

## Aortocaval fistula

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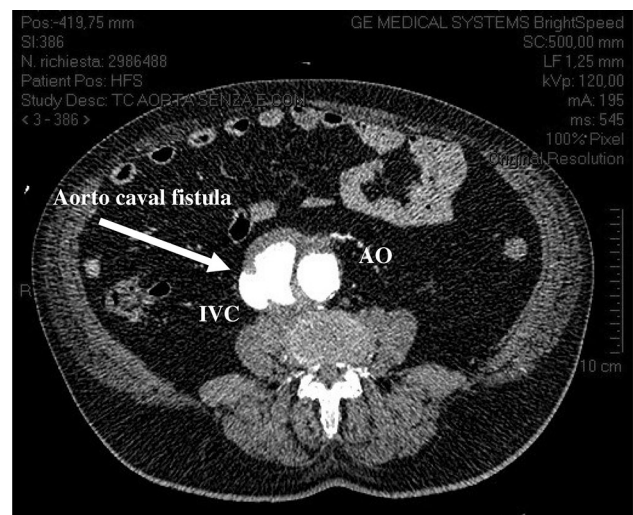
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A 71-year-old man with a history of diabetes and coronary artery disease, was admitted to the emergency department (ED) with a 4-h history of left-sided abdominal, leg and scrotal pain. He was taking insulin and antiplatelet therapy. Upon arrival at the ED, the patient was responsive, hemodynamically stable, and complaining of abdominal pain. The vital signs were: heart rate 130 beats/min, right arm blood pressure 120/75 mmHg, temperature 37 °C and respiratory rate 26 breaths/min. Percutaneous oxygen saturation was 98 % on room air. The lung sounds were clear and symmetrical with no wheezes or crackles; the heart beats were regular without murmurs: the femoral pulses were reduced on the left side, and the extremities were moist and cold with hypoperfusion.

A bedside ultrasound study performed by the emergency physician showed an infrarenal abdominal aortic aneurysm (AAA 6.9 × 6.2 cm) with an aortocaval fistula (ACF), as evidenced by a jet effect of aortic blood flow into the inferior vena cava (IVC). An urgent surgery intervention was mandatory. Promptly, an abdominal preoperative computed tomography (CT scan) with contrast-enhanced arterial phase was performed as requested by the surgeon, and it confirmed the presence of the infrarenal abdominal aortic aneurysm (7 cm × 9 cm of length). During the

arterial phase, there was a rapid contrast filling of the inferior vena cava and iliac veins, indicating the presence of a large ACF confirming our hypothesis (Fig. 1). A subsequent three-dimensional CT scan reconstruction in coronary projection has identified a fistula between the aorta and the inferior vena cava just a few centimeters above the iliac vein (Fig. 2).

Due to the considerable size of the ACF and the potentially unstable clinical situation, the patient was taken

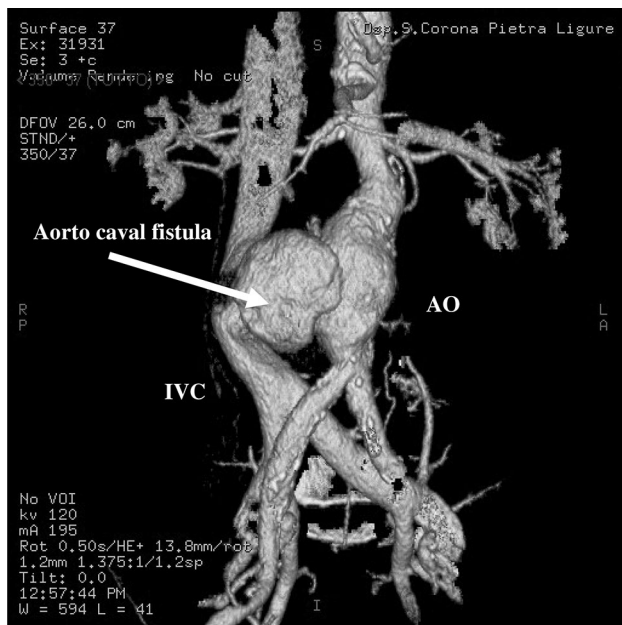


**Fig. 1** CT scan: three of the four typical CT findings of ACF on CT are present in this slice. Early contrast enhancement of the inferior vena cava, which has the same density of the adjacent aorta, an associated aortic aneurysm, and loss of normal anatomic space between aorta and inferior vena cava (arrow). Contrast computed tomography simultaneously showed an abdominal infrarenal aortic aneurysm (7 × 9 cm) with communication between the aorta (AO) and the inferior vena cava (IVC). On the right you can see the true and the false lumen of the aortic aneurysm, and on the left the aortocaval fistula (arrow)

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**Fig. 2** Three-dimensional CT scan: coronary projection allowed the clear visualization of the aortocaval fistula just a few centimeter above the iliac vein and artery (arrow). On the right you can see the aortic aneurysm, and on the left the inferior vena cava, between them the aortocaval fistula

to an emergency operation. The operation was performed with a transperitoneal approach through a midline incision. The aneurysm had the morphological characteristics of an inflammatory aneurysm with perianeurysmal fibrosis.

Fifteen days later, the patient was discharged from the Intensive Care Unit (ICU) and he was transferred to a rehabilitation unit.

Aortocaval fistula is a rare entity, complicating about 0.2–0.04 % of all abdominal aortic aneurysms [1, 2]. Rare causes include mycotic aneurysm, lues, and disorders of connective tissue, such as the Ehlers–Danlos and Marfan

syndromes [3]. Clinical symptoms are nonspecific; a small aortocaval fistula may be asymptomatic. Classic clinical signs of an ACF are: pain in the abdomen, palpable aneurysm, and abdominal bruit, though the specific “triad” is not always present. Before wide implementation of spiral and multislice computed tomography (CT scan), some studies reported about 75 % of preoperatively undiagnosed cases of ACF.

Typical findings of an ACF on the CT scan are as follows: 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 (Fig. 1).

The prognosis of this condition is closely dependent on how early it is diagnosed, and particularly if this is done before operation. Diagnosis before surgery is desirable as it allows preparation by the surgeon for appropriate operative techniques. In one series mortality is 15 % if diagnosis was made before surgery in contrast with 100 % mortality if it is not [4].

**Conflict of interest** None.

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