

Embolization for Visceral Artery Aneurysms: What's Your Opinion?

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De Bakey and Cooley did the first successful operation for a visceral artery aneurysm (VAA) in 1953 [1]. They are relatively rare and the risk of rupture is associated with high mortality [2-6]. The majority of patients are asymptomatic prior to rupture and the main indication of elective treatment is size; VAA larger than 2 cm and aneurysms in women of childbearing age is recommended [1-7]. The goal of treatment is to prevent aneurysm expansion by excluding it from the arterial circulation saving branches patency and freedom from rupture or reperfusion [8-10]. Surgery has been considered the treatment of VAA for several decades, but now a days endovascular procedures as embolization or covered stents have increased the treatment options available to comorbid patients not suitable for open repair [7-10].

VAA are seen more often these days with the more widespread use of computed tomography [7-10] (**Figure 1**). Angiography remains the "gold standard" in the preoperative imaging and allows concomitant endovascular interventions, determining proper landing zones in the proximal and distal non aneurysmal segments of the artery for stent-grafts, as well as for determining whether the neck morphology is adequate for coil embolization [11] (**Figure 2**). Embolization of the entire splenic artery at its origin was considered at first, but after thorough deliberation, it was not considered optimal treatment because of the risk of splenic infarction or splenic artery aneurysm recurrence [12].

Coil embolization techniques are often used to "trap" the aneurysm between coils placed proximally and distally within the normal part of the parent artery [11, 13, 14]. This technique is well suited for aneurysms in larger arteries but requires adequate collateral circulation to the end organ. VAA can often be excluded from the circulation in this way by coil embolization of first the distal and then the proximal segment of the parent artery. For smaller arteries, coils or particles placed in distal branches can be used successfully [11, 13, 14]. Contrast-enhanced magnetic resonance angiography (CE-MRA) at 3T provides high-quality images equivalent to digital subtraction angiography (DSA) for the evaluation of VAAs after coil embolization. We suggest that CE-MRA at 3T might be used as the primary method for follow-up of VAAs after coil embolization [15]. Endovascular approach, treatment can be done with different techniques and devices [7-10, 16, 17].

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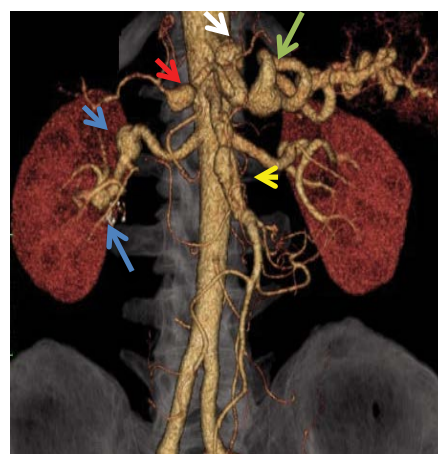


Figure 1 Computed tomography (CT) angiogram of abdominal aorta with multiple visceral artery aneurysms. Celiac artery trunk aneurysm (white arrow); hepatic artery aneurysm (red arrow), splenic artery aneurysm (green arrow), (blue arrows) in the right renal artery aneurysms and (yellow arrow) in the superior mesenteric artery aneurysm.



Figure 2 Splenic artery aneurysm (SAA) from left to right: (blue arrow), digital subtraction angiography image reveal the SAA; (red arrow), after selective catheterization, the aneurysm was treated by coiling which resulted in complete occlusion in the aneurysm sac; visualized in the post-procedure image (black arrow).

It depends on the anatomy localization and morphology of the VAA. Arterial patency can be preserved in saccular aneurysms, in which neck catheterization allows embolization limited to the sac [11, 13, 14, 16, 17] (**Figure 2**). Embolization is successfully used as a treatment option and is another endovascular option for VAA treatment. For successful management without major complications, a sufficient collateral supply is mandatory [7, 9-11,

13, 14, 16, 17]. Modern endovascular techniques with promising short- and long-term results could broaden indications to treat asymptomatic VAA [18]. The promising results of endovascular treatment in elective settings could lead to broader indications, thus reducing life-threatening rupture [18]. However, increased percutaneous endovascular interventions have raised the incidence of iatrogenic visceral artery pseudoaneurysms (VAPAs) [19]. There seems to be no correlation between aneurysm size and associated rupture rate in VAPA. Thus, all VAPAs should undergo prompt repair via either open or endovascular surgery [18]. These catheter-based techniques constitute an excellent approach in the elective setting [19]. Studies could also compare the mid- and long- term results of coiling [19].

The advances with embolization techniques in the last decades are quite evident, and the field of endovascular surgery and minimally invasive techniques has accompanied this development, aiming at overcoming its limitations. However still needs improvement when it comes to long-term evaluation. The technological advances and the development of new devices that may significantly help and provide effective and safe results in the treatment of those patients with VAA.

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