



Visual Case Discussion

Low back pain: Point-of-care ultrasound for a rapid diagnosis

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A 68-year-old man, with history of arterial hypertension, presented to Emergency Department (ED) with low back pain for the last ten days. At admission blood pressure was 135/90 mmHg, heart rate was 75 beats/min regular, oxygen saturation was 98%. Cardiovascular examination revealed a normal cardiac rhythm, normal peripheral pulses and no edema. Chest auscultation revealed no abnormalities. Abdomen was tender to palpation without other specific signs. Bedside abdominal ultrasound, with a pocket ultrasound device, revealed a giant abdominal aortic aneurysm (AAA) (Figs. 1–2). The patient underwent abdominal contrast-enhanced CT scan that showed a giant sub-renal aortic aneurysm (16 cm) with evidence of rupture covered by left psoas

and iliopsoas muscles and a partial erosion of vertebral body (Fig. 3). He was immediately transferred to the operating room.

Non-traumatic low back pain can be broadly divided into three categories: benign, self-limited musculoskeletal causes; spinal pathologies that can cause severe neurologic disability because of spinal cord or cauda equina damage; and other abdominal or retroperitoneal processes that can present with back pain.¹

Giant AAA, defined as > 11 cm in transverse diameter, are rare findings.² We report a case of giant AAA with contained-posterior rupture, it represents a rare condition that should be considered in the differential diagnosis of low back pain. In particular, vertebral body



Fig. 1. Point-of-care abdominal ultrasound: a giant abdominal aortic aneurysm. AAA: abdominal aortic aneurysm.

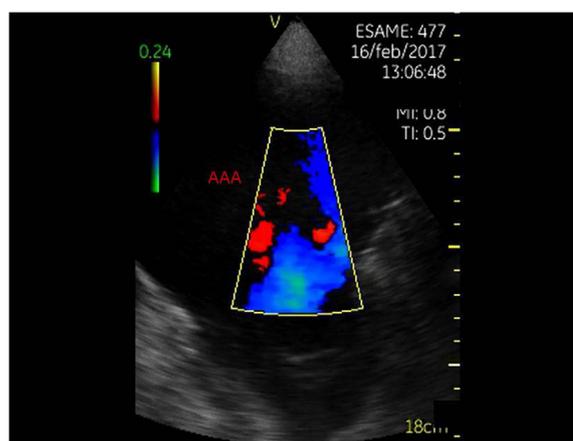


Fig. 2. Point-of-care abdominal ultrasound with color Doppler: a giant abdominal aortic aneurysm. AAA: abdominal aortic aneurysm.

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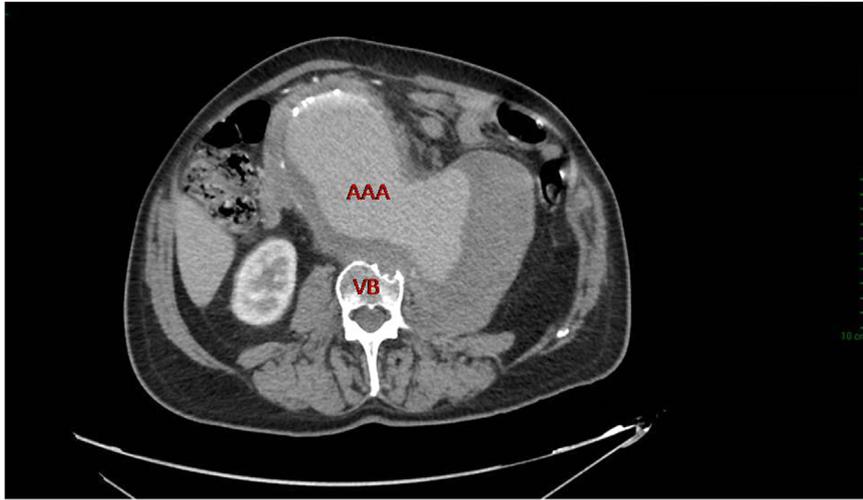


Fig. 3. Abdominal contrast-enhanced CT scan: a giant sub-renal aortic aneurysm with evidence of rupture covered by left psoas and iliopsoas muscles and a partial erosion of vertebral body. AAA: abdominal aortic aneurysm, VB: vertebral body.

erosion is due to the pounding nature of the aneurysm, which results in ischemia of the vertebral bone.

A recent study demonstrated that emergency medicine residents with appropriate training can accurately determine the presence of AAA as well as the maximal aortic diameter.³

Point-of-care ultrasound performed by the emergency physician, with pocket ultrasound device, may be helpful in speed up the diagnostic work-up in low back pain allowing rapid identification of life-threatening conditions such as AAA rupture. Considering patient's hemodynamic stability, our patient underwent CT scan that confirmed the ultrasound diagnosis but in hemodynamic unstable patients with high degree of suspicion for AAA rupture, point-of-care ultrasound represents the only diagnostic tool to speed up patient transfer to the operating room.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.visj.2018.06.002](https://doi.org/10.1016/j.visj.2018.06.002).

References

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Questions

1. Are men more likely than women to have an abdominal aortic aneurysm that is ≥ 4 cm?
 - a. True
 - b. False
2. Is the transverse diameter an important factor related to likelihood of rupture?
 - a. True
 - b. False

Answers

1. True. Abdominal aortic aneurysm is a disease primarily of men with a 4:1 male to female predominance. In particular men are 10 times more likely than women to have an abdominal aortic aneurysm that is ≥ 4 cm (2).
2. True. Aneurysm size is the most important factor related to likelihood of rupture, and the risk increases substantially in large aneurysms. The annual rupture risk for AAAs > 8 cm is 30–50% (2). The annual rupture risk is $< 1.5\%$ for AAAs ≤ 5.4 cm, 5–15% for AAAs between 5.5 and 6.0 cm, 10–20% for AAAs between 6.0 and 6.9 cm, 20–40% for AAAs between 7.0 and 7.9 cm.