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Visual Case Discussion

Abdominal aortic aneurysm associated with a retroperitoneal hematoma

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A 64-year-old male smoker with no known past medical history (had not seen a physician in over 30 years) presented to the Emergency Department with three days of bilateral lower back/ buttocks pain radiating down his left leg. The patient reported a possible syncopal episode two days prior. He is a current smoker of 53 years, smoking 1 pack/day. He denied chest pain, shortness of breath, abdominal pain, bowel or bladder in continence. At triage, blood pressure was 129/96, heart rate was 83 beats/min, oxygen saturation was 98% and temperature was 36.9 °C. The patient was in no acute distress. Cardiovascular and pulmonary exams revealed no abnormalities. Abdominal exam was soft without other specific signs. Labs were significant for hemoglobin of 6.0 g/dL, elevated troponins and an EKG suggestive of diffuse subendocardial ischemia, attributable to profound intravascular volume loss. A point of care ultrasound revealed a large (~8.5 cm) abdominal aortic aneurysm (AAA) with clot (Figs. 1 and 2). A confirmatory abdominal CT with contrast showed a fusiform infrarenal AAA measuring 8.8 cm (anterior-posterior) x 9.1 cm (transverse) x 11.0 cm (craniocaudal) with anterior thrombus (Fig. 3). Posterior rupture resulting in retroperitoneal stranding/hematoma and aneurysmal dilatation of the common iliac arteries were also noted. The patient was taken to the operating room emergently for endovascular aneurysm repair.

1 In a person suspected of having an abdominal aortic aneurysm, what is the diagnostic test of choice?
a Abdominal X-Ray
b CT with IV contrast
c Magnetic resonance angiography
d Gray-scale and Doppler Ultrasound
e Aortography

Correct answer: (b) CT with IV contrast is the preferred diagnostic test of choice for an AAA. CT can reveal features of rupture. The use of IV contrast helps to identify a patent lumen or a thrombus. If the aneurysm ruptured, contrast-enhanced blood may be seen in the abdomen.

(a) An aneurysm may be visible on x-ray as an area of curvilinear calcification; however, it is not adequate for AAA characterization. (c) MRI can provide excellent details of AAAs, however is not the diagnostic test of choice due to cost, and longer scanning time. (d) Ultrasound is useful for the INITIAL detection and sizing of an AAA. It has a limited ability to identify ruptures and imaging quality can be affected by the patient's body habitus or bowel gas. (e) Aortography is reserved for situations such as renovascular stenosis, juxtarenal or suprarenal AAAs.[1]

2 Surgical repair of an abdominal aortic aneurysm is indicated if which of the following are present?
a Abdominal, back or groin pain
b Smoking history
c Diameter of 3.5 cm
d Growth of 0.5 cm in one year
e Marfan's syndrome

Correct answer: (a) Treatment of AAA depends on the size of the aneurysm and presence or absence of symptoms. AAAs presenting with abdominal, back or buttock pain are urgently repaired due to high risk of rupture or impending rupture.

(b) Smoking is associated with accelerated aneurysm growth rate but is not an indication for surgical repair. Importantly, however,

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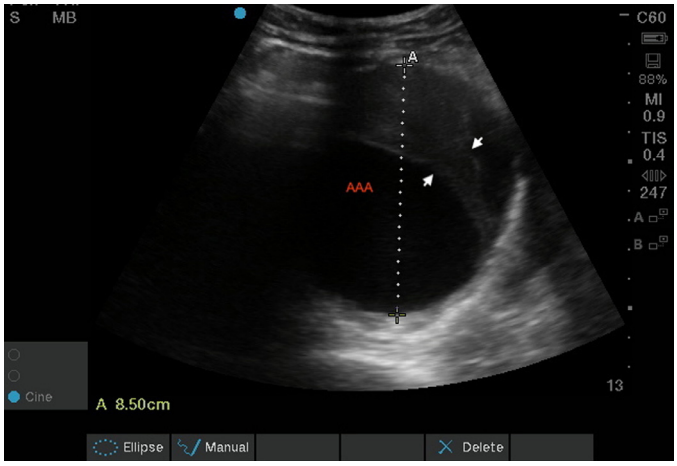

Fig. 1. Transverse sonogram of the abdominal aorta demonstrating an 8.5 cm abdominal aortic aneurysm with an eccentric thrombus (arrows). AAA: abdominal aortic aneurysm.

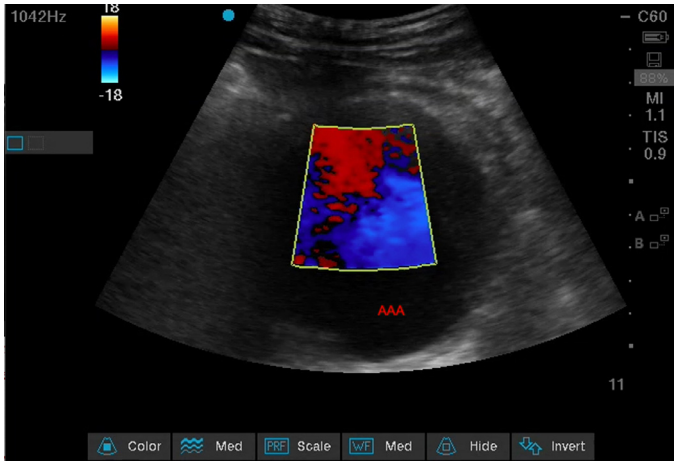

Fig. 2. Transverse sonogram with color Doppler of the abdominal aorta demonstrating abdominal aortic aneurysm. AAA: abdominal aortic aneurysm.

smoking cessation is the most important intervention in medical treatment of AAA. (c) Asymptomatic AAAs less than 5.5 cm are treated by optimizing medical comorbidities and surveillance imaging. AAA's larger than 5.5 cm necessitate surgical repair. (d)

Figure 3. Computed tomographic scan of the abdominal aorta showing an aneurysm with eccentric thrombus in the anterior aspect (arrows). AAA:abdominal aortic aneurysm.

Growth of greater than or equal to 1 cm per year is indication for surgical repair. (e) Marfan's patients are at an increased risk for developing AAA. Marfan's alone is not an indication for surgical repair.[2]

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.visj.2019.100617.

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