Aorto-caval fistula complicating an abdominal aortic aneurysm

Clinical History:

A 86 year-old male with history of hypertension and dyslipemia, diagnosed with infrarenal aortic aneurysm, consults for the second time in the last month with a history of lower abdominal pain, irradiated to the back and lower limbs and acute haemoglobin drop of more than 3 grams.

Imaging Findings:

A computed tomography angiography (CTA) of abdominal aorta was made, that showed the known abdominal aortic aneurysm, of 7.2 x 10.4 x 8.2 cm, which increased in size from the previous CT performed one month before, with a 3 cm thick intramural thrombus.

The study also manifested a fistulous tract between the aneurysm and the inferior vena cava (image 3), with retrograde dilatation of the renal veins. The inferior vena cava (IVC) and the hepatic veins showed similar density to the aorta in the arterial phase and there was a significant dilatation of the hepatic veins, the IVC and the right heart chambers, suggesting right cavities overload secondary to the left to right shunt.

An extensive retroperitoneal haematoma in the left psoas compartment and in the anterior and posterior left pararenal spaces was observed, consistent with acute aneurysm rupture (image 3).

Patient underwent endovascular stent-graft repair, with a good outcome.

Discussion:

Spontaneous aorto caval fistula (ACF) is a rare entity, first described by Sime in 1831. The most frequent cause of a spontaneous ACF is an atherosclerotic infrarenal aneurysm, although it has rarely been found in association with syphilitic and mycotic aneurysm and in other aneurysm forming conditions such as Marfan’s syndrome, Ehlers-Danlos syndrome and Takayasu arteritis [1-3].

The classical triad of abdominal pain, pulsatile abdominal mass and abdominal machinery-like bruit may be absent in up to 50% of patients [2], making preoperative diagnosis difficult.

The gold standard for detecting and characterizing an ACF today is computed tomographic angiography (CTA) [4]. Typical findings are: early contrast enhancement of the inferior vena cava (earlier than renal and hepatic parenchyma), which has the same density of the adjacent aorta, retrograde enhancement of dilated renal or iliac veins, an associated aortic aneurysm, loss of normal anatomic space between the aorta and the inferior vena cava.
The fistulous tract between AAA and IVC may be rarely detected [5]. MR angiography (MRA) offers an important alternative particularly in patients with renal failure, or other contraindications to iodinated contrast material. (4). The speed, high spacial and contrast resolution, as well as lack of nephrotoxicity makes breath hold-gadolinium-enhanced 3D MRA a well suited, noninvasive and fast modality for diagnosis of ACF, and is preferred compared to time-of-flight and phase-contrast techniques [2]. Contrast-enhanced ultrasound (CEUS) is a good alternative to MRA or CTA, particularly when the patient is unstable. Some limitations are that the equipment needed is highly specific and not widely available, the examination is operator dependent and it cannot cover all aspects of the aorta, thus it may underestimate the true extent of the aortic aneurysm [4].

ACF is a life threatening condition that leads to high-output cardiac failure and death without surgical repair. A quick diagnosis is crucial. Mortality rates after repair of an ACF range from 20% to 55%, with two thirds reduction if the diagnosis is known preoperatively [4]. Conventional surgical repair was the only treatment. Nowadays, endovascular stent-graft repair offers an attractive therapeutic alternative, although further research and experience are necessary with this technique regarding long term outcome and technical aspects [6].

**Differential Diagnosis List:** Conventional catheter angiography confirmed the presence of an aorto-caval fistula.

**Final Diagnosis:** Conventional catheter angiography confirmed the presence of an aorto-caval fistula.

**References:**


**Figure 1**

**Description:** CTA shows the aortic aneurysm with a thick mural thrombus. The fat plane between the aorta and the IVC has been lost (white arrow). Note a thin enhancing tract within the thrombus (red arrow).

**Origin:** Radiology Department, Morales Meseguer Hospital, Murcia, Spain
Description: Abdominal aorta CTA performed in June 2014 shows that the inferior vena cava (blue arrow) and the abdominal aorta (red arrow) have the same density on arterial phase, finding highly suggestive of arteriovenous fistula. Origin: Radiology Department, Morales Meseguer Hospital, Murcia, Spain
Figure 3

Description: Images shows the lost of the fat plane (white arrow) and the fistulous tract (red arrow) between the abdominal aortic aneurysm (AAA) and the inferior vena cava (IVC) (blue arrow). Note the retroperitoneal haematoma (stars). Origin: Radiology Department, Morales Meseguer Hospital, Murcia, Spain
**Description:** Axial plane images of CTA at the level of the chest reveal the dilation of right cardiac chambers (stars) in June compared to previous scanner, corresponding to right chambers overload.

**Origin:** Radiology Department, Morales Meseguer Hospital, Murcia, Spain