

Left Atrial Posterior Wall Motion as observed in Pericardial Effusion without Tamponade

RK Gokhroo, SR Mittal, Archana Gokhroo
Institute of Cardiology, JLN Medical College, Ajmer - 305 001

Summary

Movements of left atrial posterior wall (LAPW) are routinely not visible during M-mode echocardiography but become visible in the presence of fluid posterior to left atrium. We report two cases of mild to moderate pericardial effusion showing distinct LAPW motion and we found that left atrial posterior wall motion correlates with left atrial hemodynamics (Indian J Cardiol 1999; 1-4 : 27-29)

Keywords : Left atrial posterior wall motion. Pericardial effusion.

Introduction

Posterior part of the left atrium is the only part of left atrium where movements can be best analysed by M-mode echocardiography. Rest of the walls of left atrium are not assessable to M-mode echocardiography. Parasternal long axis is the best view to record the left atrial posterior wall motions throughout its length through multiple tomographic planes. Presence of Pericardial fluid posterior to left atrium separates the atrial wall from the pericardium and makes the motion of the wall more impressively

visible. LAPW motion is important reflector of left atrial hemodynamics and changes in its motion are directly related to changes in left atrial hemodynamics in various disorders^{1,2,3}.

Case 1

Mrs. S. 42 years female presented with pain chest of one weeks duration. She was non smoker, non diabetic and normotensive. General physical examination was normal. Examination of cardiovascular

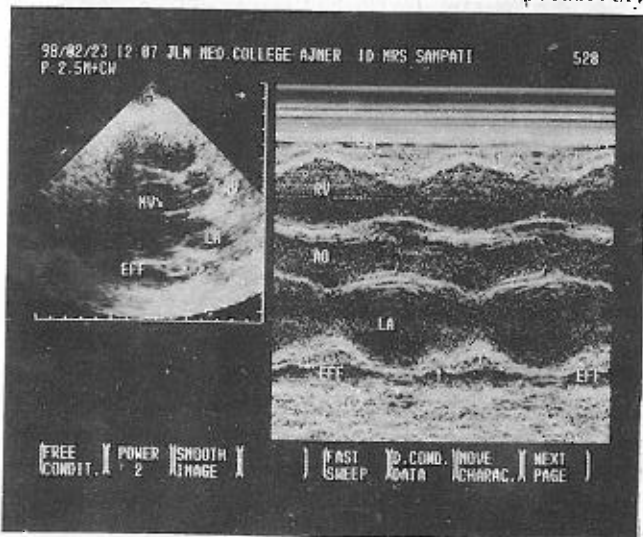


Fig. 1. Parasternal long axis view showing mild pericardial effusion and distinct left atrial posterior wall motion.

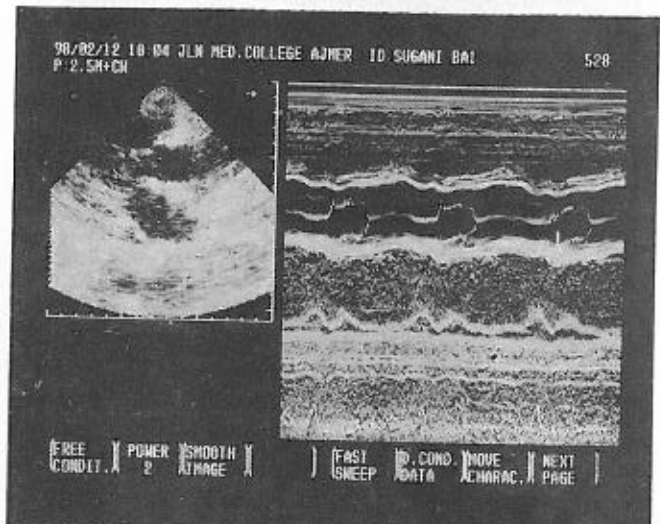


Fig. 2. Parasternal long axis view showing mild pericardial effusion and distinct left atrial posterior wall motion.

Address for Correspondence :

Dr. R.K. Gokhroo, 22/16, Sector II, Vaishali Nagar, Ajmer - 305 001.

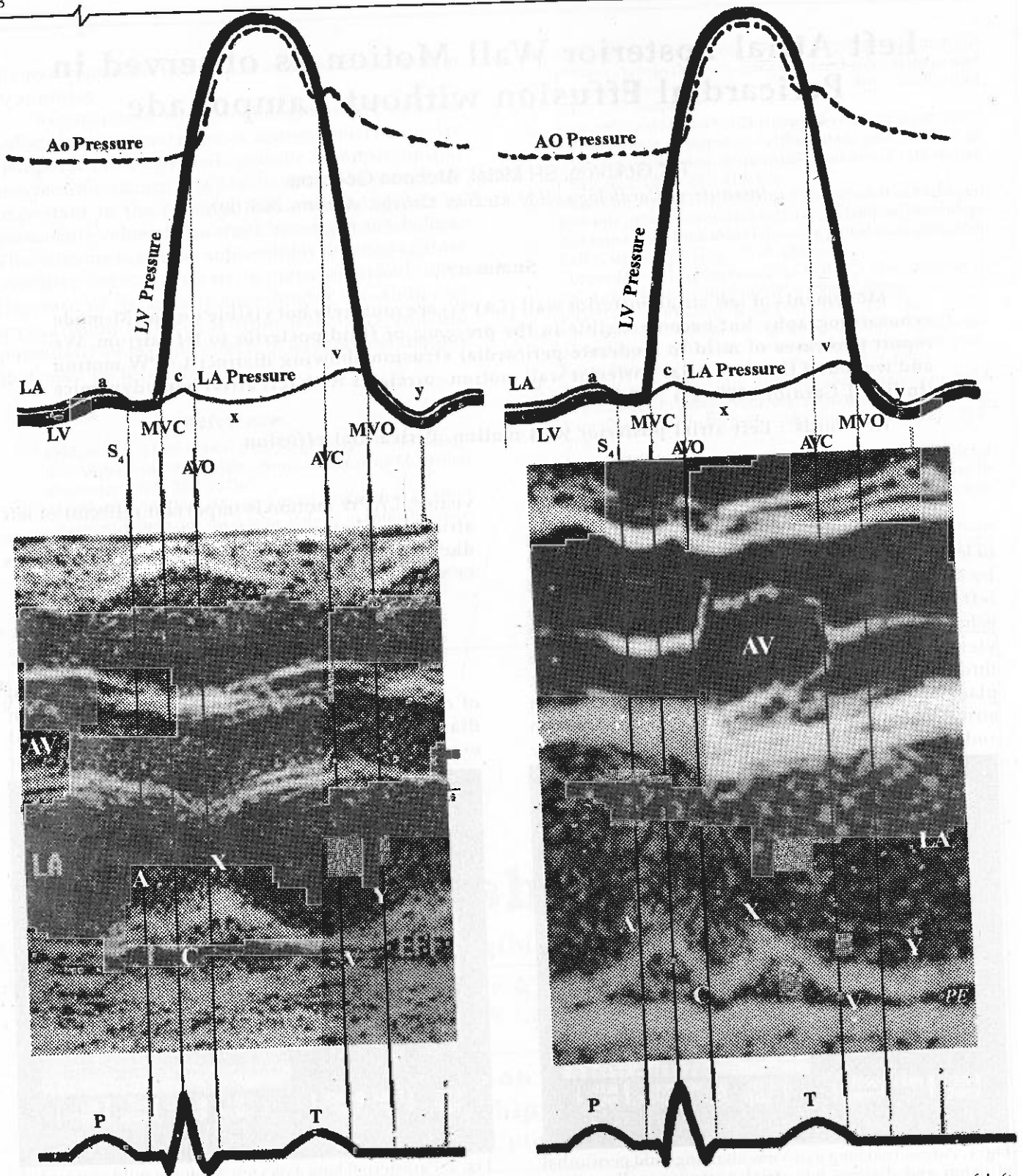


Fig. 3. Shows correlation of left atrial posterior wall motion (of both patients) with schematic representation of left ventricle, left atrial and aortic pressure pulse and electrocardiogram in case of pericardial effusion. LA = left atrium, AV = aortic valve, EFF = pericardial effusion, MVC = mitral valve closure, MVO = mitral valve opening, AVO = aortic valve opening, AVC = aortic valve closure, PE = Pericardial effusion.

system revealed normal Jugular venous pressure and loud pericardial rub. Electrocardiogram was normal. Skiagram chest showed mild enlargement of cardiac shadow. M-mode echocardiogram in parasternal long axis (figure 1) showed mild pericardial effusion posterior to left atrial posterior wall. Left atrial posterior wall showed distinct positive (marked as A, X & Y waves) & negative waves (marked as C & V waves). There was no evidence of cardiac tamponade.

Case 2

Mrs. S. 45 years female presented with pain chest for two weeks duration. She has a known case of rheumatoid arthritis. Examination of cardiovascular system was normal except the presence of loud triphasic pericardial rub. Electrocardiogram was normal. Skiagram showed enlargement of cardiac size. Parasternal long axis view (Fig. 2) showed mild pericardial effusion posterior to left atrial posterior wall. Left atrial posterior wall showed distinct positive waves (marked as A, X & Y wave) and negative wave (marked as C & V waves). There was no evidence of cardiac tamponade.

Discussion

We have correlated the electrocardiographic findings with the expected changes in left atrial pressures by superimposing the M-mode echocardiograph on the normal left atrial, left ventricle and aortic pressure tracings. (Fig. 3).

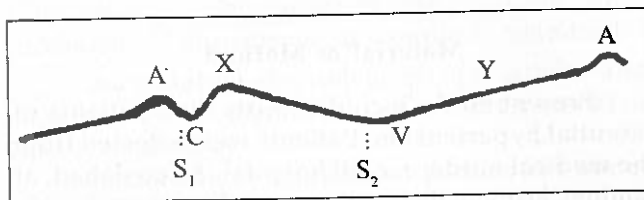


Fig. 4. Line diagram of left atrial posterior wall motion on M-Mode echocardiography in parasternal long axis view.

We have observed that "The left atrial contraction causes initial forward motion of posterior wall (marked A) following P wave of electrocardiogram and before opening of aortic valve. It correlates with "a" wave of left atrial pressure pulse. This is followed by backward motion (marked as X) as a result of atrial relaxation. Rise in atrial pressure due to bulging of mitral valve into left atrium during isovolumetric contraction phase of left ventricle transiently increased the backward motion of left atrial posterior wall (marked as C). It correlates with "c" wave of left atrial pressure pulse. This is followed by a forward motion of left atrial posterior wall as a result of fall in left atrial pressure due to descent of mitral valve apparatus during ventricular systole. This is a mirror image of x descent in systole of left atrial pressure pulse. This is followed by a backward motion of left atrial posterior wall as a result of continued passive atrial filling during ventricular systole & corresponds to ascending limb of v wave of left atrial pressure pulse. Point of maximum backward motion after it (marked as V) is a mirror image of "v" wave of left atrial pressure pulse. This is followed by forward motion of left atrial posterior wall in diastole as a result of rapid emptying of left atrium after opening of mitral valve during active ventricular relaxation (marked as Y). This is a mirror image of "y" descent of left atrial pressure pulse. "Hence in left atrial posterior wall motion we have three positive waves (marked as A, X & Y) and two negative waves i.e. marked as (C & V waves). These have been shown in figure 4 by line diagram."

Study of larger number of cases, is required to find normal variation in amplitude and duration of these waves.

References

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