Anabolic Androgenic Steroid Use Leading to Isolated Left Anterior Descending Artery Thrombosis

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Abstract (300 word limit)

Case Presentation: A 47-year-old male with no past medical history presented with sudden severe left-sided pressure-like chest pain. Family history was unremarkable for sudden cardiac death or early myocardial infarction. He had no personal history of illicit drug use, smoking, or alcohol intake. He reported 2-year use of injectable anabolic steroids for non-competitive bodybuilding and recreational hockey. Admission vital signs were stable and physical examination was unremarkable. Electrocardiogram showed ST segment elevation in leads V2-V6, aVL and troponin at 80.88ng/mL concerning for anterolateral ST elevation myocardial infarction. Urine drug screen was negative and TSH, lipid panel, and HBA1C were normal. Transthoracic echocardiogram revealed a hypokinetic anteroseptal and apical region with no evidence of atrial or ventricular thrombus. Emergent coronary angiogram revealed an isolated 100% occlusion at the mid-left anterior descending artery, where a drug-eluting stent was placed after balloon angioplasty and aspiration thrombectomy. He was discharged in stable condition and advised to discontinue use of testosterone supplements. On follow-up 2 weeks later, he remained chest pain free and reported ability to do light weight lifting. **Discussion:** Anabolic androgenic steroids (AAS), synthetic derivatives of testosterone, are commonly used by athletes and bodybuilders. The anabolic effect leads to protein synthesis, muscle growth, and erythropoiesis. Limited studies are available on the effect of AAS on human health due to underreported use. Myocardial infarction is a rare complication of AAS use. AAS may induce myocardial infarction through thrombosis, atherogenesis, or vasospasm. AAS can reduce HDL and increase LDL leading to accelerated atherosclerosis. Vasospasm can occur with inhibition of guanylate cyclase. AAS-driven increase in platelet aggregation promoter, thromboxane A2, and decrease in platelet aggregation inhibitor, prostacyclin, are postulated mechanisms for thrombosis. This case highlights how the use of AAS supplements does not come without risk and may lead to life threatening complications.

Image

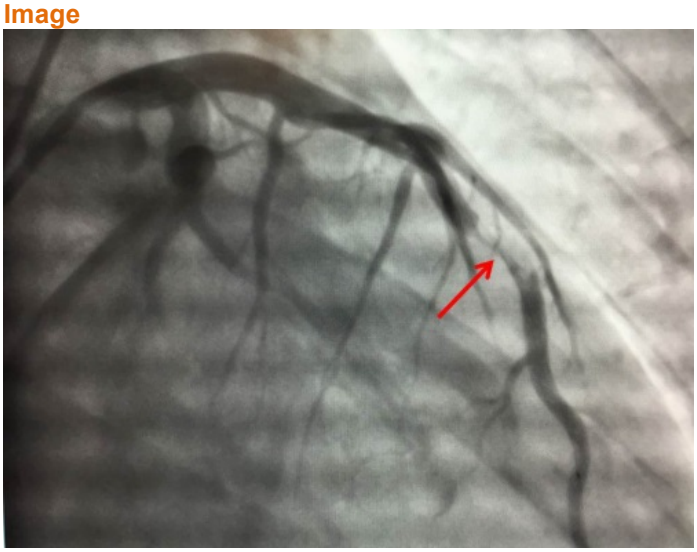


Figure 1. Coronary angiogram showing a 100% occlusion of mid-left anterior descending artery (arrow)

Recent Publications

1. Christou GA, Christou KA, et al. (2016) Acute myocardial infarction in a young bodybuilder taking anabolic androgenic steroids: A case report and critical review of literature. Eur J Prev Cardiol 23(16):1785-1796.
2. Santos RP, Pereira A, et al. (2015) Anabolic Drugs and Myocardial Infarction – A Clinical Case Report. Arq Bras Cardiol 105(3):316-9.
3. Payne JR, Kotwinski PJ, et al. (2004) Cardiac effects of anabolic steroids. Heart 90(5):473-5.
4. Stergiopoulos K, Brennan JJ, et al. (2008) Anabolic steroids, acute myocardial infarction and polycythemia: a case report and review of the literature. Vasc Health Risk Manag 4(6):1475-80.
5. Achar S, Rostamian A, et al. (2010) Cardiac and metabolic effects of anabolic-androgenic steroid abuse on lipids, blood pressure, left ventricular dimensions, and rhythm. Am J Cardiol 106(6):893-901.



Biography (150 word limit)

Joanne Michelle D. Gomez, M.D. is a third year Internal Medicine resident at Rush University Medical Center in Chicago, IL, USA. Her research interest is in the prevention and treatment of cardiovascular diseases that remain the No. 1 cause of mortality in both developed and developing nations. Her research focus is on cardiovascular disease risk assessment, women's health, and identification of high-risk populations. She is a strong advocate in increasing awareness on the prevalence of cardiac disease among women and racial minorities. One of her publications is a study on the genotype distribution of single-nucleotide polymorphisms associated with hyperlipidemia, proprotein-convertase subtilisin-kexin type 9 (PCSK9) and low density lipoprotein receptor (LDLR), and association with statins in the high-risk Filipino American Women; a work that has been presented in various national conferences in the United States.

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Notes/Comments