Case 3724

The role of color Doppler USG in the diagnosis of abdominal aortic aneurysm

Published on 11.04.2006

DOI: 10.1594/EURORAD/CASE.3724
ISSN: 1563-4086
Section: Cardiovascular
Case Type: Clinical Cases
Authors: Basha M
Patient: 65 years, male

Clinical History:

The patient is a pensionist without any job. Cardinal symptoms: pain in the abdominal region, loss of appetite, nervousness and shortness of breath.

Imaging Findings:

The patient is a pensionist without any job. Cardinal symptoms: pain in the abdominal region, loss of appetite, nervousness and shortness of breath. During color Doppler ultrasound examination the abdominal aorta near the umbilicus was dilated. The size was more than 40 mm in transverse section. In longitudinal section the abdominal aorta was as a segment 71.6 mm long and 43.8 mm width. A hyperechogenic thrombotic deposit was seen with size of 16.3 mm. Inside the lumen was present the irregularity of color Doppler spectrum. After that the CT scan with injection bolus contrast was performed and the diagnosis of Abdominal Aortic Aneurysm was confirmed. CT scan also confirmed the dilated of iliac arterie.

Discussion:

Given the high rate of morbidity and mortality associated with abdominal aortic aneurysms (AAAs), accurate diagnosis and preoperative evaluation are essential for improved patient outcomes. Generally, one should assume that an aneurysm is present when the external aortic diameter is greater than 4 cm. Ultrasonography is the standard method of screening and monitoring AAAs that have not ruptured. In the past, aortography was commonly used for preoperative planning in the repair of AAAs. More recently, computed tomography (CT) has largely replaced older, more invasive methods. Recent advances in CT imaging technology, such as helical CT and CT angiography, offer significant advantages over traditional CT. Intraluminal thrombotic deposits, especially in conjunction with calcific degeneration of the intima, are further indication. Such deposits is visible even on plain scans, and they appear as hypodense zones. Sclerosis of the dilated aortic wall or of the thrombotic deposits is a frequent finding. Use of endovascular stent grafts has increased recently and is less invasive for the repair of AAAs in selected cases. Aortography and CT angiography can precisely determine the size and surrounding anatomy of the AAA to identify appropriate candidates for the use of endovascular stent grafts. Aneurysms of the aorta may be saccular or fusiform and are recognized as localized or circumferential areas of aortic enlargement, often with thin walls. AAA are a relatively common finding in the elderly population. In patient with marked arteriosclerotic disease, prevalence may range between 6% and 20%. Arteriosclerosis is the most common cause of AAA. Other etiologies such as cystic media, necrosis, myotic origin or aortic dissection are much less frequent. Traumatic aneurysms are rare and usually due to direct trauma (shot gun or stab wounds). Most aneurysms are fusiform. Therapy is initiated if the size of an aneurism exceeds 4-5 cm. Saccular aneurysms often are myotic etiology and tend to grow faster. In the case of saccular aneurysms surgery may be indicated earlier and is thus determined on an individual basis. Classification of AAA: Aneurysms are classified according to their spatial relationship to the renal arteries (suprarenal, perirenal...
and infrarenal) since this determines whether an interventional radiological treatment is possible or a surgical approach is necessary. With involvement of renal or visceral arteries or with too short a distance of the AAA from the renal arteries a surgical treatment with re-implantation of the arteries in the graft becomes necessary. The involvement of the iliac arteries determines whether a straight or y-shaped graft will be implanted and whether a radiological intervention is feasible: in general at least one internal iliac artery has to be preserved to ensure sufficient perfusion of the pelvic organs. For the purpose of radiological stent grafting various classification schemes have been suggested.

**Differential Diagnosis List:** Abdominal Aortic Aneurysm

**Final Diagnosis:** Abdominal Aortic Aneurysm

**References:**

Silverstein MD, Pitts SR, Chaikof EL, Ballard DJ. Related Articles, Links
Abdominal aortic aneurysm (AAA): cost-effectiveness of screening, surveillance of intermediate-sized AAA, and management of symptomatic AAA.

Costantino TG, Bruno EC, Handly N, Dean AJ.
Community-based screening for abdominal aortic aneurysm. Related Articles, Books, LinkOut

[No authors listed]
Figure 1

Description: B-mode USG of AAA, transverse view.
The external aortic diameter is greater than 4 cm. Origin:
Description: USG color Doppler of AAA with spectrum. Note the irregularity of the spectrum inside the dilated lumen of the aorta with thrombotic deposits.

Origin:
Description: USG Longitudinal view of AAA.
The external aortic diameter is greater than 4 cm. Sclerosis of the dilated aortic wall and thrombotic deposits are also seen. Origin:
Figure 4

Description: USG color Doppler transverse view of AAA. Note the red colour inside free lumen and posterior hyperechogenic sclerosis wall. Origin:
**Description:** USG color Doppler transverse view of AAA

Note the blue and red colour inside the lumen. It is also present the intraluminal thrombotic deposits of the posterior wall. **Origin:**
Description: CT scan of AAA.
After a bolus injection of contrast medium, the lumen can always been seen on axial CT scans. There is spherical enlargement of the aortic lumen with wide, ringlike calcification. Origin:
Figure 7

**Description:** CT scan of AAA with thrombus.

The hyperdense zone is the free lumen and the hypodense zone is the thrombus.
It is also present the calcification of the lumen wall. **Origin:**
Description: USG color Doppler of AAA with hyperechogenic thrombus on the posterior wall. The thrombus size is 16.3mm. Origin:
Description: CT scan with contrast of AAA.
Note also the dilatation of the arteria iliaca dexter. Origin: