ASK THE EXPERTS

When and How Do You Survey a Small TAA?

Experts discuss how the definition of small AAAs and TAAs has changed in the past decade and how best to treat them.

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The definition of "small" abdominal, thoracoabdominal, and thoracic aneurysms has changed in the past decade. Traditionally, an abdominal aortic aneurysm (AAA) is considered small if it is < 5 cm, but the ADAM trial and United Kingdom small aneurysm trial have extended this parameter to 5.5 cm. The incidence of thoracic aortic aneurysms (TAAs) and thoracoabdominal aortic aneurysms (TAAAs) is lower than AAAs. Chau and Elefteriades hypothesize that this is due to an increased number of muscle cells per square centimeter in the tunica media compared to other sections. Accordingly, in a natural history study, they demonstrated that the risk of rupture of a TAA is exceedingly rare when it is < 6 cm.[1]

Although AAAs are easily followed through surveillance with ultrasound, it is difficult to use ultrasound to follow TAAAs and TAAs given the bowel gas, ribs, and surrounding structures. Our protocol is to follow patients with TAAAs and TAAs between 4 and 5 cm with MRI or CTA on a yearly basis or sooner if symptoms become a concern. Once the aneurysm reaches 5 cm, we follow TAAs and TAAAs every 6 months with either MRI or CTA and consider repair when they reach 6 cm.

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How to treat and follow patients with small aneurysms is based on limited evidence. Therefore, knowledge of natural history and spontaneous course is crucial. Aneurysmal dilatation is defined as localized dilation to more than 50% compared to the native vessel diameter. In general, the descending thoracic aorta has a diameter of approximately 25 mm. Typically, it is larger in males and increases with age and body surface area. Therefore, a diameter exceeding 35 mm can be considered a TAA.[1] In our opinion, a small aneurysm

has a diameter < 4 cm, whereas a moderate aneurysm has a diameter between 4 and 5 cm. In asymptomatic patients, the size of the aneurysm is still the main determinant of the need for intervention. Data published by the Yale group showed an average expansion rate of the descending thoracic aorta of 0.19 cm per year. Also, the larger the aorta, the faster it grows.

Therefore, during surveillance, a comparison has to be made not only to imaging immediately before intervention, but also to the results of baseline imaging. When following patients, utilization of the same modality at the same institution is reasonable, so that similar images of matching anatomic segments can be compared side by side. CTA has been generally considered the gold standard for measuring aneurysm size. However, in patients with moderate and stable disease, MRI is reasonable instead of CTA to minimize the patient's radiation exposure.[2]

The published hinge point for aortic complications of the descending thoracic aorta is 7 cm. At this aortic diameter, 43% of patients have experienced rupture or dissection. Below 6 cm, the annual rate of any complication (rupture/dissection/death) is < 14%, < 6.5% if the descending thoracic aorta is < 5 cm, and < 5% if the descending thoracic aorta is < 4 cm.[3] In the absence of connective tissue disorders (eg, Marfan syndrome) or rapid growth (> 0.5 cm in 6 months), based on current guidelines, the threshold for elective endovascular stent grafting is 5.5 cm, because the surgical risk of roughly 5% exceeds the risk of aneurysm rupture or dissection below this diameter.[4,5] Eventually, this cutoff might be too liberal for older patients with comorbidities or not conservative enough in others. Therefore, we recommend a surveillance interval of 2 years in asymptomatic patients with a small TAA (< 4 cm). In patients with moderately sized aneurysms (> 4 and < 5 cm) and no evidence of genetic disorders or accelerated growth, this interval still seems reasonable. If the TAA is > 5 cm, annual scanning is indicated. In newly diagnosed patients with a diameter above 5 cm, biannual imaging is advocated in order to estimate the individual growth rate.

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The surveillance of TAAs is hindered by two major issues: (1) a lack of natural history data, with uncertainty about expansion rates and risk of rupture and (2) the need for cross-sectional imaging, which comes with risks associated with repeated irradiation and contrast use for CT, or logistic issues with regard to MRI.

Furthermore, the thoracic aorta may dilate as a primary aneurysmal process or secondary to dissection or other acute aortic pathology. These are likely to have different natural histories, but again, we are limited by a paucity of natural history studies in this area.

A recent analysis of almost 1,000 patients by Patterson et al from our unit at St George's in London gives some guidance with regard to standardizing the surveillance of TAAs.[1] Based on a threshold of 55 mm for intervention, we suggest that most patients with a maximum aortic diameter < 40 mm could safely undergo surveillance at 2-year intervals, either by CT or MRI. If the aortic diameter is > 45 mm, annual surveillance is recommended. Patients with a diameter > 50 mm could be optimized for possible repair, if this is clinically appropriate, although the threshold for intervention remains controversial in the absence of clinical trials or robust clinical outcomes data. Useful information may come from the ongoing Effective Treatments for Thoracic Aortic Aneurysms study being performed in the United Kingdom, a large-scale observational study of patients with thoracic aneurysms.[2] ■

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