SAR Journal of Medical Case Reports

Abbreviated Key Title: *SAR J Med Case Rep*
Home page: https://sarmedjournals.com

ISSN 2707-7780 (P)
ISSN 2709-6947 (O)

Case Report

Abdominal Aortic Aneurysm with Imminent Rupture in an Elderly Patient: A Case Report

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Article History: | Received: 04.09.2020 | Accepted: 27.09.2020 | Published: 30.10.2020 |

Abstract: Abdominal aortic aneurysm (AAA) occurs mostly in the infrarenal component of the abdominal aorta (AA) when the diameter of the AA increases from 1.7cm in men and 1.5cm in women to a diameter greater than 3.0cm; this is clinically regarded as aneurysmal. This shows a male preponderance, with age greater than 65 years and common in individuals of European ancestry. This is a 70-year-old retired civil servant and known hypertensive that presented for a computed tomographic angiography (CTA) on account of a pulsatile mass in the mid abdomen. The CTA showed a contrast filled left laterally oriented saccular mass in the infrarenal aspect of the AA measuring about 108mm x 95mm in craniocaudal and mediolateral dimensions. This mass shows a left lateral projection; the nipple or crescent sign of imminent rupture, and a cleft like filling defect posterior and left laterally; thrombus fissuration sign of imminent rupture. A diagnosis of AAA with imminent rupture was made. The patient was placed on medical treatment among which is anticoagulant and antihypertensive therapy with preparation for surgical treatment but he opted for surgical treatment abroad. We report the radiologic findings of AAA with imminent rupture following CTA in an elderly male due to its peculiar presentation and rare nature.

Keywords: Imminent rupture, Nipple, Infrarenal component, Angiography.

INTRODUCTION

Abdominal aortic aneurysm (AAA) is regarded as the 13th commonest cause of death in the United States of America, attempt in identification and management of symptomatic cases is important, as is prevention in those cases at risk [1, 2]. The asymptomatic cases are far more commonly encountered than the symptomatic patients in clinical practice, with symptom development occurring as a late clinical finding, prevention focuses on identification of associated risk factors and reducing modifiable ones [1, 3, 4].

The aorta is the largest artery in the body; this carries oxygenated blood from the heart and eventually to various parts of the body through systemic circulation, and has a diameter of about 2.0cm as it passes through the abdominal cavity. The abdominal portion may occasionally become dilated, weakened with stress on the aortic wall, this is referred to as an abdominal aortic aneurysm and has a 90% risk of causing death when it ruptures (Center for Disease Control and Prevention, 2011)[5].

Abdominal aortic aneurysm is more preponderant in the male gender, and those aged greater 65-years of age especially those belonging to the European ancestry [4, 8, 9]. The effect of the sex hormone estrogen is believed to play a protective role against cardiovascular diseases in premenopausal women; this protective mechanism may also delay AAA in women [5, 10].

The prevalence of AAA in those aged 65 years is about 5-10% in men and 0.5-1.3% in women, these increases in prevalence with each decade of life [11, 12].

The incidence of AAA is reported to be lower in women, but it is important of note that the tendency and risk of AAA to rupture is higher in women who develop AAA [5-7].

An arterial aneurysm is further defined as a focal dilatation of any blood vessel with respect to the main artery, abdominal aortic aneurysm has varying risk factors among which are age greater 60 years, hypertension, smoking and Caucasian ethnicity [13]. Atherosclerosis of the coronary arteries, arteriosclerosis obliterans and family history are also predisposition factors to AAA [13-15], although AAA has been found to be less common in individuals with diabetes [13, 16].

Body mass index greater 25 is also regarded as a risk factor for AAA, however a negative association between development of AAA existed between certain heart healthy lifestyle behaviors like exercise once weekly, consumption of fruits, vegetables, and nuts more than thrice every week, these are also beneficial to individuals with coronary heart disease [5, 17].

Approximately about 30% of asymptomatic cases are diagnosed as pulsatile abdominal mass on routine physical examination [13].

The biggest or worrisome concern for abdominal aortic aneurysm is the tendency to rupture and cause major internal bleeding which can be fatal; a ruptured AAA is indeed a surgical emergency [18, 19].

In acute AAA rupture, it has been estimated that about 50% of individuals die before reaching hospital, and of those who arrive a hospital, approximately 50% will not survive emergency surgical repair of the rupture [5, 13].

Features of AAA rupture on CTA are basically regarded as intramural signs; these are increased aneurysm size, rapid enlargement rate, focal wall discontinuity, hyperattenuating crescent sign, and thrombus fissuration and draped aortic sign [20].

CASE REPORT

This is a 70-year-old retired civil servant that is a known hypertensive referred for a CTA on account of a pulsatile mid abdominal mass with non-radiating epigastric abdominal pain noticed for about 2-months duration.

The patient had no similar occurrence in the past, he neither drinks alcohol nor smoke cigarrete but occasionally takes kolanuts and caffeine, he also confessed not to engage in physical exercise. No family history of similar illness, he is not a known diabetic patient and has a BMI of less than 20. No history of renal or coronary artery disease. But past medical history had a suspicion of chronic obstructive pulmonary disease.

The patient is conscious and oriented, not cachectic, not pale, not dehydrated, not jaundiced, and had some degree of finger clubbing, in mild respiratory difficulty and not in painful distress.

The patient had a blood pressure of about 145/110mmHg, heart rate of 72 beats/minute, and respiratory rate of about 17 cycles/minute, body temperature of 37 degrees Celsius and pulse oximetry of about 83% in room air.

The CTA showed an infrarenal AAA in the anterior and left lateral aspect of the abdominal aorta measuring about 108mm x 95mm in craniocaudal and mediolateral dimensions, this also showed a superior and left lateral projection; the nipple or hyperattenuating crescent sign of imminent rupture with an inferior left lateral cleft-like filling defect or thrombus fissuration of imminent rupture with bilateral shouldering of the inferior aspect of this dilated aneurysmal dilatation.

A complimentary ultrasonography done and also showed an infrarenal dilated abdominal aorta with a left lateral mass-like structure measuring about 90mm x 75mm in craniocaudal and mediolateral dimension; this area showed a left superior and lateral projection the nipple of imminent rupture of AAA. No perilesional fluid is noted. The remaining organs showed normal appearances sonographically.

Plain chest radiograph showed hyper-inflated lung fields with flattened and low-set hemi-diaphragms, associated streaky opacities with cystic lung changes raising a suspicion of chronic bronchitis with emphysematous changes as components of chronic obstructive pulmonary disease.

A diagnosis of AAA with features of imminent rupture in an elderly male patient with some associated risk factors was established.

The patient was placed on antihypertensives, anticoagulant therapy, and anxiolytics with anti-inflammatory agents and bronchodilators. The patient was however advised on surgical treatment; endovascular surgery for repair of the aneurysm to prevent rupture, the patient however opted for further treatment abroad.

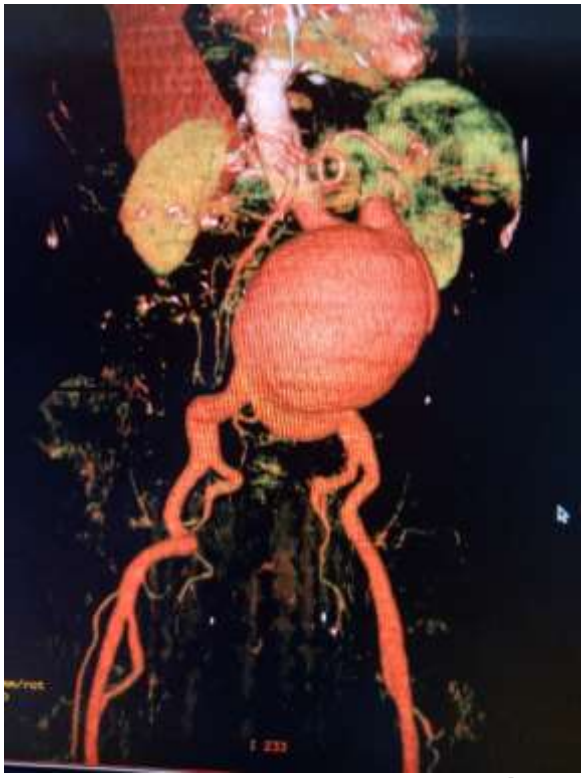

Fig-1: A maximum intensity projection; MIP: shows a fusiform dilatation of the infrarenal component of the abdominal aorta in the left lateral aspect of the aorta. A superior and left lateral projection; the crescent sign of imminent rupture. The distal and terminal branches of the aorta appear within normal limits,

Fig-2: A contrast series of CTA, the reconstructed coronal view showing a saccular dilatation of the infrarenal component of abdominal aorta in the left lateral aspect of the aorta measuring about 108mm x 95mm with a superior and left lateral projection; the crescent or nipple sign of imminent rupture

Fig-3: Axial image of CTA at the level of the kidneys showing a dilated and contrast filled abdominal aorta with bilateral shouldering and mild periaortic fat stranding, no periaortic fluid to denote rupture

Fig-4: Reconstructed sagittal view of CTA showing saccular dilatation of the abdominal aorta. Degenerative changes are noted on the demonstrated spine conforming to advanced age of the patient

Fig-5: Axial view of CTA at the level of the kidneys showing a contrast filled oval dilated abdominal aorta with a left lateral cleft-like filling defect; the thrombus fissuration sign of imminent rupture of AAA

DISCUSSION

An arterial aneurysm is defined as a focal dilatation of the aorta of more than 50% of its expected diameter [20, 21], the index case had dilatation of the infrarenal component of the abdominal aorta with a left lateral mass-like structure measuring about 108mm x 95mm in diameter.

Abdominal aortic aneurysm is more preponderant in the male gender, and those aged greater 65-years of age especially those belonging to the European ancestry [4, 8, 9]. The index case is a male patient, aged 70-years but belong to the African ancestry.

Atherosclerosis of the coronary arteries, arteriosclerosis obliterans and family history are also predisposition factors to AAA [13-15], although AAA has been found to be less common in individuals with diabetes [13, 16]. The patient under review has no medical history of coronary atherosclerosis, arteriosclerosis obliterans, family history and diabetes thereby conforming to these literatures.

Approximately about 30% of asymptomatic cases are diagnosed as pulsatile abdominal mass on routine physical examination [13], the index case was not an exception, he was initially asymptomatic but later presented with a pulsatile abdominal mass, thereby conforming to this literature.

The biggest or worrisome concern for abdominal aortic aneurysm is the tendency to rupture and cause major internal bleeding which can be fatal; a ruptured AAA is indeed a surgical emergency [18-20]. The index case has features of imminent rupture, these are increased aneurysmal size, the hyperattenuating crescent sign (with sensitivity and specificity to detect AAA rupture in about 77 and 93 respectively) [22, 23] and thrombus fissuration.

Rupture of AAA often occurs at the end of a continuum of growth and wall weakening, imaging findings of AA rupture are categorized on location and are either; the intramural findings which are highly suspicious of impending rupture, the luminal and extraluminal imaging features suggest complete rupture of an AAA [20], the index had only intramural findings on imaging some of which are size of the AAA and hyperattenuating crescent sign of impending rupture conforming to this literature.

The most important determinant to AA rupture is its size, with increased wall tension following increase in vessel radius by Laplace wall, however AAA with diameter of more than 8cm have a 30-50% risk per year of rupture [20,24], the index case has a mediolateral diameter of about 9.5cm and showed features of imminent rupture thereby conforming to these literatures.

An aortic aneurysm with impending rupture may sometimes not present any imaging features, painful AAA in the absence of CT imaging features may indicate impending rupture and also require urgent repair[20], the index case that a painful pulsatile mid abdominal mass, and also had imaging findings of impending rupture of the AAA.

Abdominal aortic aneurysm, according to most researchers [1-21] are diagnosed by imaging, these are basically abdominal ultrasonography and CTA, these determine the location, size and features of imminent or contained and eventual rupture of the AAA in most cases. The case under review was also diagnosed by ultrasonography and CTA of the abdomen where an infrarenal dilated AA with features of imminent rupture was diagnosed conforming to that reported by researchers.

Management of AAA is both by medical and surgical treatment, most instances the medical treatment is directed at cause and associated risk factors like anti-hypertensives, anti-hyperlipidemia and cholesterol reducing drugs, alpha and beta-blockers to mention but a few. The surgical management is either open surgical repair or endovascular surgery for repair of the aneurysm [20, 25, 26], the index case also had some form of medical management but opted for surgical repair abroad, thereby conforming to that documented in most literatures.

CONCLUSION

Patients presenting with pulsatile abdominal mass should be immediately investigated with abdominal ultrasonography and CTA to rule out AAA and anticipated complications like imminent rupture for immediate institution of management, and to save the lives of these individuals.

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