

# Hepatic artery aneurysm: Imaging findings

Hepatik arter anevrizması: görüntüleme bulguları

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Hepatic artery aneurysm is uncommon with an estimated incidence of less than 0.25%. Because most patients are asymptomatic, the diagnosis is usually made as an incidental finding on imaging studies performed for other reasons. Because of their propensity to rupture with potential catastrophic intraperitoneal hemorrhage, early diagnosis is important. Herein, relatively asymptomatic two aneurysms of the hepatic artery of atherosclerotic etiology is presented. The importance of imaging findings in the diagnosis of this condition is discussed and relevant literature is reviewed.

Key words: **Hepatic artery aneurysm, computed tomography, angiography**

Hepatik arter anevrizmaları ender olup, insidansı % 0.25'den daha azdır. Hastaların çoğu asemptomatik olduğu için tanı genellikle başka nedenlerle yapılan görüntüleme tetkikleri sırasında tesadüfen konulur. Hepatik arter anevrizmaları, potansiyel katastrofik intraperitoneal kanamayla rüptüre olmaya eğilimli oldukları için erken tanı önemlidir.

Burada, etyolojisinde aterosklerozun rol oynadığı iki adet HAA'sı bulunan bir olgu sunulmaktadır. Tanıda görüntüleme bulgularının önemi tartışılmış ve ilgili literatür gözden geçirilmiştir.

Anahtar kelimeler: **Hepatik arter anevrizması, bilgisayarlı tomografi, anjiyografi**

The hepatic artery is the fourth common site of intraabdominal aneurysm from any cause following infrarenal aorta, iliac artery and splenic artery (1,2). Hepatic artery aneurysm (HAA) represent approximately 20% of all visceral aneurysms (3). 80% HAAs are extrahepatic and 20% are intrahepatic. 63% of HAAs involve the common hepatic artery, 28% involve the right hepatic artery, 5% involve the left hepatic artery, and 4% both the left and right hepatic arteries (1,2).

## Case report

A 53 year-old female patient presented with 6-month history of right upper abdominal pain. The physical examination was unremarkable. Routine hematological and biochemical profiles were normal.

Gray scale abdominal ultrasonography revealed two well-defined, rounded cystic masses measuring 20 mm and 10 mm in diameter in the region of the porta hepatis.

Doppler sonography, performed to evaluate the vascularity associated with the lesions revealed pulsatile flow within the lesions with a vascular origin. The findings suggested HAA and helical computed tomography (CT) was subsequently performed. Unenhanced CT scan showed two well-circumscribed lesions at the porta hepatis (Figure 1a, 1b). After intravenous administration of 100 ml. of bolus of contrast medium and scanning in early arterial phase (15-

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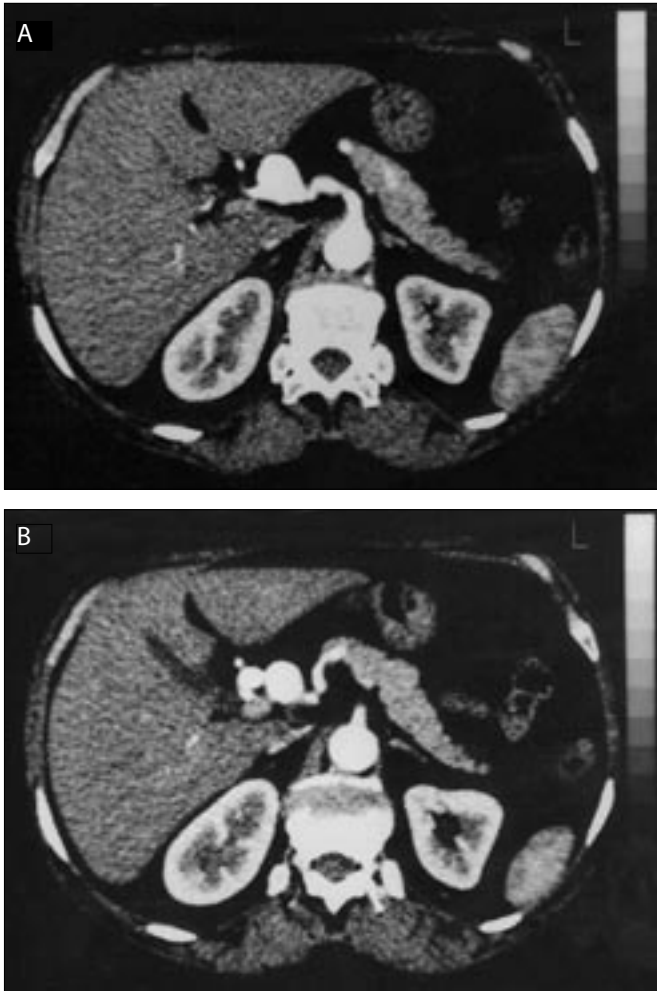
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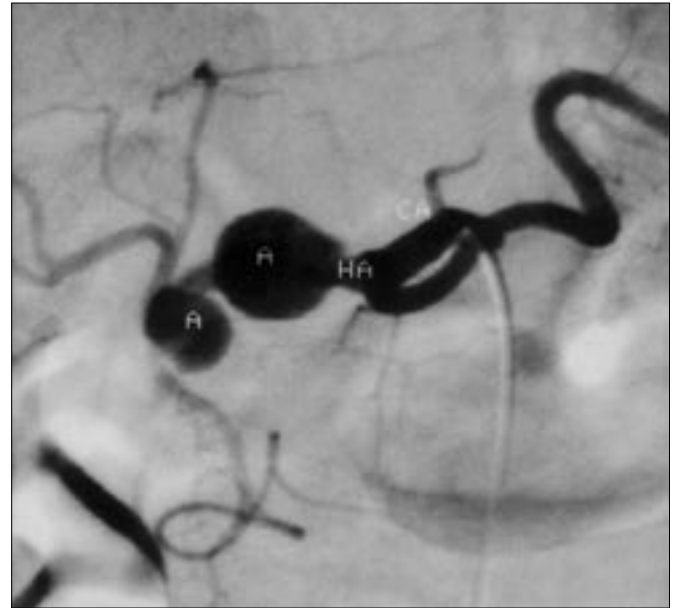
**Figure 1 a,b.** CT scan at the level of the porta hepatis demonstrates two aneurysms of the common hepatic artery

40 seconds) marked enhancement of the lumen of the lesions was noted along the course of the hepatic artery from its origin from the coeliac artery. The diagnosis was confirmed by angiography. An angiogram of the coeliac artery showed two hepatic arterial aneurysms, the one aneurysm was situated at the common hepatic artery and the other one was situated at the bifurcation of the gastroduodenal and proper hepatic artery (Figure 2).

The patient underwent surgical correction of the aneurysms. Histopathology of the specimen was suggestive of atheromatous affection. At follow-up 6 months later the patient was asymptomatic.

### Discussion

There are various etiologies for HAAs. Mycotic aneurysms historically accounted for most HAAs but accounted for only 4% in a recent review (3). HAAs are most frequently caused by atherosclerosis, which is present in as many as 30% of affected patients, and by medial degenera-



**Figure 2.** Selective coeliac axis arteriogram showing two saccular aneurysms of the common hepatic artery (CA: coeliac axis, HA: common hepatic artery, A:aneurysm)

tion, which is present in 24% (1,4). Less common causes are polyarteritis nodosa, tuberculosis, periarterial inflammation (caused by cholecystitis or pancreatitis), fibromuscular dysplasia, trauma, surgery (orthotopic liver transplantation or hepatic tumor embolization) and diagnostic instrumentation (1-4).

HAAs is not initially diagnosed in many cases because the majority of patients with HAAs are asymptomatic prior to rupture (3). In 80 % of the cases rupture of the aneurysms is the first clinical manifestation (5,6). The aneurysms can rupture with equal frequency into the biliary tree or abdominal cavity (3). Of the patients who present with clinical symptoms, abdominal pain is found in 55% and gastrointestinal haemorrhage occurred in up to 46% of symptomatic patients (4). The classic triad of epigastric pain, haemobilia and obstructive jaundice is only present in up to 33% of cases (1-4).

Physical examination is usually normal, although large aneurysms may be associated with a pulsatile mass or an abdominal bruit (1,2,7).

Combining the appropriate imaging techniques makes the definitive of HAAs.

Plain film of the abdomen may occasionally show a curvilinear calcification represently the wall of aneurysm in the right upper quadrant of the abdomen (4,8-10). Contrast studies of the upper gastrointestinal tract may show a deformity of the duodenal curve from external compression (4,8,9).

Endoscopic retrograde cholangiopancreatography or percutaneous transhepatic cholangiography may show biliary dilatation and filling defects, especially in patients with melena (4,8,9).

Ultrasound is an excellent noninvasive method in the evaluation of the liver and porta hepatis for the presence of these lesions. The aneurysm can appear as a mixed echogenic mass with varying proportions of cystic and solid components, depending on the extent of thrombosis. Calcifications can occasionally be seen in the wall (11-13). Doppler ultrasound can aid in differentiating vascular from other types of masses. Color Doppler shows arterial or turbulent flow in the lesion suggestive of it being a mass of vascular origin (1-3). Furthermore, color Doppler ultrasound can differentiate aneurysms from other vascular abnormalities, such as arteriovenous fistulas or malformations. Doppler sonography plays a significant role in the follow-up patients who undergo embolization, allowing unnecessary follow-up angiography to be avoided (1-3,14).

Abdominal CT is often requested in trauma patients. Vessel wall calcification on unenhanced scans usually indicates arteriosclerotic change. Thrombotic deposits in the vessel lumen can be seen as ring-shaped or semilunar internal areas of hypodensity. Images after intravenous contrast medium clearly demonstrate the vessel lumen. An attenuation of 70 HU in the tissues surrounding the aneurysm is a sign of the fresh hemorrhage. While conventional CT can demonstrate an aneurysm, the artery of origin is not always clear. Three dimensional spiral CT may allow a definitive diagnosis to be made prior to angiography in some cases (4,14-17).

Appropriate management of HAA requires detailed angiography. This can confirm the diagnosis, identify any other aneurysms (%20 are multiple), delineate feeding vessel, demonstrate any arterioportal fistula and provide the anatomical information needed for surgery or embolization (1,3,5,17).

Treatment of HAAs is usually in the form of ligation and surgical correction for the extrahepatic aneurysms and transcatheter embolization for the intrahepatic ones (2,4,18).

In conclusion, hepatic artery aneurysms are uncommon lesions that have varied clinical presentations. Early diagnosis is essential because the natural tendency of the lesion is to rupture into peritoneal cavity or surrounding organs. Our case is notable, because two atherosclerotic aneurysms of the hepatic artery are extremely rare with very few cases reported so far and to diagnose a hepatic artery aneurysm before rupture is also unusual.

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