

THE IMPORTANCE OF USUAL IMAGING TECHNIQUES IN ABDOMINAL AORTIC ANEURYSM EXPLORATION – CASE REPORT

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THE IMPORTANCE OF USUAL IMAGING TECHNIQUES IN ABDOMINAL AORTIC ANEURYSM EXPLORATION – CASE REPORT (Abstract): We are reporting on a case of a 61-year-old man with multiple cardiovascular risk factors and with a history of acute myocardial infarction. Following the clinical discovery of a systolic murmur in the mesogastric area corresponding to abdominal aorta, an ultrasonographic examination was performed, finding a thrombosed abdominal aortic aneurysm, near the aortic bifurcation and increased liver size with multiple hypoechogenic masses. In order to confirm the diagnosis a computed tomography was performed revealing a fusiform abdominal aortic aneurysm below the renal arteries, extending to the aortic bifurcation, with a large thrombus attached to the interior wall. The computed tomography scan also revealed a liver tumor. We are underlining the importance of medical history, physical examination and the role of imaging methods in the diagnosis of abdominal aortic aneurysm, in a case with atypical abdominal pain at presentation. The case report includes discussions of essential imaging procedures used in abdominal aortic aneurysm exploration, fast diagnosis being very important to the outcome of this potentially life-threatening condition. Imaging procedures also play a crucial role in the diagnosis of associated pathology, in this case hepatocellular carcinoma. **Key words**: ABDOMINAL AORTIC ANEURYSM, CARDIOVASCULAR RISK FACTORS, IMAGING

INTRODUCTION

Abdominal aortic aneurysm (AAA) is defined as enlargement of the aorta by at least 50% compared to the vessel's normal diameter.

Clinical presentation of AAA may include deep and persistent abdominal pain, back pain and a pulsating sensation in the abdomen. Physical examination can reveal a pulsating mass with tenderness to touch and a systolic murmur described as a “blowing murmur”.

The purpose of this case report is to show the role of physical examination and medical history in raising the suspicion of AAA, as well as to illustrate the contribution of ultrasonography (US) and computed tomography (CT) imaging in confirming the diagnosis.

CASE REPORT

A 61-year-old patient with high blood pressure due to noncompliance in lifestyle intervention, presented to the hospital suffering from lower back pain and atypical abdominal pain over the past two months. The patient had been previously examined by his general practitioner who directed him to a rheumatologist, suspecting a rheumatic pathology of the lumbar spine. Due to persistent symptoms the patient presented to the Cardiology Department of the “St. Spiridon” Emergency Hospital of Iasi for cardiovascular evaluation.

The patient was overweight, he had been smoking 60 cigarettes per day during the last thirty-five years (105 pack-years of smoking)

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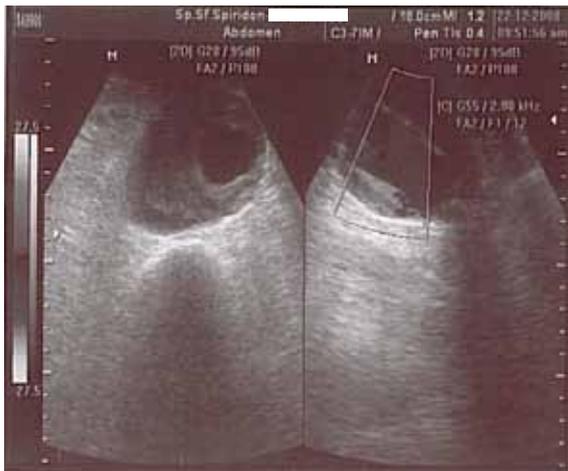


Fig. 1. Transverse view on US of thrombosed infrarenal AAA

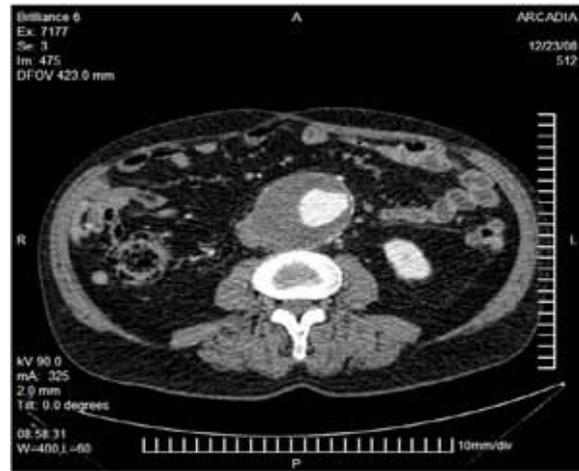


Fig. 2. Axial CT of the abdomen with contrast shows infrarenal AAA with a large circumferential thrombus.



Fig. 3. Axial CT of the abdomen shows a hypodense liver nodule in the right lobe.

and echocardiography revealed important aortic atheromatosis, minimal aortic regurgitation and signs of old myocardial infarction. The radiographic examination revealed prominent aortic arch. US showed a thrombosed AAA with a maximum diameter of 95 mm near the aortic bifurcation and increased liver size with hypoechogenic masses in the right lobe (fig. 1).

A CT scan confirmed the diagnosis, showing a fusiform abdominal aneurysm below the renal arteries, extending to the aortic bifurcation with a length of 115 mm and a diameter of 84 mm. A large thrombus was attached to the anterior wall, with a maximum diameter of 40mm (fig. 2).

Computed tomography of liver masses showed a hypodense nodule of 56 mm with peripheral contrast enhancement in segment VIII and other hypodense nodules in segments IV, V and VIII (fig. 3).

Computed tomography findings of liver masses, infection with hepatitis B virus and the raised high levels of alpha fetoprotein (8536 ng/ml) sustained the diagnosis of hepatocellular carcinoma.

A multidisciplinary team made up of cardiologist, cardiovascular surgeon, gastroenterologist and oncologist assessed the stage of the malignant tumor and the associated comorbidities, concluding that the surgical repair of the AAA had a great risk of mortality with little benefit. The patient was informed regarding the risks and took the final decision. The cause of death was liver failure occurring in the evolution of hepatocellular carcinoma (1).

and he was a heavy drinker. His medical history includes acute myocardial infarction (AMI) 8 years before presentation, complicated by angina pectoris, hypertension, 2nd degree heart failure based on NYHA classification and infection with hepatitis B virus.

The physical examination showed a conscious patient, body mass index 28, with initial vital signs : blood pressure 170/90mmHg, normal cardiac beats, respiration and temperature in normal parameters, a systolic murmur in the mesogastric area corresponding to abdominal aorta and jugular turgescence. Abdominal examination revealed tender hepatomegaly. Pulsating masses were not found with light or deep palpation over the umbilical region and the hypogastric region.

Patient's blood tests have shown hepatic cytolysis, elevated fibrinogen and erythrocyte sedimentation rate. Electrocardiographic examination showed left ventricular hypertrophy

DISCUSSION

Although the etiology of abdominal aortic aneurysm is multifactorial, the most frequent causes are atherosclerosis and hypertension. The role of genetic factors in AAA development, growth and rupture has been proved, family history being a powerful predictor (2).

Risk factors for AAA include: age over 65, male gender, smoking status and pack-years, personal history of atherosclerotic cardiovascular disease, hypertension, height, high values of triglyceride, low-density lipoprotein or total cholesterol. Negative associations of AAA with diabetes mellitus and high-density lipoprotein cholesterol have been found (3).

Two severe conditions having a high risk of mortality, AMI and AAA, were diagnosed eight years apart, in a patient with multiple cardiovascular risks. In high-risk patients screening tests are recommended because the physical exam lacks sensitivity. A single screening abdominal US over the age of 65 can diagnose the majority of AAAs. US screening for AAA in men aged 65 to 75 years who have ever smoked is recommended (4). If the patient has family history, screening should be started at the age of 60, because genetic predisposition is demonstrated, the observed lifetime prevalence of AAA was estimated to be 32% in brothers (1). The reported prevalence of AAA in patients with AMI is 4.7% (5). Important differential diagnosis for AAA is made with rheumatic pathologies of the lumbar spine. In this patient, the pain appeared to have a mechanical etiology, but imagistic evaluation revealed AAA. We emphasize the necessity of differential diagnosis of lower back pain and atypical abdominal pain in a patient with multiple risk factors for AAA.

The imaging methods in acute aortic syndromes have improved significantly and invasive angiography is replaced by noninvasive techniques. US is used for diagnosis and screening. CT is the most commonly used test for confirming the clinical suspicion and Magnetic Resonance Imaging (MRI) has a high degree of accuracy as well (6).

Ultrasonography is an essential diagnostic tool in AAA because of its accessibility and accuracy. For the diagnosis of AAA, US in the emergency department, has been shown to have a sensitivity of 99% and a specificity of 98%, being relatively simple to perform and a time saving procedure (7).

Imaging is fundamental for the screening, diagnosis, monitoring the rate of growth, pre-operative planning and post-operative follow-up of AAA. CT scan in pre-operative planning, allows the precise measurements of the aneurysm, the extension and the presence of the intraluminal thrombus (8).

Computed tomography in patients with suspected AAA rupture is highly accurate, with a sensitivity of 98.3% and a specificity of 94.9% (9).

Association between AAA and gastrointestinal cancer is not common. In pre-operative consultation and evaluation for AAA treatment, an incidental abdominal tumor is diagnosed in 9-13% of cases. Surgical management of patients with AAA and liver malignancy remains controversial. In patients with the two conditions, the most severe or the most symptomatic lesion is treated with priority, but according to literature, there are a few cases of hepatocellular carcinoma coexisting with AAA that were approached in a single-stage procedure. Solving both conditions simultaneously is an appropriate therapeutic choice, having a low risk of graft infection (10,11).

In patients with associated malignancy, endovascular repair of an AAA is reported to be safer and have fewer complications than open surgery. Endovascular repair associates shorter length of stay for patients who received treatment for both AAA and malignancy lower morbidity and mortality rates (12).

CONCLUSIONS

Physical examination and medical history play a fundamental role in raising the suspicion of AAA. To confirm the diagnosis, imaging methods are needed starting with the most simple as US and going to the most complex. US is simple, safe and economical with a sensitivity of 96.3% and a specificity of 100%. It remains the method of choice for AAA screening and surveillance (13). The clinical approach of a patient associating AAA and liver malignancy is personalized and is not uniform in literature. CT scan remains the reference method especially for the specification of anatomical details and complications, as well as associated pathology such as tumor formations as it was in the present case. Estimated life expectancy after cancer resection, clinical status, risk of rupture and experience of the teams are the

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main criteria in choosing the therapeutic strategy (14).

CONFLICT OF INTEREST

This case was presented in terms of ethical issues which were raised by the Romanian Bioethics Journal in the 12th volume from the year

2014. The mentioned article is quoted in the references section. In the present article the approach is totally different from the point of view of the imaging techniques which are useful in the diagnosis of such a pathology. Therefore, we do not consider to be a problem of conflict of interests.

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