

The Comparative Value Of Transesophageal & Transthoracic Echo In Detection Of Clot In Left Atrium

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S U M M A R Y

Left atrial thrombi are common in severe mitral stenosis. We studied sixteen cases of severe mitral stenosis. All these patients had transthoracic echo (TTE) followed by biplane transesophageal echo (TEE). Only two patients were in sinus rhythm. Left atrial clot was identified in eight out of fourteen patients who were in Atrial Fibrillation, on TEE, while TTE could detect clot in one patient only.

METHOD

Sixteen cases of severe M.S. who were admitted at Cardiology Unit of Civil Hospital Karachi between Jan. 92 - May 92 were recruited in this study. (Mean age 35 ± 10 years).

All these patients had routine transthoracic Echo/Doppler examination on Toshiba SSH-65A, mitral valve area was calculated both by planimetry and pressure 1/2 time method. Mean mitral valve area was between 1.2 - 0.7cms.

TRANSESOPHAGEAL ECHO

All sixteen cases underwent TEE examination after fast of 4hrs, lignocaine gargles and I/V diazepam was used as surface anesthetic agent and sedative respectively. Patients with H/O of sore throat, pharyngitis, dysphagia and uncontrolled rhythm disturbances were not included in the study.

TEE was performed by Toshiba Color flow model SSH-65A & biplane phased array probe, model PEF 508SC.

RESULTS

Out of sixteen patients with severe M.S., only two patients were in sinus rhythm, remaining fourteen were in AF and/or in A.Flutter. (Table I).

Huge clot was identified in left atrial cavity in one patient on TTE examination. On the contrary eight patients with severe M.S. and AF were found



Fig. 1

Transesophageal echo cardiogram in patient with mitral stenosis. Note thickened mitral valve and clot in left atrial appendage.

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to have clot in left atrial appendage on TEE examination, and only in one case clot extended to left atrial cavity.

Spontaneous contrast echoes due to the turbulence of the blood flow were seen in all the cases on TEE examination, however they were more marked in patients with atrial fibrillation.

Discussion

Transesophageal echo is a safe technique and is far more sensitive than transthoracic approach in picking up LAA clot. Severe mitral stenosis where turbulence of blood flow in all cases produces spontaneous contrast echoes, stagnation of blood flow encouraged by the atrial fibrillation increases the chances of clot formation substantially. Left atrial appendage which is the posterior part of the left atrium is the commonest site for clot formation, unfortunately this part of the left atrium is not visible on TTE, hence one can easily miss the clot on routine transthoracic examination.

Out of our eight patients who had clot in LAA, only in one case³ clot extended to left atrial cavity, interestingly he never had symptoms suggestive of systemic embolism. On the contrary one patient



Fig. 2

Transesophageal echo cardiographic frontal long axis four chamber view of heart. Note thickened mitral valve and spontaneous contrast echoes in left atrium on minimum gain.

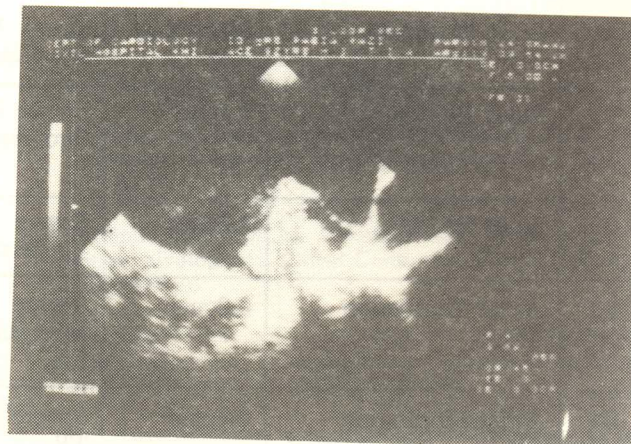


Fig. 3

Transesophageal echocardiographic basal short axis view, showing clot in left atrial appendage. In patient with severe mitral stenosis.

who had clot in LAA visualized on TEE only, had right sided hemiparesis and another patient had episodes of repeated TIAs. Thus out of eight cases of LAA clot only two had symptoms due to systemic embolism, both these patients were in atrial fibrillation.

Appearance of the clot can suggest to some extent if it's likely to through showers of emboli in systemic circulation, however one can not deny from the fact that any clot can dislodge moreover extension of the clot encouraged by persistent atrial fibrillation is always likely. Thus risk of systemic embolism persists as long as the underlying pathology remain untreated.

Conclusion

Transesophageal echo is far more sensitive in picking up cardiac sources of emboli, and we strongly recommend that all cases of severe mitral stenosis in atrial fibrillation should be on routine oral anticoagulants, as even the first episode of systemic embolism can be detrimental to life and health.

Thus we concluded that transesophageal echo is far more sensitive in detection of LAA clot and

TABLE - I

Case#	ECG Findings	Mean MV Area	Trans Thoracic Echo/Doppler Findings	Transesophageal Echo Findings
01	Sinus Rhythm	1.1cms ²	Severe MS, Mild AS/AR. No thrombus	Spontaneous Echo contrast in LA No thrombus seen.
02	Sinus Rhythm	1.2cms ²	Severe MS, Mild TR & Thickened AV.	No clot seen.
03	Atrial Fibrillation	0.8cms ²	Severe MS, thickened AV, Mild AR. Large thrombus in LA.	Spontaneous Echo contrast. Large thrombus in LAA which extended to LA cavity.
04	Atrial Fibrillation	0.8cms ²	Severe MS, Mild AS, AR & TR	Small thrombus in LAA & spontaneous contrast ECHO.
05	Atrial Fibrillation	1.0cms ²	Severe MS, Trivial MR & TR.	Spontaneous contrast ECHO in LAA, no thrombus seen.
06	Atrial Fibrillation	0.7cms ²	Severe MS, Pulmonary HTN, TR & Thickened Aortic valve	Large thrombus in LAA, Spontaneous contrast ECHO in left atrium
07	Atrial Flutter	0.9cms	Severe MS, Mild AR & TR.	Spontaneous contrast ECHO & Clot in LAA.
08	Atrial Flutter/ Fibrillation	0.9cms	Severe MS, Trivial MR & TR	Spontaneous contrast ECHO, No thrombus in LA.
09	Atrial Flutter	1.2cms ²	MS with mild TR, Thickened AV with trivial AR. No thrombus.	Spontaneous contrast ECHO; No thrombus identified.
10	Atrial Fibrillation	0.8cms	Severe MS, Calcified MV. Mild/moderate AS/AR. No thrombus seen.	Thrombus attached to left atrial appendage.
11	Atrial Fibrillation	0.9cms ²	Severe MS with mild TR, Thickened AV with mild AR.	Spontaneous contrast ECHO; in LA, no definite thrombus seen.
12	Atrial Flutter/ Fibrillation	0.8cms	Calcified MV, thickened TV, mild to moderate TR, Thickened AV.	Large clot in LAA/ spontaneous contrast ECHO in LA cavity.
13	Atrial Flutter	0.7cms	Severe MS, Calcified mitral valve, mild TR, No thrombus seen.	Small thrombus in LAA.
14	Atrial Fibrillation	1.1cms ²	MS, TR & trivial MR, no thrombus.	Spontaneous contrast ECHO, no thrombus in LA.
15	Atrial Flutter/ Fibrillation	1.0cms ²	Severe MS, mild AS/AR, mild TR, no thrombus seen.	Spontaneous contrast ECHO in LA, no thrombus seen.
16	Atrial Flutter/ Fibrillation	0.9cms	Severe MS, mild TR & AR.	Spontaneous contrast ECHO & small thrombus in LAA.

we strongly recommend that patients with severe mitral stenosis and AF should be on routine oral anticoagulants.

Transesophageal echo studies have been in use for more than a decade and have proven its superiority over transthoracic approach in certain conditions. By virtue of proximity of esophagus to the atria atrioventricular valves and aorta, it provides anatomic views of thoracic aorta that are unobtainable by the transthoracic approach. In addition TEE permits improved detection and resolution of aortic intimal tears, the atrial septum, thrombi, tumors and vegetations.

We performed TEE on patients with rheumatic heart disease, suspected cases of ASD, coactation of aorta and mitral valve prosthesis. But in this study concentrated on cases of pure severe mitral stenosis.

References:

1. Reappraisal by transesophageal echo of the significance of left atrial thrombi in the prediction of systemic embolisation in Rheumatic Mitral Valve disease. *Am. J Cardiology* 92 Sept. 15. 70 (769-73).
2. Exclusion of atrial thrombus by transesophageal echocardiography. *J-Am Soc. Echocardiography* 1992 Jan-Feb 5(1) 52-6.
3. Systemic embolism as a complication of percutaneous mitral valvuloplasty. *Cathet-Cardiovasc-Diagn.* 1992 Apr; 25(4) 327-30.
4. Spontaneous left atrial echo contrast in transesophageal echo-cardiography (LA-German.) (*Schweiz-Med-Wochensh*-1992 April 11-122(15)(549-53).
5. The transesophageal echocardiographic diagnosis of left atrial myxoma simulating left atrial thrombus in the setting of Mitral Stenosis. *Clinical Cardiology* 1992 May 15(5):379-82.
6. Embolization of left atrial thrombus during transesophageal echocardiography 1992 May. June 5(3): 271-3.