

Biatrial appendages clots in a rheumatic heart disease patient – an important lesson to remember

Anshul Kumar Gupta¹, Sunil Dhondiram Shewale¹, Kanchanahalli Siddegowda Sadananda², Chollenahally Nanjappa Manjunath¹

¹Sri Jayadeva Institute of Cardiovascular Sciences & Research, Bannerghatta Road, Bangalore, 560069, Karnataka, India.

²Sri Jayadeva Institute of Cardiovascular Sciences & Research, K R Hospital Complex, Mysore, 570001, Karnataka, India.

ABSTRACT

Patients with Atrial fibrillation (AF) are quite prone to develop atrial clots due to stasis from impaired atrial contractile function. While left atrial (LA) and left atrial appendage (LAA) thrombi are quite common, right atrial (RA) and right atrial appendage (RAA) clots are uncommonly seen. Structural and functional differences between RAA and LAA have been implicated in lower prevalence of RAA clots in AF patients. We report here simultaneous LAA and RAA clots in a patient with Rheumatic heart disease, mitral stenosis and Atrial fibrillation. Though current guidelines do not make a specific mention of RAA assessment, we highlight the fact that a comprehensive echocardiographic evaluation of both atrial appendages is of paramount importance in atrial fibrillation patients especially those who are planned to undergo balloon mitral valvotomy or cardio version.

Key words: Right atrial appendage, Left atrial appendage, atrial fibrillation, Mitral stenosis, clot.

Correspondence

Dr Anshul Kumar Gupta

Department of Cardiology Sri Jayadeva Institute of Cardiovascular Sciences & Research, Jayanagar 9th block, Bannerghatta Road, Bangalore - 560069 Karnataka, India.

Email:- dr.anshulkumargupta@gmail.com

Phone : +91 96116 18601

Submission Date: 21-05-2016;

Revision Date: 31-08-2016;

Accepted Date: 12-09-2016

DOI : 10.5530/jcdr.2016.3.7

CASE REPORT

A 39 years lady presented with 6 months history of NYHA class II fatigue and dyspnea. On clinical examination she had irregular pulse, loud and variable S1, loud P2 and a mid-diastolic murmur in mitral area. A 12 lead ECG revealed atrial fibrillation. Transthoracic echocardiogram showed severe mitral stenosis with valve area of 1.0 cm² and mild mitral regurgitation. The patient was planned for Balloon mitral valvotomy. Prior to the procedure, transesophageal echocardiogram (TEE) was done to rule out clots. TEE revealed dilated left atrium (LA) while left atrial appendage (LAA) had a 17 x 10mm clot (Figure 1A). LAA velocity was reduced (Figure 2). The Right atrial appendage (RAA) also had a clot measuring 18 x 12mm (Figure 1B). Patient had mild mitral regurgitation. In view of biatrial appendages clots, oral anticoagulation with warfarin was advised and balloon valvotomy was deferred.

DISCUSSION

Atrial thrombi are quite common in patients with atrial fibrillation due to impaired mechanical contraction of atria. Although both atria are fibrillating, the incidence of LAA thrombus (10%-15%) is reported much higher than RAA thrombus (2%-7%)¹⁻³. In patients with Mitral stenosis, the effect of stasis due to mechanical obstruction adds to the thrombotic milieu due to poorly contracting atria, escalating the thrombotic risk manifold. The incidence of RAA clots in such patients may be as high as 25%⁴. Simultaneous bi-atrial appendage clot formation has been reported in the settings of atrial fibrillation, heart failure in sinus rhythm and also in a patient with heparin induced thrombocytopenia.⁵⁻⁷

Several reasons have been implicated for the lower prevalence of RAA clots. A study by Subramaniam *et al* in 92 patients with TEE imaging showed that RAA had a wider neck compared to LAA but RAA area and LAA area were found to be similar. So the neck width/area ratio was higher for RAA than LAA (0.56 ± 0.15 vs 0.41 ± 0.14) (P < 0.001). Interestingly there was lack of anatomic remodelling (dilatation) of RAA in patient with AF.⁸ In a study of 1042 patients by Cresti *et al* RAA thrombus

was seen in only 7 patients while LAA clots were present in 91 patients.⁹ Three of these patients had both appendages clots. The risk of thrombus formation in LAA is correlated to several factors including LA size, LAA velocity, presence of spontaneous echo contrast, absence of mitral regurgitation. However the presence of spontaneous echo contrast was found to be the only independent predictor of RAA thrombus formation.³

Due to uncommon occurrence of RA thrombus in AF patients, there is lack of guidelines or consensus opinion regarding RA imaging prior to procedures. The recent 2014 American Heart Association/American College of Cardiology guidelines for management of AF gives Class IIa recommendation for TEE evaluation of LA and LAA before cardioversion if AF > 48 hours duration. However there is no specific mention for RA or RAA evaluation.¹⁰

Our patient presented with severe mitral stenosis and long standing AF and had simultaneous biatrial appendage clots. Such patients are at high risk of thromboembolism to systemic and pulmonary circulations. Transcatheter interventions like inter atrial septal puncture and balloon mitral valvotomy may result in catastrophes like pulmonary embolism, or cerebrovascular accident, peripheral limb ischemia, or embolism to mesenteric or coronary circulations. To avoid these embolic complications, TEE assessment should be done in all patients with atrial fibrillation as it provides optimal visualization of both atrial appendages. A comprehensive echocardiographic visualization of both atria and their appendages is of paramount importance in patients with atrial fibrillation who are planned for procedures like balloon mitral valvotomy.

Learning points from this case:

- Atrial fibrillation is a common arrhythmia in patients with Mitral stenosis and predisposes to thrombus formation and embolism especially in patients undergoing Balloon mitral valvotomy.
- RA appendage clots are less common than LA appendage clots in patients with AF.
- TEE provides optimal visualization of Left and Right atrial appendages.

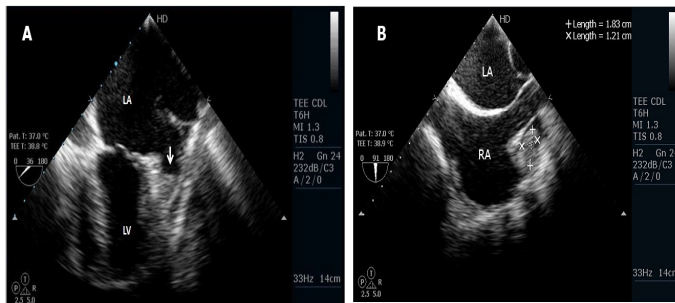


Figure 1: Biatrinal appendages clots. A: Transesophageal echo (TEE) showing clot in Left atrial appendage (arrow). B: Bicaval TEE view showing clot in Right atrial appendage.

- A comprehensive TEE evaluation of LA appendage and RA appendage should be done in all patients with Atrial Fibrillation undergoing Balloon Mitral Valvotomy.

REFERENCES

1. Manning WJ, *et al*: Cardioversion from atrial fibrillation without prolonged anticoagulation with use of transesophageal echocardiography to exclude the presence of atrial thrombi. *N Engl J Med* 1993;328(11):750-5. <http://dx.doi.org/10.1056/NEJM199303183281102> ; PMID:8437595.
2. Silverman DI, Manning WJ: Role of echocardiography in patients undergoing elective cardioversion of atrial fibrillation. *Circulation* 1998;98(5):479-86. <http://dx.doi.org/10.1161/01.CIR.98.5.479> ; PMID:9714099
3. de Divitiis M, *et al*: Right atrial appendage thrombosis in atrial fibrillation: Its frequency and its clinical predictors. *Am J Cardiol* 1999;84(9):1023-8. [http://dx.doi.org/10.1016/S0002-9149\(99\)00492-0](http://dx.doi.org/10.1016/S0002-9149(99)00492-0).
4. Sahin T *et al*: Right atrial appendage function in different etiologies of permanent atrial fibrillation: a transesophageal echocardiography and tissue Doppler imaging study. *Echocardiography* 2010;27(4):384-93. <http://dx.doi.org/10.1111/j.1540-8175.2009.01027.x> ; PMID:20331694.
5. Davila CD, Pandian NG. Simultaneous Right and Left Atrial Appendage Thrombus in a Patient with Atrial Fibrillation: A Lesson to Remember. *Echocardiography* 2015;32(12):1873-5. <http://dx.doi.org/10.1111/echo.13044> ; PMID:26332794.

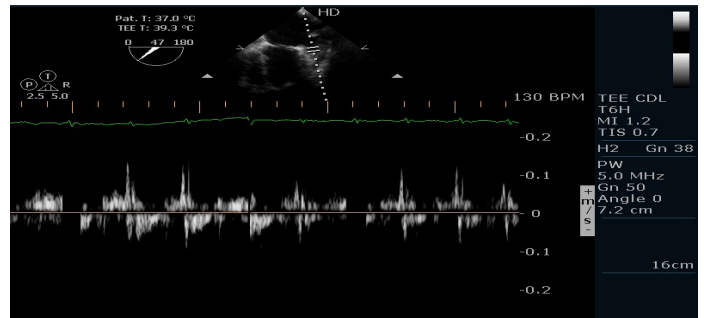


Figure 2: TEE with pulse wave Doppler at LAA showing reduced LAA velocities.

7. Oe H, Ohno Y, Yamanaka T *et al*. Biatrinal appendage thrombi in a Heart failure patient with sinus rhythm detailed assessment by Real-time 3-Dimensional Transesophageal Echocardiography. *Circulation* 2016;133(1):e1-4. <http://dx.doi.org/10.1161/CIRCULATIONAHA.115.018522> ; PMID:26719391.
8. Munakata M, Hatakeyama M, Ono Y. Thrombosis of biatrial appendages due to heparin-induced thrombocytopenia. *Asian Cardiovascular and Thoracic Annals*. 2013;21(2):245-6. <http://dx.doi.org/10.1177/0218492312450700> ; PMID:24532637
9. Subramaniam B, *et al*: Transesophageal echocardiographic assessment of right atrial appendage anatomy and function: comparison with the left atrial appendage and implications for local thrombus formation. *J Am Soc Echocardiogr* 2006;19:429-33. <http://dx.doi.org/10.1016/j.echo.2005.10.013> ; PMID:16581482.
10. Cresti A *et al*: Frequency and Significance of Right Atrial Appendage Thrombi in Patients with Persistent Atrial Fibrillation or Atrial Flutter. *J Am Soc Echocardiogr* 2014;27(11):1200-7. <http://dx.doi.org/10.1016/j.echo.2014.08.008> ; PMID:25240491.
11. January CT, *et al*: 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: executive summary: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and the Heart Rhythm Society. *J Am Coll Cardiol* 2014;64:2246-80. <http://dx.doi.org/10.1016/j.jacc.2014.03.021>

Cite this article : Gupta AK, Shewale SD, Kanchanahalli Siddegowda Sadananda, Manjunath CN. Biatrinal appendages clots in a rheumatic heart disease patient – an important lesson to remember. *Journal of Cardiovascular Disease Research*. 2016;7(3):126-7.