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CASE REPORT

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Silent giant left atrium: A case report

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Abstract

A 30-year-old woman presented with low-grade dyspnea on exertion. Chest X-ray demonstrated enlarged cardiac silhouette but was insufficient to delineate the cause. Echocardiogram revealed the cause to be the giant left atrium from mitral stenosis.

KEYWORDS

echocardiography, left atrium, mitral stenosis, rheumatic heart disease

1 | INTRODUCTION

Enlarged left atrium (LA) is a common finding in severe mitral stenosis (MS) and severe mitral regurgitation (MR). It can expand to giant proportions.[1] The unusual finding in our 30-year-old woman presenting with only mild dyspnea despite markedly dilated LA prompted us to report this case. The interpretation of the enlarged cardiac silhouette on chest radiography (CXR) proved challenging due to a huge LA chamber.

2 | CASE PRESENTATION

A 30-year-old woman without significant medical history presented with dyspnea on exertion (NYHA class I). The physical examination revealed a blood pressure of 110/70 mm Hg with an irregular pulse rate of 76 beats/min and had an oxygen saturation of 98% on room air. There was no peripheral edema, and the neck veins were flat. Mid-diastolic and grade III pansystolic murmur could be heard at the apex on cardiac auscultation. However, respiratory and abdominal examinations were not significant.

The electrocardiogram on admission showed atrial flutter with a variable block (Figure 1). The CXR revealed massive cardiomegaly with the left heart border showing a prominent main pulmonary artery and left atrial appendage. A double contour of atrial shadow was noticed on the right heart border (Figure 2). An echocardiogram showed a giant LA measuring 14.4 cm × 16.7 cm that encroached on the other cardiac chambers and a left ventricular ejection fraction of 48% (Figure 3). Thickened mitral valves along with doming and restricted motion of anterior and posterior mitral leaflets were diagnostic of rheumatic heart disease (RHD). There was severe MS with a mitral

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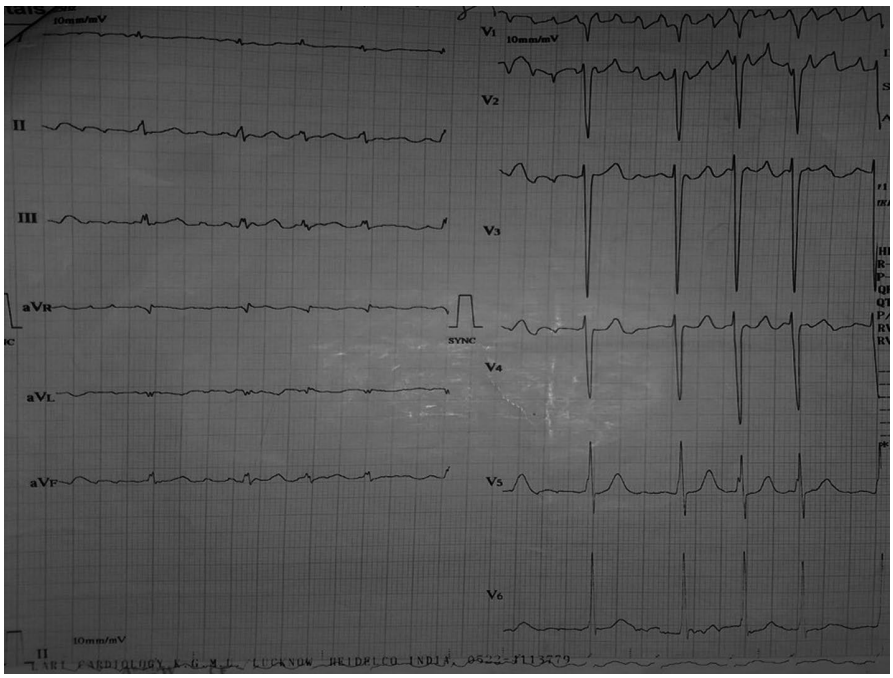

FIGURE 1 Twelve-lead electrocardiogram showing atrial flutter with variable block

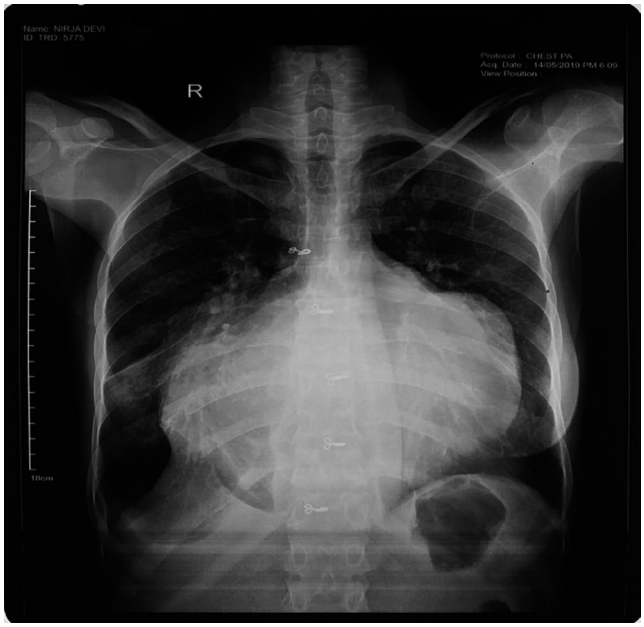

FIGURE 2 Chest radiograph in PA view showing massive cardiomegaly. The left heart border showed prominent main pulmonary artery and left atrial appendage. The apex could not be commented upon. The right heart border showed double contour of atrial shadow

valve area of 0.9 cm^2 on mitral valve planimetry and moderate MR with vena contracta of 4 mm and an effective regurgitant orifice area of 0.3 cm^2.

Furosemide 20 mg PO was administered daily with improvement after which she was discharged from the hospital. She reported continued improvement in her dyspnea on her follow-up visit in the outpatient clinic 2 weeks later.

3 | DISCUSSION

LA size greater than 6.5 cm is considered as giant LA.[2] The reported incidence is 0.3–0.6% and is most commonly associated with rheumatic mitral valve disease.[1] The giant LA seen in RHD could be due to rheumatic pancarditis as hypothesized by Dr. Hurst.[3] The already damaged left atrium would be easily dilated when it experiences a large volume overload as seen in severe MR.[3] A few reports of giant LA from non-rheumatic etiology such as mitral valve prolapse,[4,5] hypertrophic cardiomyopathy,[6] and cardiac amyloidosis[7] have been published.

When mitral valve disease is a long-standing process, it leads to LA enlargement as a compensatory mechanism to ease the markedly increased LA pressure which could result pulmonary congestion due to back-pressure hemodynamics, hence protecting the lung from the development of pulmonary hypertension.[8] While these compensatory mechanisms help the patient remain asymptomatic for a long time, he or she gradually deteriorates due to progressive increase in LA pressure leading to an inevitable increase in pulmonary venous pressure.[9]

Enlarged LA may cause atrial fibrillation which may further increase the size of the LA.[10] Giant LA predisposes an individual toward thrombus formation and thromboembolic events, pulmonary edema, and pulmonary hypertension. Furthermore, the esophagus and airway may be compressed by its enlarged posterior wall resulting in dysphagia and respiratory difficulties.[2,11] Despite all these complications, in rare instances, patients may be completely asymptomatic.[12]

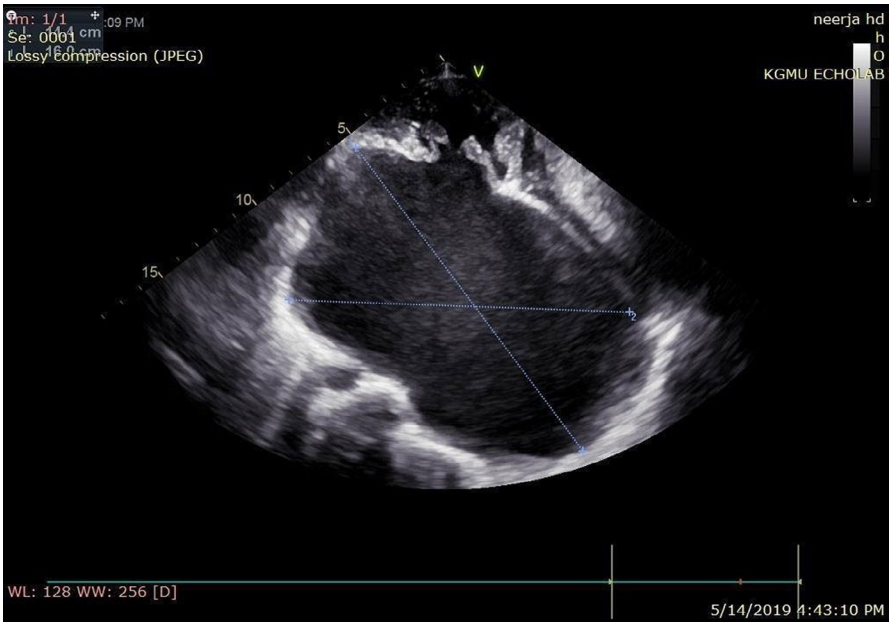

FIGURE 3 Two dimensional echocardiogram demonstrating a giant LA measuring 14.4 cm × 16.7 cm that encroached on the other cardiac chambers. Thickened mitral valves along with doming and restricted motion of anterior and posterior mitral leaflets was diagnostic of RHD

The CXR is a useful modality for diagnosing LA enlargement. However, it may be difficult to interpret when the left atrium reaches massive proportions. In our case, we could not specifically appreciate the enlarged cardiac chamber in CXR but was revealed by the echocardiogram. It is important to note that the size of the LA does not change after mitral valve replacement (MVR) because of irreversible changes in the atrial muscles by fibrosis.[11]

Symptomatic giant LA can be repaired by atrial plication at the time of MVR.[13] However, this procedure may result in adverse outcomes such as injury to circumflex coronary artery, obstruction of pulmonary vein, and formation of esophageal stricture.[14]

4 | CONCLUSION

Progressive LA enlargement may be undetected and well-tolerated for a long time, even when it reaches massive proportions. When the LA enlarges to a gigantic size, a CXR is not sufficient to delineate the cause of cardiomegaly and can even be misleading. Echocardiogram is the most useful method for evaluating these patients. There is a poor correlation between the size of the LA and the severity of the MS, and our case serves to create awareness to clinicians to consider full diagnostic work up for enlarged LA as patients may not always have symptoms.

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CONFLICT OF INTERESTS

The abstract of this case has been presented and published in Annual Chest 21 conference and its supplement with 10.1016/j.chest.2021.07.128.

AUTHOR CONTRIBUTIONS

SV, AP, PS, and VJ wrote the abstract, introduction, case, discussion, conclusion. NBP and DS performed critical edits of the draft, and prepared the final version of this manuscript which was approved by all authors.

ETHICAL APPROVAL

Need for ethical approval waived. Consent from the patient deemed to be enough.

CONSENT

Written informed consent has been taken from the patient which would be available upon the Editor-in-Chief's request.

DATA AVAILABILITY STATEMENT

None.

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REFERENCES

1. El Maghraby A, Hajar R. Giant left atrium: a review. *Heart Views*. 2012;13(2):46-52.
2. Kawazoe K, Beppu S, Takahara Y, et al. Surgical treatment of giant left atrium combined with mitral valvular disease. Plication procedure for reduction of compression to the left

ventricle, bronchus, and pulmonary parenchyma. *J Thorac Cardiovasc Surg*. 1983;85(6):885-892.
3. Hurst JW. Memories of patients with a giant left atrium. *Circulation*. 2001;104(22):2630-2631.
4. Phua GC, Eng PCT, Lim SL, Chua YL. Beyond Ortner's syndrome–unusual pulmonary complications of the giant left atrium. *Ann Acad Med Singap*. 2005;34(10):642-645.
5. Brownsberger RJ, Morrelli HF. Hoarseness due to mitral valve prolapse. *J Am Geriatr Soc*. 1988;36(5):442-443.
6. Yuksel UC, Kursaklioglu H, Celik T. Apical hypertrophic cardiomyopathy with giant left atrium. *Arq Bras Cardiol*. 2007;88(2):e47.
7. Cheng Z, Fang Q, Liu Y. Cardiac amyloidosis with giant atria. *Heart*. 2010;96(22):1820.
8. Schwammenthal E, Vered Z, Agranat O, Kaplinsky E, Rabinowitz B, Feinberg MS. Impact of atrioventricular compliance on pulmonary artery pressure in mitral stenosis: an exercise echocardiographic study. *Circulation*. 2000;102(19):2378-2384.
9. Plaschkes J, Borman JB, Merin G, Milwidsky H. Giant left atrium in rheumatic heart disease: a report of 18 cases treated by mitral valve replacement. *Ann Surg*. 1971;174(2):194-201.
10. Sanfilippo AJ, Abascal VM, Sheehan M, et al. Atrial enlargement as a consequence of atrial fibrillation. A prospective echocardiographic study. *Circulation*. 1990;82(3):792-797.
11. Apostolakis E, Shuhaiber JH. The surgical management of giant left atrium. *Eur J Cardiothorac Surg*. 2008;33(2):182-190.
12. Funk M, Perez M, Santana O. Asymptomatic giant left atrium. *Clin Cardiol*. 2010;33(6):E104-E105.
13. Isomura T, Hisatomi K, Hirano A, Maruyama H, Kosuga K, Ohishi K. Left atrial plication and mitral valve replacement for giant left atrium accompanying mitral lesion. *J Card Surg*. 1993;8(3):365-370.
14. Tonguç E, Kestelli M, Özsöyler İ, et al. Limit of indication for plication of giant left atrium. *Asian Cardiovasc Thorac Ann*. 2001;9(1):24-26.

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