The more saccular, the worse?

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There is no consensus regarding surgical indications for small saccular aneurysm of the aortic arch. Empirically, eccentric saccular aneurysms have a higher risk for rupture. There have been many studies demonstrating, using magnetic resonance imaging and computational fluid dynamics, that lower wall shear stress (WSS) and higher oscillatory shear index might accelerate the atherogenic process of the vascular wall. Natsume and colleagues¹ clearly demonstrate that when aneurysm sac depth/neck ratio exceeds 0.8, the WSS is low regardless of the diameter gleaned from clinical images. Further, when the aneurysm depth/neck ratio is <0.8, the WSS inversely correlates with luminal diameter in both saccular and fusiform aneurysms.² They bring new objective criteria to the treatment of saccular aortic aneurysm, making a significant contribution to our field. However, WSS is not the only risk factor for aneurysm enlargement or rupture. Peak wall stress (PWS) has been considered to be a major determinant for aneurysm enlargement by Laplace's law.³ The larger the aneurysm diameter and the thinner the vascular wall, the larger the PWS.

Shang and colleagues⁴ reported that variable wall thickness, intramural thrombus, and calcifications significantly influenced computed PWS of thoracic aneurysms using finite element analysis models. Currently, we do not have clinical diagnostic tools for measuring aortic wall thickness or assessing vascular wall strength. Another concern is that depth/neck ratio >0.8 was observed in only the inner sac, excluding the thrombi. Outer depth/neck ratio of the

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Central Message

We still do not know when to operate on small saccular aneurysm.

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saccular aneurysm was <0.8 in all cases. We routinely follow-up aneurysm patients with plain computed tomography and seldom do contrast-enhanced computed tomography, especially in patients with chronic kidney disease or in elderly patients. It might be difficult to assess the inner sac ratio in practice.

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