Case Report

Aortic Dissection in a Young Male Body builder Requiring Complex Repair

Emily Stevens*, Hansraj Riteesh Bookun*, Alexandra Matthews*, Chin Siew Lee*, Andrew Cheng*, Mayur Krishnaswamy*.

Junior Doctor , The Geelong University Hospital, Geelong, Australia

Emily Stevens is a junior doctor working at Western Health, Melbourne, Australia. She graduated from Deakin University, Geelong, in 2015. Emily aims to provide the best care for her patients locally and contribute to the greater scientific community in the form of research and redesign, globally. Emily developed a keen interest in vascular surgery as a medical student and accordingly, is pursuing a surgical career. She is concurrently involved in multiple research projects across the fields of neurology and radiology.

Corresponding author - Dr. Hansraj Riteesh Bookun (riteeshbookun@hotmail.com)

Chettinad Health City Medical Journal 2016; 5(1): 45 - 47

Abstract

We present here a case of thoracic aortic dissection requiring complex open and endovascular repairs in a 41 year old male bodybuilder in the context of recreational use of a sports supplement, Res 100, which is marketed as an anabolic steroid agent. He did not suffer from hypertension, aortic coarctation or atherosclerosis. He did not have any pre-existing aortic aneurysm or congenital aortic valve defects and had neither evidence of Marfan's nor Turner's syndrome. Genetic testing for chromosomal abnormalities was negative. Laboratory testing did not support inflammatory or infectious conditions. Additionally, the mean age of patients with acute aortic dissection is 62 years old as per the International Registry of Acute Aortic Dissection, which is in contrast with our patient's 41 years of age. However, anectodal reports of dissection in bodybuilders feature ages ranging from 19 to 53 years old. These reports also found strenuous activity to precede dissection, our case demonstrates symptom onset during minimal exertion and a potential link to performance enhancing drugs. This case highlights the variability in the risk factor profile for aortic dissection pathology.

Key Words: Aortic Dissection, Body Buiders, Res 100

Case Report

A 41-year-old male weightlifter presented to the emergency department after experiencing chest pain radiating to his jaw whilst vacuuming, on the background of recreational use of 'Res 100', a compound used by bodybuilders to increase autologous testosterone and inhibit oestrogen. He was otherwise well with no history or family history of aortic disease. His blood pressure was initially 169/92 mmHg with the rest of his vital signs being within normal limits.

Echocardiogram revealed an aortic dissection rupturing into the pericardium with tamponade. CT angiography demonstrated extensive aortic dissection involving the ascending aorta, arch and the descending aorta; and ending at the renal arteries (Fig1). There were no radiological or clinical signs of compromised perfusion distally.

He underwent emergency surgery for an ascending aortic repair an hour later. Cannulation for cardiopulmonary bypass was via the right femoral artery and vein. His pericardial effusion was evacuated. A primary tear was identified within the proximal ascending aorta and no intimal tear was seen within the arch. The ascending aorta was replaced with a 30mm Dacron graft, with resuspension of the aortic valve. On table DSA then revealed adequate perfusion of cerebral and visceral segments via the true lumen.

On his first post-operative day, increasing lactate and creatinine levels were noted and a CTA was performed which showed near total obliteration of the true lumen in the proximal descending aorta due to a pressurised false lumen.

He was returned to the operating theatre and had a redo median sternotomy with debranching of the innominate and left common carotid arteries from the ascending aortic graft to provide a sufficient landing zone for a stent graft. A thoracic endovascular stent graft was deployed from within the ascending aortic graft to the mid-descending thoracic aorta. An uncovered self-expanding stent was deployed down to the origin of the coeliac axis to scaffold the true lumen. He was then transferred to the intensive care unit in a haemodynamically stable state. Subsequently, his visceral perfusion stabilised. The patient was discharged home three weeks postoperatively.

Discussion

Aortic dissection is a rare and potentially lethal condition. A tear in the aortic intimal layer creates an intramural lumen into which high velocity blood flow can track, creating a false lumen, capable of causing severe morbidity and mortality[1,2]. Known risk factors for this condition include connective tissue abnormalities and/or systemic hypertension[1,3]. More recent associations include strenuous activities and substance abuse[4-6].

There is a large evidence base correlating strenuous activities with aortic dissection. Extreme haemodynamic loading is observed in activities such as weightlifting where blood pressure has been reported to reach 480/350 mm Hg[5]. Elefteriades et al, demonstrated acute aortic dissection in the setting of strength training in men aged19-53[3]. Additionally, multiple case reports describe aortic dissection in otherwise healthy adult male body-builders[7-14] and one case report has

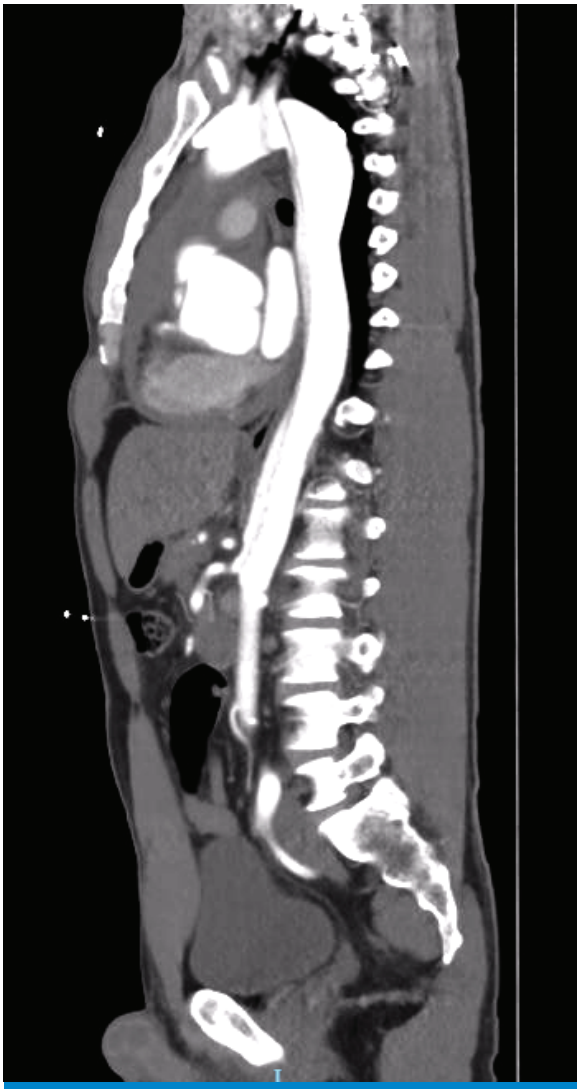

Fig 1: CT angiography demonstrated extensive aortic dissection involving the ascending aorta, arch and the descending aorta; and ending at the renal arteries

highlighted concurrent performance enhancing substance use[15]. Iskander et al, found that whilst aortic disease is rare and an infrequent cause of mortality in elite athletes, extreme haemodynamic loading can cause aortic dilatation with severe sequelae, suggesting patients with genetic susceptibility be advised to avoid vigorous activities[16]. Similarly, Aparci et al, described a relationship between strenuous occupations (ie military, weight-lifting, security) and aortic dilatation, which predisposing to aortic dissection, suggesting pre-employment screening and monitoring to improve safety as these occupations may be implicated in the development of aortic disease[17].

This case describes a patient with an unusual history and presentation. He is young, with no history of aortic disease or hypertension. He was 41 years of age at onset in contrast with IRAD's average age of 62 years. His onset of symptoms occurred with minimal exertion and he was concurrently taking a testosterone supplement. This case also highlights the appropriate combination of cardiac surgical and endovascular skills to culminate in a good outcome in a time period where branched stent grafts are not available for the arch.

References

1) Hagan PG, Nienaber CA, Isselbacher EM, Bruckman D, Karavite D J, Russman PL, Eagle KA. The International Registry of Acute Aortic Dissection (IRAD). Jama. 2000;283(7): 897.

2) Mayerick C, Carré F, Elefteriades J. Aortic dissection and sport: physiologic and clinical understanding provide an opportunity to save young lives. The Journal of Cardiovascular Surgery. 2010; 51(5): 669–81.

3) Elefteriades JA, Hatzaras I, Tranquilli MA, Elefteriades AJ, Stout R, Shaw RK, Barash P. Weight lifting and rupture of silent aortic aneurysms. JAMA. 2003; 290(21):2803.

4) Hatzaras I, Tranquilli M, Coady M, Barrett PM, Bible J, Elefteriades JA. Weight lifting and aortic dissection: more evidence for a connection. 2007;107(2):103-6.

5) Fred HL. More on weightlifting injuries. Texas Heart Institute Journal / from the Texas Heart Institute of St. Luke's Episcopal Hospital, Texas Children's Hospital, 2014;41(4):453–4.

6) Fikar CR, Koch S. Etiologic factors of acute aortic dissection in children and young adults. Clin.Pediatr.(Phila).2000; 39(9): 71–80.

7) Aghasadeghi K, Aslani A. Spontaneous coronary artery dissection in a professional body builder. International Journal of Cardiology.2008; 130(3): e119–20.

8) Ahmadi H, Shirani S, Yazdanifard P. Aortic dissection type I in a weightlifter with hypertension: A case report. Cases Journal. 2008; 1(1): 99.

9) Ciocca, R. G., Costibile, J. P., & Graham, A. M. Descending aortic dissection in an elderly weight lifter: A case report. Vascular Surgery, 1997; 31(2): 193–197.

10) El-Sherief, K., Rashidian, A., & Srikanth, S. Spontaneous coronary artery dissection after intense weightlifting UCSF Fresno Department of Cardiology. Catheterization and Cardiovascular Interventions: Official Journal of the Society for Cardiac Angiography & Interventions, 2011; 78(2): 223–227.

11) Hogan, C. J. An aortic dissection in a young weightlifter with non-Marfan fibrillinopathy. Emerg Med J, 2005; 22(4): 304–305.

12) Hountis, P., Dedeilias, P., & Bolos, K. Acute aortic dissection in a young patient without Marfan fibrillinopathy: a case report. Cases Journal, 2009;2: 7076.

13) Ragucci, M. V., & Thistle, H. G. Weight lifting and type II aortic dissection: A case report. Journal of Sports Medicine and Physical Fitness, 2004;44(4): 424–427.

14) Schor, J. S., Horowitz, M. D., & Livingstone, A. S. Recreational weight lifting and aortic dissection: case report. Journal of Vascular Surgery, 1993; 17(4): 774–6.

15) Low, A., Dovey, J., & Ash-Miles, J. Vertebral artery dissection in weightlifter with performance enhancing drug use. BMJ Case Reports, 2011.

16) Iskandar, A., & Thompson, P. D. Diseases of the Aorta in Elite Athletes. Clinics in Sports Medicine, 2015; 34(3): 461–72.

17) Aparci, M., Erdal, M., Isilak, Z., Yalcin, M., Uz, O., Arslan, Z., & Kardesoglu, E. Enlargement of the aorta: An occupational disease? Experimental and Clinical Cardiology, 2013;18(2): 93–7.

Just Like adults

Prevailing understanding is that the adults and the children are different when it comes to making moral judgements. The adults appear to give greater emphasis to intention rather than the outcome of an action. For example, hurting someone intentionally is considered morally worse than accidentally doing the same. But the children are believed to base their moral judgements on the outcome of an action rather than on intention. But this has been challenged in a recent study involving 138 children aged between 4 and 8 and 31 adults in which the study subjects were told, and questioned about, four stories about accidental (good intention/bad outcome) and attempted (Bad intention/good outcome) harms; but unlike in earlier studies, the authors rephrased the acceptability questions. The results were dramatically different from the earlier conclusions. Children above the age of 4 made moral judgements much like adults i.e. they too based their judgments on intention than on outcome.

Cognition, doi: 10.1016/j.cognition.2016.08.019, published 17 September 2016.

- Dr. K. Ramesh Rao

Answer to : **Diagnose the condition**

ECG shows bradycardia with obvious QRS complexes at the rate of 30/min. Possibility could be a Junctional rhythm but with low rate.No obvious sinus P waves are seen. But retrogradely conducted P wave can be seen after each QRS complex. These features are suggestive of complete Sinus Arrest (SICK SINUS SYNDROME) with escape rhythm.This patient did not respond to Atropine. Probably the site of impulse generation is His bundle.

Dr. M.Chokkalingam, Consultant Cardiologist, CSSH.