

ATRIAL CLOTS AND THEIR CORRELATION WITH VARIOUS DENOMINATORS: A study of 26 cases

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ABSTRACT

Objective: To study the correlation of various denominators in 26 cases with atrial thrombus in left atrial cavity.

Design: A prospective observational study conducted between May 1999 and December 2003 at department of medicine, Ayub Teaching Hospital, Abbottabad, Pakistan.

Patient & Method: Twenty six cases (16 female 10 male) with mean age of 44 ± 6.1 years with clot in left atrial cavity were studied. They were examined for the etiology of left atrial thrombi, atrial fibrillation and spontaneous contrast. Other measurements included determination of mitral valve area, left atrial size, mitral valve peak pressure gradient, right ventricular systolic pressure and left ventricular ejection fraction.

Results: Eighteen patients were in atrial fibrillation and five had spontaneous contrast on echocardiography. All had mitral stenosis with mean mitral valve area of $1.12\text{cm} \pm .48\text{ cm}$. Mean peak mitral valve pressure gradient was $15 \pm 2\text{ mmHg}$. Left atrial size $53 \pm 6\text{ mm}$ and mean RVSP was $55\text{mmHg} \pm 2.44$. Mean LV EF was $48.5 \pm .44\%$.

Conclusion: Severe mitral stenosis is the major underlying disease for the thrombus formation in left atrial cavity. Atrial fibrillation, left atrial dilatation and pulmonary hypertension are its frequent accompaniments.

KEYWORDS: Atrial clots

Pak J Med Sci April-June 2005 Vol. 21 No. 2 210-2

INTRODUCTION

Intracardiac thrombi are known to occur in a variety of cardiac diseases. It is the precursor of arterial thromboembolism often with

catastrophic results. Left atrial thrombi which is the focus of our present study happen mainly in mitral stenosis especially with atrial fibrillation and dilated left atrium. It has also been described in cardiomyopathies and ischemic heart disease with impaired left ventricular function.¹

Rheumatic heart disease is a common cardiac ailment in tropical and subtropical countries causing mitral stenosis and predisposing to left atrial thrombus formation.²

Left atrial thrombi are seen in 14-36% of mitral stenosis on autopsies while echocardiographic evidence is seen in 33-61% cases. Left atrial thrombi are also reported in 19% of cases with dilated cardiomyopathy.³

Twenty six consecutive cases with clot in left atrial cavity, detected by transthoracic echocardiography were studied for the major

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- * Received for publication: April 6, 2004
Revision received: December 3, 2004
Revision accepted: January 13, 2005

underlying disease and correlation with other denominators.

PATIENT AND METHOD

This is a prospective observational study of 26 consecutive cases with left atrial clot formation on transthoracic echocardiography. Patient age and gender was recorded. After the clinical examination and ECG recording, echocardiography was repeated to measure the left atrial size and see the spontaneous contrast in the left atrium mitral valve area by pressure half time method, gradient across mitral valve during diastole, Right Ventricular Systolic Pressure (RVSP) and Left Ventricular Ejection Fraction (LVEF) was also noted.

The study was conducted between May 1999 and December 2003 at echocardiographic section of Department of Medicine, Ayub Teaching Hospital, Abbottabad, Pakistan. Toshiba SSH-140 A color flow doppler system was used for the purpose.

Patients having left ventricular and right ventricular clots without left atrial clots were excluded from the study.

RESULT

Sixteen female and 10 male patients with mean age of 44 ± 6 were included in this study. Clinically these cases belonged to NYHA functional class II & III, with the findings of mitral stenosis. Eighteen of 26 had atrial fibrillation and 5 had spontaneous contrast in left atrium on echocardiography. Other parameters are highlighted in Table-I.

DISCUSSION

Mitral stenosis is a common sequelae of rheumatic fever and it specifically predisposes to left atrial thrombus formation and systemic arterial thromboembolism.² It was found to be the sole disease underlying LA clot formation detected by transthoracic echocardiography in our study. All the cases had severe degree of mitral stenosis, com-

TABLE-I

<i>Denominator</i>	<i>Number/%</i>
Atrial fibrillation	18/26(70%)
Spontaneous contrast	5/26(20%)
Mean MVA	$1.12 \pm .48\text{cm}$
Mean LA size	$53 \pm 6\text{cm}$
Pressure gradient across mitral valve	$15 \pm 2.4 \text{ cm}$
Mean RVSP	$55 \pm 2.4 \text{ mmHg}$
Mean LV EF	$48.5 \pm 5.44\%$

pounded by LA dilatation, atrial fibrillation and pulmonary hypertension. The last may have an important role in LA thrombus formation by increasing RV afterload and stasis in left atrium due to the extreme hemodynamic alteration seen in mitral stenosis.⁴ Spontaneous contrast which is a precursor of clot formation was seen in 5 of the 26 cases.

LA thrombi appear as round or oval mass with clearly defined borders and broad base of attachment, many are mobile with homogeneous echodensity. At times free floating ball valve thrombus is encountered, confined by the stenosed mitral valve. Majority of thrombi which go unrecognized on transthoracic echocardiography are confined to the atrial appendage.⁵ Two of our patients had ball valve thrombus while the rest had fixed thrombi. Left ventricular systolic function was satisfactory in most of our patients.

In a study of LA thrombi by Ian W et al 86% cases had atrial fibrillation and 62% had mitral stenosis. LV dysfunction was the cause in 28% cases. In comparison 70% of our patients had atrial fibrillation and all the patients had only one cause for the thrombogenesis in the LA i.e mitral stenosis.

Although transesophageal echocardiography is superior in detecting clots in atrial append-

age, our 26 cases had clots clearly visible in LA cavity on TTE and TEE was not needed in those cases for the purpose of study. However, we could have picked up more cases of LA thrombi, may be in the earlier stage of its formation by doing TEE.⁶

The noticeable thing in this study is that severe mitral stenosis was the sole cause of thrombus formation in LA cavity. This is reflected in the small size of mitral valve area, increase in LA size and considerable degree of pulmonary hypertension that we encountered in our patients. None of our patients had mitral regurgitation which otherwise is a frequent accompaniment of mitral valve disease. This is understandable because mitral regurgitation discourages the local thrombus formation by disturbing the stasis in the left atrium.⁶

To maximize the transthoracic visualization of left atrial thrombus, the left atrium should be examined in standard parasternal long axis, apical, subcostal and para sternal short axis views with angulation of transducer to enhance the image of left atrial appendage.⁷ Atrial myxoma or a large vegetation attached to mitral valve may pose a differential in the diagnosis of LA thrombi.⁸

Onset of atrial fibrillation increases the already high risk of arterial thromboembolism in mitral stenosis and necessitates the need for optimum anticoagulation.⁹

The aim should be to detect the onset of atrial fibrillation and intracardiac clot formation in mitral stenosis at the earliest and institute definitive therapeutic measures to forestall the arterial thromboembolism.

CONCLUSION

In this study, severe mitral stenosis is the main underlying disease behind the thrombus formation in the left atrial cavity. Atrial fibrillation, left atrial dilatation and pulmonary hypertension which are the sequelae of mitral stenosis, enhance this risk.

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