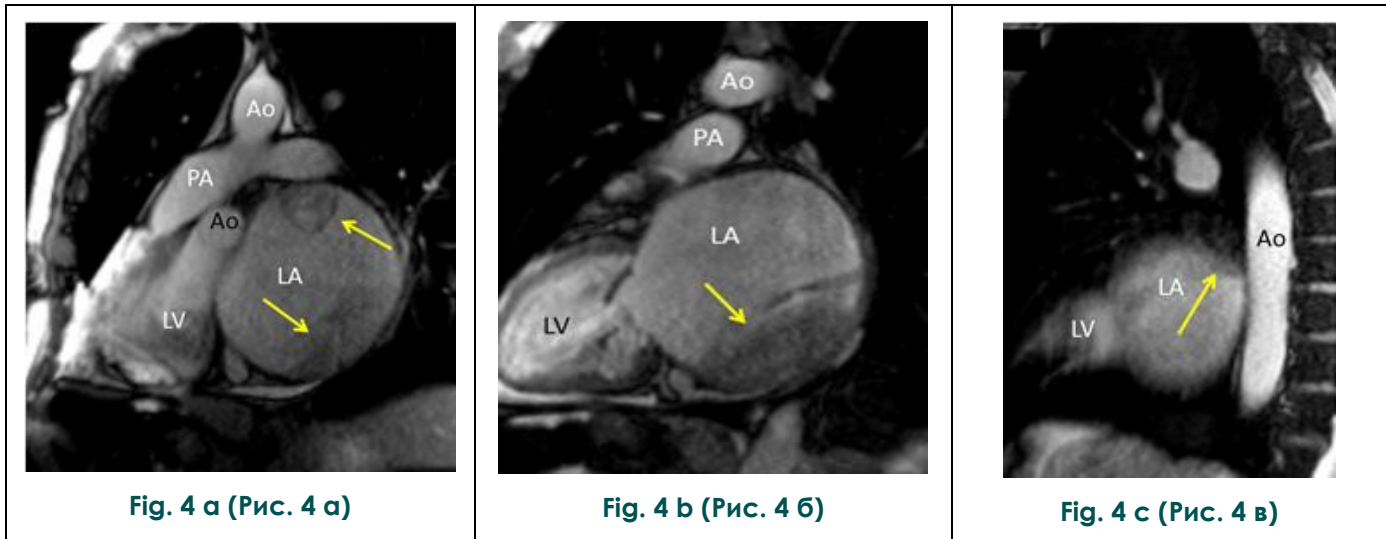


Fig. 4 a (Рис. 4 а)

Fig. 4 b (Рис. 4 б)

Fig. 4 c (Рис. 4 в)

Fig. 4. Cardiac MRI, non-contrast images in diastole.

a, c – oblique slices, b – long axis two-chamber view. Three thrombotic masses were found in the left atrium (arrows). LA – left atrium, LV – left ventricle, Ao – aorta, PA – pulmonary artery.

Рис. 4. МРТ сердца, изображения без введения контрастного препарата, диастола.

а, в – косые срезы, б – двухкамерная проекция по длинной оси левого желудочка. В левом предсердии выявлены три тромба (обозначены стрелками). LA – левое предсердие, LV – левый желудочек, Ao – аорта, PA – легочная артерия.



Fig. 5 (Рис. 5)

Fig. 5. Gross specimen after the operation.

The blood clot extracted from the left atrium.

Рис. 5. Макропрепарат после операции.

Тромботические массы, извлеченные из левого предсердия.

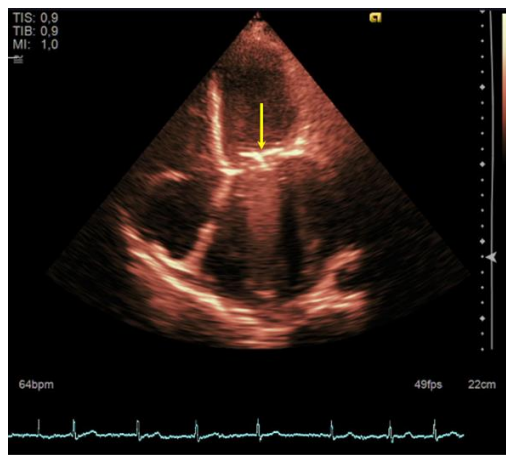


Fig. 6 (Рис. 6)

Fig. 6. The transthoracic echocardiography, the mitral prosthesis (the arrow), the apical four-chamber view.

No blood clot or masses in the left atrium

Рис. 6. Трансторакальная эхокардиография, апикальная четырехкамерная проекция.

Объемных образований и тромботических масс в левом предсердии не выявлено. Виден установленный протез митрального клапана (обозначен стрелкой).

A search for "Giant left atrium with/without blood clots" was performed on the PubMed and Web of Science databases. 55 suitable clinical cases were selected and analyzed. The giant left atrium without cavity blood clots was described in 26 of the 55 articles. All patients in those cases had a history of rheumatic heart disease with mitral valve replacement and pronounced clinical symptoms requiring emergency hospitalization. The maximum described left atrium size was 20.9x9.6 cm revealed by transthoracic echocardiography in a 58-year-old patient [5]. 12 of the articles described clinical cases of giant left atrium, with thrombi in the left atrium cavity [6-17]. The largest left atrium blood clot was 11.5x6.6 cm, detected by transthoracic echocardiography in a 50-year-old patient with a mitral valve replacement, complaining of left-sided hemiparesis [6]. All patients in the cases had a history of chronic rheumatic heart disease with mitral valve replacement, atrial fibrillation and severe clinical symptoms requiring hospital treatment. The most interesting features in our clinical case are the absence of any patient complaints and no history of cardiovascular diseases, while one of the largest blood clot masses described in the scientific literature was found [7-9].

Rheumatic heart disease (RHD) is a preventable chronic cardiovascular condition, which affects more than 30 million individuals worldwide

and is responsible for about 300000 deaths annually. These deaths mostly occur among children and young adults living in low- and middle-income countries and among indigenous populations of some high-income countries [18-19]. With the recent increasing migrant flows toward developed countries, it is going to become a less infrequent finding of marked discrepancy between mitral disease severity and patients' symptoms (most cases in young people).

The clinical case demonstrates that serious complications of the mitral valve disease such as atrial fibrillation, the giant left atrium cavity and thrombus formation may be completely asymptomatic. Regular preventive screening examinations with electrocardiogram and echocardiography in patients with a history of chronic tonsillitis can be useful for early detection of such conditions, and for the prevention of complications.

Conclusion.

The giant left atrium, atrial fibrillation and the thrombus formation in patient with asymptomatic mitral valve disease is extremely rare in clinical practice. The presented clinical case shows the importance of preventive screening of cardiac diseases with ECG and echocardiography in people with the history of chronic tonsillitis.

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