

Training to failure

A 34-year-old professional bodybuilder was admitted with a 2-week history of progressive breathlessness. Upon assessment he was clinically in pulmonary oedema (*Figure 1*). An electrocardiogram showed marked left ventricular hypertrophy (Sokolow–Lyon index 6.0 mV). Echocardiography revealed severely impaired left ventricular function (ejection fraction 10%) with moderate, likely functional, mitral regurgitation. Right ventricular function was preserved with raised pulmonary pressures at 55 mmHg.

The patient admitted taking anabolic steroids in preparation for a recent bodybuilding competition. He responded well to diuretics and was subsequently commenced on conventional heart failure therapy. A repeat echocardiogram, abstinent from steroid use, showed improvement in his left ventricular function (ejection fraction 40%) post discharge.

Anabolic steroids cause impaired left ventricular function in a high proportion of users (Baggish et al, 2010), with comorbidities of left ventricular hypertrophy, hypertension and dyslipidaemia (Payne et al, 2004).

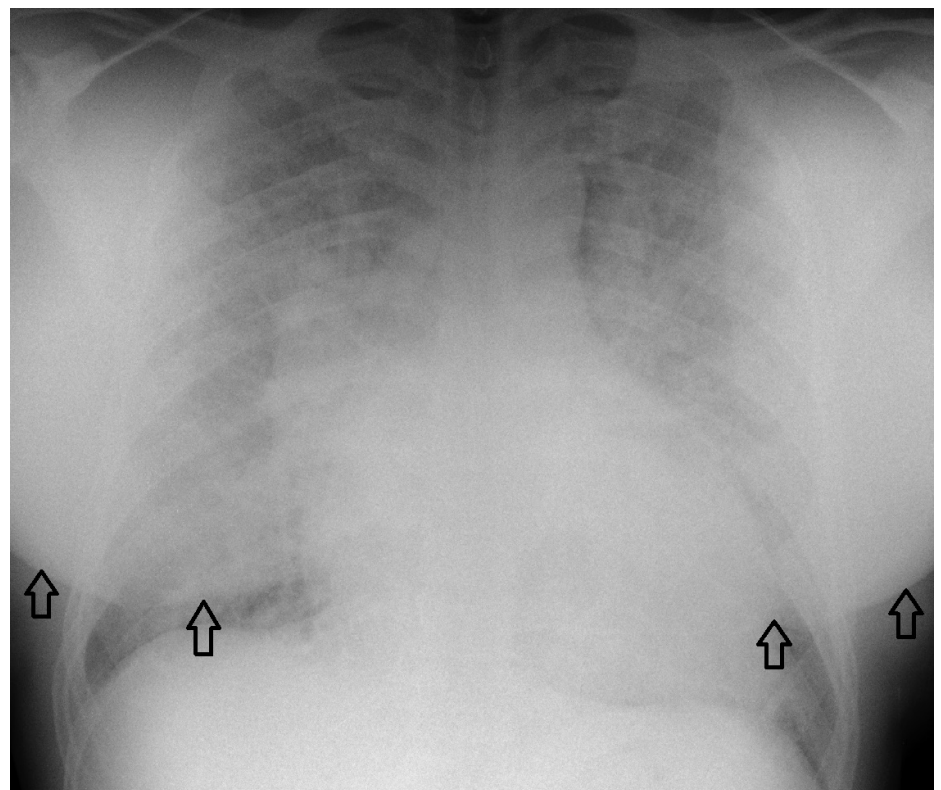
In addition to anabolic steroids, many bodybuilders take other performance-enhancing compounds, such as diuretics (muscle definition), clenbuterol (fat metabolism), testosterone (testicular preservation), thyroxine (weight loss), tamoxifen (inhibits gynaecomastia), insulin and growth hormone (enhance muscle growth) (Dawson, 2001). Most are being used illicitly with participants likely to deny use, making the impact of these drugs on cardiac function difficult to estimate. **BJHM**

Baggish AL, Weiner RB, Kanayama G, Hudson JI, Picard MH, Hutter AM Jr, Pope HG Jr. Long-term anabolic-androgenic steroid use is associated with left ventricular dysfunction. *Circ Heart Fail.* 2010 Jul 01;3(4):472–476. <https://doi.org/10.1161/CIRCHEARTFAILURE.109.931063>

Dawson R. Drugs in sport - the role of the physician. *J Endocrinol.* 2001 Jul 01;170(1):55–61. <http://joe.endocrinology-journals.org/content/170/1/55.full.pdf>. <https://doi.org/10.1677/joe.0.1700055>

Payne JR, Kotwinski PJ, Montgomery HE. Cardiac effects of anabolic steroids. *Heart.* 2004 May 01;90(5):473–475. <https://doi.org/10.1136/hrt.2003.025783>

Figure 1. Admission chest X-ray showing cardiomegaly and pulmonary oedema. Note the massive pectoral muscle development (black arrows).



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