

Albert Einstein and Aortic Aneurysm

It is scarcely known that the death of the most outstanding scientist of the XX century, Albert Einstein, father of the revolutionary Theory of Relativity, was due to abdominal aortic aneurysm (AAA) rupture.

At the age of 69, Einstein began with abdominal pain, and by the end of 1948 he was diagnosed with AAA. He was operated on using a pioneering technique at that time: his AAA was wrapped with cellophane. He remained asymptomatic until 1955, when pain returned, and he died from aneurysm rupture on April 18, 1955.

QUESTIONS

- What is an aortic aneurysm? What is its risk?
- What are the risk factors?
- How is aortic aneurysm diagnosed?
- What is the current treatment for aortic aneurysm?

The aorta is the major artery that carries oxygenated blood from the heart to the rest of the body.

The term aortic aneurysm refers to a pathologic dilation of the aortic lumen, involving one or more aortic segments of the arterial wall.

The aortic wall is elastic, expanding and contracting with each heartbeat. Certain conditioning factors can weaken the aorta and cause a localized dilation of the artery; when this is > 1.5 times larger than the normal diameter (≈ 20 mm) it is called aneurysm.

Aneurysms are more common in the abdomen and below the renal arteries (Figure 1) than in the thorax.

The larger the aneurysm becomes, the greater the wall stress is, causing further dilation. The risk of rupture and bleeding is proportional to the aneurysm size, with a high mortality rate; therefore, early diagnosis is vital.

RISK FACTORS

- Smoking (90% of the people with AAA have a history of smoking).
- High blood pressure.
- Hypercholesterolemia.
- Genetic factors.
- Male gender: AAA is 4-5 times more prevalent in men.
- Age: men aged 55 or older, and women aged 70 or older.

ASSESSMENT AND DIAGNOSIS

A palpable, pulsatile abdominal mass on physical examination can be indicative of AAA. The most common imaging studies are abdominal ultrasound and CT scan to diagnose, determine the size and perform annual monitoring of AAA.

TREATMENT

The treatment approach for AAA depends upon its size and location. If the aneurysm is small (between 4 and 5.4 cm) and the patient is asymptomatic, regular follow-up to monitor its size is recommended.

If it grows more than 1 cm a year, or if it is larger than 5.5 cm, surgery is the best therapeutic option.

Current treatment options include:

- a) Open surgical repair (via the abdomen), replacing the dilated segment by a tubular vascular graft of synthetic material.
 - b) Endovascular surgery (intravascular route), advancing an expandable graft along the lower limb arteries to the dilated segment where it is implanted.
- Choosing one or the other depends on the multidisciplinary approach to the case (cardiology, cardiovascular and endovascular surgery) determining risk and feasibility of each procedure.

RECOMMENDATIONS

Abdominal aortic aneurysm is a disease whose complication is a high mortality rate if not treated early.

Early diagnosis is simple and accessible.

Patients with risk factors should be screened for AAA.

Follow-up ultrasound screening is necessary, either alone or together with transthoracic echocardiography, particularly in ≥ 65 -year-old male patients with coexisting risk factors for AAA.

Smoking cessation and high blood pressure control are mandatory.

Current treatments are highly effective, with an acceptable low risk.

Today, thanks to the rapid pace of scientific and technological development, we have modern methods of diagnosis and treatment available, which Albert Einstein did not have almost six decades ago.

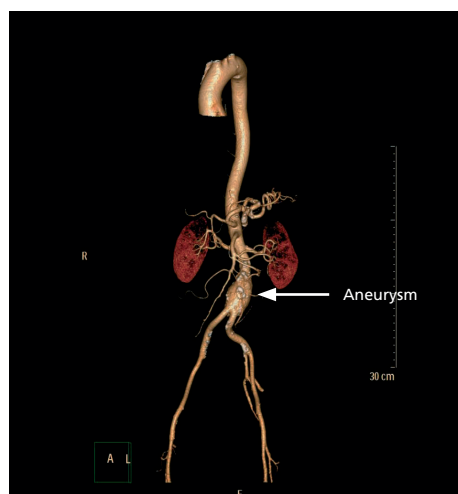


Fig. 1. Abdominal aortic aneurysm.



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INFORMATION YOU MAY FIND IN THE WEB

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