

## CONTINUING MEDICAL EDUCATION ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

### Vascular Diseases Quiz – Case 27

In this CT scan, an abdominal aneurysm and an aneurysm of the left common iliac artery were discovered, the diameters of which were 4.5 cm and 6 cm, respectively (fig. 1). The aortic aneurysm was described to the patient by his personal physician as saccular in shape. To the patient's question, whether this type of aortic aneurysm is more dangerous than the more frequent fusiform aneurysm, the physician replied that it is as dangerous and therefore the patient could wait and have regular checks on its volume and rate of growth. Is the physician's statement true?



Figure 1

#### Comment

*It is common knowledge that the risk of rupture is proportionally related to the aneurysm diameter.*

*Other factors, such as the aneurysm shape, are less studied, but evidence support that saccular aneurysms are more prone to rupture when compared to fusiform aneurysms of the same diameter. Saccular shape and other form irregularities should be considered as important as diameter when it comes to rupture risk prediction, as tunica media elastin is thinner at the neck of the irregularity.*

*It is now debated whether aneurysm diameter or shape can be used as independent rupture predictors and finite element analysis of abdominal aortic aneurysms (AAA) wall stress with three-dimensional CT reconstructions is considered better than diameter or shape for estimating rupture risk (fig. 2).*

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*Debate also exists on how the screening ultrasound scan and measurement should be performed. Aneurysm diameter can be measured using three different methods; outer-to-outer (OTO) edge of the aorta, inner-to-inner (ITI), and a new quite recently reported technique, leading-edge to leading-edge (LTL or LELE), measuring the outer edge of the front wall to the inner edge of the back wall. Differences in measurements vary and could be equal to 4.6 mm*



Figure 2. Finite element analysis of abdominal aortic aneurysm (AAA) wall stress based on 3D computerized tomography (CT) reconstruction. Maximum wall stress at the neck of the shape irregularity (arrow). Wall stress at the maximum diameter is substantially lower (dashed arrow).

in some cases, meaning that patients with an ITI or LTL diameter smaller than 5.5 cm could exceed the 5.5 cm threshold when the aneurysm is measured using the OTO technique, leading the patient to the operation theatre.

Aneurysm maximum diameter is now under scrutiny for being the sole decision making criterion. Medical community needs larger studies on different measuring techniques and how they compare to each other, as well as a totally new approach on the determinants leading to a rupture.

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**Diagnosis:** Large infrarenal saccular aneurysm  
**Answer:** No, saccular aneurysms are considered more prone to rupture than fusiform aneurysms of the same diameter