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Visual Case Discussion

Low back pain in the emergency department: POCUS (point of care ultrasound) guided the final diagnosis

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A 56 years old man, smoker and with past medical history of arterial hypertension presented to the ED with low back pain for about three days, and interscapular pain in the last few hours. He was alert, oriented and attentive and its vital parameters were normal (Blood Pressure-120/80 mmHg, temperature-36.5 °C, pulse 80 bpm, pulse oximetry 98% room air). Physical examination did not show relevant findings except for mild tenderness in abdominal palpation. Point of care ultrasonography (POCUS) was then performed to evaluate aorta, starting from its abdominal tract, using sector probe. In long axis view a floating intimal flap was evident in the aortic lumen (video clip 1). Patient was immediately referred for CT angiography that showed dissection of the thoracic and abdominal aorta (type b Stanford) starting from descending thoracic aorta to the right common and external iliac artery (Figs 1 and 2). The splanchnic vessels originated from the true lumen, their caliber was regular, and with preserved opacification. The false lumen appeared larger in size than the true lumen. Ascending aorta and aortic arch were regular. Aortic dissection is a challenging diagnosis, with a big variety of clinical pictures that can make the diagnosis really difficult and often delayed, so that a high index of clinical suspicion is necessary.[1] Management of patients with non-traumatic low back pain is challenging and use POCUS can allowed to rapidly identify life treating conditions such as acute aortic syndromes.[2] Gibbons et al. developed an aortic dissection POCUS protocol combining TTE with abdominal ultrasound in a retrospective study involving more than 400 patients with suspect aortic dissection.[3] The protocol evaluate the presence of one of the following sonographic findings: pericardial effusion, intimal flap, or aortic outflow tract diameter measured at end-diastole >3.5 cm.[3] In the abdominal aorta, the presence of an undulating intimal flap suggested aortic dissection. The protocol identified 96.4% of patients with aortic dissections, confirmed on CT.[3]

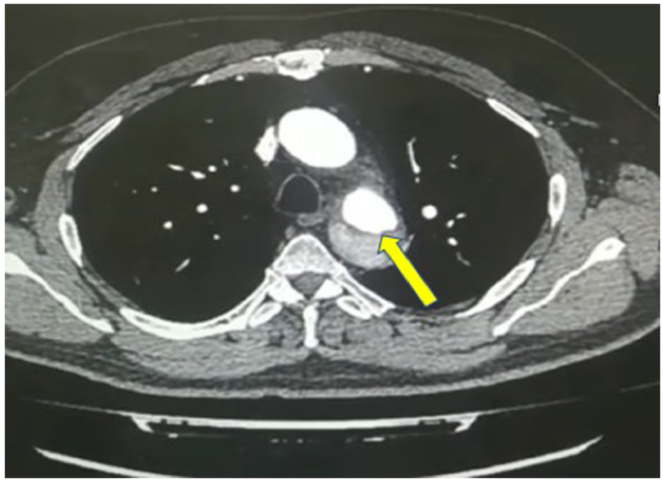

Fig. 1. Transverse computed tomography imaging of the thoracic aorta. A yellow arrow points to the intimal flap that is visible within the aorta.

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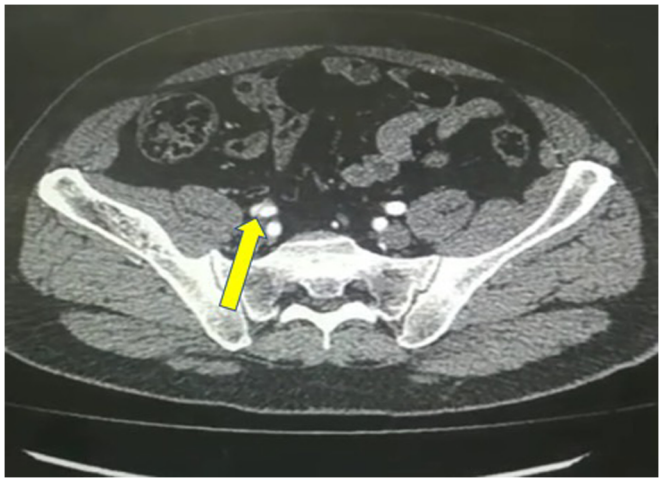

Fig. 2. Transverse computed tomography imaging of the iliac arteries. A yellow arrow points to the intimal flap that is visible within the right external iliac artery.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.visj.2019.100592.

References

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Questions

1. Which of the following symptoms could characterize patients with aortic dissection?
   a. Precordial pain
   b. Interscapular pain
   c. Low back pain
   d. Abdominal pain
   e. All of the above

2. All of the following statements of aortic dissection are true, except:
   a. Type A affects ascending aorta and arch
   b. Type B begins beyond brachiocephalic vessels
   c. D-dimer test can be used to rule out the diagnosis
   d. The most common symptom is pain
   e. The most common cause is Marfan's syndrome

3. What available imaging modality in the ED can be used to prompt evaluate the aorta?
   a. Magnetic resonance imaging (MRI)
   b. X-ray
   c. Computed axial tomography (CAT)
   d. POCUS (point of care ultrasound)
   e. None of the above

Answers

1. All of the above. Explanation: The dissection can be confined or extended distally along the aorta and its main branches and can determinate different clinical pictures: precordial pain, interscapulum pain, low back pain, abdominal pain.

2. The most common cause is Marfan's syndrome. Explanation: Stanford classification of aortic dissection is divided into 2 types: type A affects ascending aorta and arch; type B begins beyond brachiocephalic vessels. D-dimer test can be used to rule out acute aortic dissection in patients with low pre-test probability. Among the main causes of aortic dissection there is hypertension; Marfan syndrome is not the most common cause.

3. POCUS (point of care ultrasound). Explanation: POCUS is the available imaging modality used to evaluate the aorta at the patient's bed to enrich and complete an objective examination in a few minutes.