

What is your threshold for treating visceral aneurysms versus watchful waiting?



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There is no single, simple answer to the question that has been posed. My decision regarding when to intervene on certain visceral aneurysms depends on a number of different variables. The treating physician, of course, must consider whether the aneurysm can be treated safely and durably using endovascular means versus an open procedure.

Obviously, the location of the aneurysm is important. A 2-cm aneurysm involving the proximal superior mesenteric artery carries considerably less risk than a 2-cm aneurysm involving the gastroduodenal artery or an aneurysm involving a distal extravisceral hepatic branch. Patient age and life expectancy must be considered, as well as the distal outflow and tissue at risk. Also, has the aneurysm remained stable over a long period of time? Does the patient have convincing symptomatology? Does imaging show evidence of distal embolization and infarction? On the other hand, the presence or absence of wall calcification has no bearing on the decision to intervene.

In general terms, I would consider recommending intervention—open or endovascular—for a visceral aneurysm that measures 2 cm or greater with growth observed over time. Certainly, symptomatic patients likely need treatment. I would choose an endoluminal option, coils, or a covered stent, if technically feasible, if predictably durable, and if damage to the distal tissue, if compromised, would not pose a threat to the patient. Aneurysms that are situated intraparenchymally (ie, within the liver, spleen, or pancreas) are ideally treated using endoluminal means when possible. Surgical therapies, preferably aneurysm resection and vascular reconstruction, should be considered for most others.



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My general rule of thumb is 2 cm; however, there are many caveats associated with this. Of course, the overall health status of the patient is primary. The periprocedural mortality rate should be 0.5% to justify elective repair based on an estimated incidence of rupture of about 2%, with a mortality rate of at least 25% when rupture has occurred. The location of the aneurysm is the second consideration. Aneurysms of the superior mesenteric or celiac arteries, for instance, are generally located within the first 5 cm of the artery, and the mortality rate associated with rupture is high.

In addition, the durability of the repair is critical, as intestinal ischemia related to thrombosis is a devastating complication.

In many of these instances, I generally prefer open surgical treatment to assess end-organ perfusion and intestinal viability. This also allows concurrent management of associated conditions such as pancreatic pseudocyst. Open surgical treatment could include simple ligation, aneurysmorrhaphy with preservation of end-organ perfusion, or aneurysmectomy and revascularization via a bypass. Whichever method is chosen, direct visualization of bowel perfusion is very comforting.



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The greatest risk of morbidity and mortality from visceral aneurysms is hemorrhage from rupture of the aneurysm. This can be catastrophic if not treated emergently. Traditionally, surgical management was the standard of care; however, with the introduction of advanced techniques and modernization of catheters, there has been a paradigm shift to endovascular management. Fortunately, the minority of aneurysms present in such a manner. The majority of visceral aneurysms are asymptomatic and are incidentally discovered on imaging studies performed for unrelated symptoms. Although the need for emergent management of ruptured visceral aneurysms is undisputed, there is great controversy over the management of asymptomatic, incidentally discovered visceral aneurysms. The decision to intervene resides in the potential risk of an aneurysm to rupture.

Factors that influence the risk of aneurysm rupture include the size of the aneurysm. However, it is not clear at what size this risk becomes high enough to warrant treatment. It is widely accepted that if the diameter of a visceral aneurysm is > 2 cm or double the diameter of the parent vessel, it should be treated. The physiologic changes that occur during pregnancy make aneurysms more likely to rupture, and

so visceral aneurysms of any size should be treated in women who are of childbearing potential. Aneurysms that are infected or are in close proximity to areas of infection are also at higher risk of rupturing and warrant early intervention, albeit surgical in these circumstances.



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Visceral artery aneurysms are treated based on the etiology, clinical symptoms, imaging characteristics, and associated risk factors for rupture. In general, asymptomatic splenic and renal artery true aneurysms are treated when the aneurysm reaches 2 cm or if the growth of the aneurysm is more than 3 mm over a period of 12 months. However, the same size criterion does not hold true for other visceral artery aneurysms, such as those involving the pancreaticoduodenal arteries or dorsal pancreatic arteries, as the risk of rupture does not correlate with the size.

Similarly, symptomatic or asymptomatic recognition of distal embolization or regional perfusional changes (eg, hypertension secondary to regional ischemia from renal artery aneurysm) requires early treatment of the aneurysm despite a small size. Mycotic, traumatic, and iatrogenic visceral artery aneurysms are treated irrespective of the size of the aneurysm. Imaging characteristics such as presence of intramural hematoma, large thrombus with risk of distal embolization, and focal bulge (pointing) may warrant early therapy despite a small size.

Patient characteristics may also dictate early therapy—visceral artery aneurysms affecting pregnant women or women planning for pregnancy require treatment of the aneurysms despite a small size because the risk of aneurysm rupture and future loss of pregnancy are high. Similarly, aneurysms affecting patients with connective tissue disorders (such as Marfan's and Ehler-Danlos) may benefit from early treatment, as the natural course of visceral artery aneurysms in these patients is not well known. ■