ASUM Ultrasound Bulletin 2005 November; 8 (4): 38–39

# Steroid-induced left ventricular failure

*Justin O'Leary BExSc, DMU*

*Royal Prince Alfred Hospital, Camperdown, Sydney, New South Wales, Australia*
*Correspondence to J O'Leary email Justin_Oleary@hotmail.com*

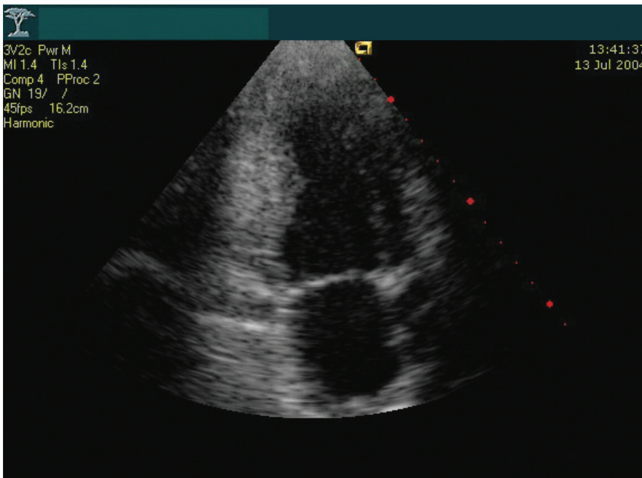


**Figure 1 Parasternal long axis image of the left vertrical and left atrium demonstrating mild left ventricular systolic impairment with normal antero-septal regional wall motion and posterior hypokinesia**

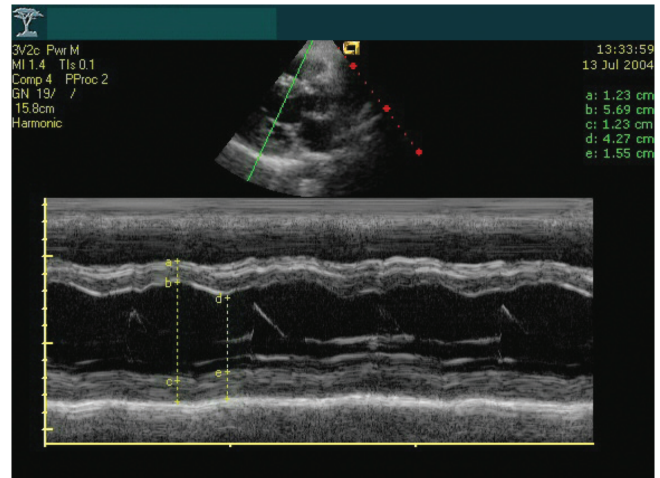


**Figure 2 Parasternal left ventricular long axis M-mode demonstrating mild concentric hypertrophy and mild ventricular dilation with posterior hypokinesia**

## Clinical history

A 34-year-old male presented with a two-day history of central, non-radiating chest pain. ECG on admission showed ischaemic changes in the inferior and lateral leads. There was also evidence of myocardial damage in the cardiac enzymes (CK: 1375 u/L [normal range less than 200] and Troponin: 0.56 mcg/L [normal range less than 0.1 mcg/L]). On examination the patient was fit, normotensive non-smoker with a muscular build and with no family history of cardiac disease who self-administered anabolic steroids. An echocardiogram was requested to assess left ventricular function.

## Materials and methods

An Acuson Cypress was used with a multi-frequency (1.5 – 3.0 MHz) phased array transducer with real time 2D (harmonic and non-harmonic), M-mode, colour flow, continuos and pulsed wave Doppler examination. A frequency of 1.7 MHz with harmonic imaging was selected for adequate penetration and resolution. Depth settings, focal zones, overall gain, TGC, colour and spectral Doppler settings were adjusted for optimum resolution. The mechanical index (MI) was 1.4 and the thermal index (TI) was 0.7–1.5. The total imaging time was 30 minutes.

## Technique

The parasternal long axis view of the left ventricle showed moderately impaired systolic contraction with normal antero-septal wall contraction and severe posterior hypokinesis (Figure 1). The left ventricular walls appeared concentrically hypertrophied. The mitral and aortic valves appeared normal with normal excursion. The M-mode through the aortic valve demonstrated a normal sized aortic root and left atrium. The aortic valve cusp separation was normal.

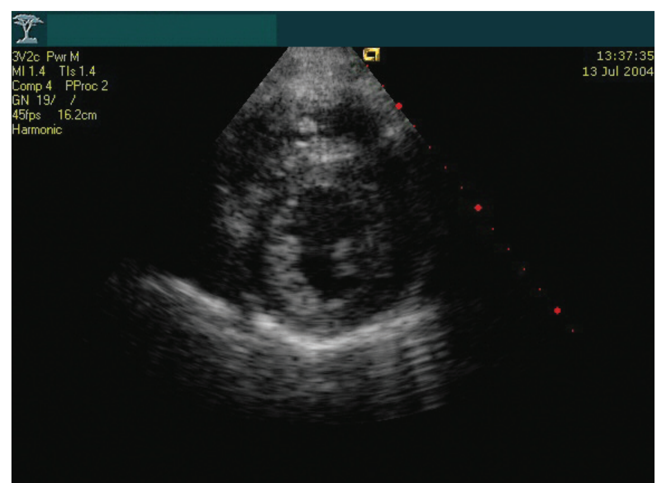


**Figure 3 Parasternal short axis view of the left ventricle demonstrating mild concentric hypertrophy, posterior hypokinesia and mild cavity dilation**

M-mode through the left ventricle shows a mildly increased left ventricular end-diastolic dimension and reduced systolic thickening of the posterior wall (Figure 2). There was mild concentric left ventricular hypertrophy. Colour Doppler revealed no aortic or mitral regurgitation.

The right ventricular inflow view showed a normal tricuspid valve with normal valve excursion. The right atrium appeared normal in size. Colour Doppler revealed trivial tricuspid regurgitation. The right ventricular outflow tract and pulmonary valve appeared normal and the colour Doppler



WFUMB 2006 SEOUL

and continuous wave Doppler across the pulmonary valve showed normal outflow velocities.

The parasternal short axis view confirmed normal pulmonary, mitral and aortic valve leaflets with no aortic regurgitant jet and trivial tricuspid regurgitation. The left ventricle visualised at the level of the papillary muscles showed hypokinesis impairment in systolic function.

Apical views confirmed the mitral valve and tricuspid valves to have normal excursion with normal left and right ventricular wall motion and normal atrial size. Colour Doppler of the mitral valve showed physiological mitral regurgitation and normal tricuspid and aortic flow.

The 2-chamber view showed a normal anterior wall but the inferior wall motion was moderately impaired with severe posterior wall dysfunction.

The subcostal 4-chamber view showed no evidence of pericardial effusion and colour Doppler across the interatrial septum shows no sign of an interatrial septal defect. There was a normal sized IVC with normal respiratory collapse (RAP = 5–10 mmHg). Subcostal short-axis views of the left ventricle confirmed mild segmental left ventricular impairment with posterior hypokinesia and moderate impairment of left ventricular function (Figure 3).

Suprasternal views showed a normal sized aortic arch diameter with normal descending aortic flows.

## Discussion

The echocardiogram revealed a left ventricle that was upper normal size with mildly increased concentric wall thickness. The left ventricular function was mildly impaired with segmental dysfunction. There was basal to mid inferior and inferolateral hypokinesis and posterior akinesis. The thickness of the myocardium and the clinical settings suggested this was a recent infarct. The remainder of the ultrasound examination was essentially normal with normal sized atria and normal cardiac valves and Doppler flows.

A coronary angiogram showed a tight stenosis of the mid circumflex artery, which was dilated, and stented with a drug eluting stent. The patient was advised to avoid anabolic steroids as it was likely that their use had contributed to the premature development of coronary atherosclerosis.

WFUMB 2006 SEOUL World Federation for Ultrasound in Medicine and Biology