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Mesenteric aneurysms: indications for repair, when open, when endo.

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Disclosures

I was the chair of the SVS VAA clinical practice guidelines writing group
No relevant financial disclosures

SOCIETY FOR VASCULAR SURGERY DOCUMENT

The Society for Vascular Surgery clinical practice guidelines on the management of visceral aneurysms



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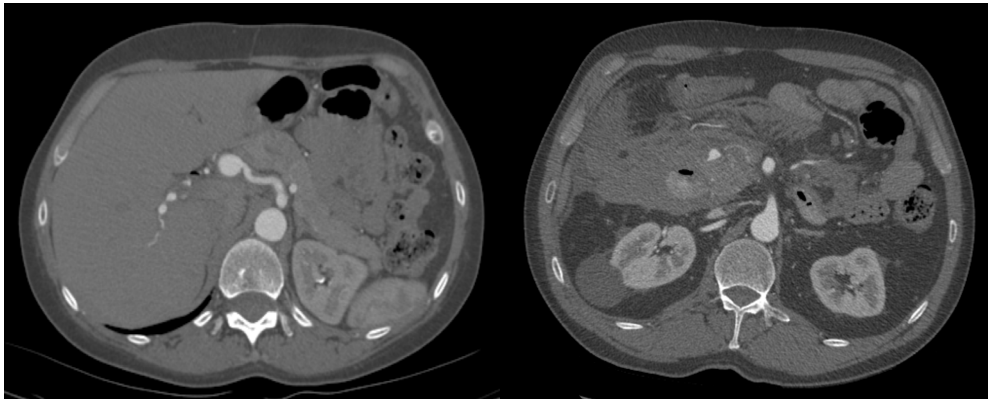
ABSTRACT

These Society for Vascular Surgery Clinical Practice Guidelines describe the care of patients with aneurysms of the visceral arteries. They include evidence-based size thresholds for repair of aneurysms of the renal arteries, splenic artery, celiac artery, and hepatic artery, among others. Specific open surgical and endovascular repair strategies are also discussed. They also describe specific circumstances in which aneurysms may be repaired at smaller sizes than these size thresholds, including in women of childbearing age and false aneurysms. These Guidelines offer important recommendations for the care of patients with aneurysms of the visceral arteries and long-awaited guidance for clinicians who treat these patients. (J Vasc Surg 2020;72:3S-39S.)



Background

Visceral Artery Aneurysms (VAA) rare
Autopsy prevalence of 0.1-2%
Increasingly encountered



Current treatment options

Open

Endovascular

Transcatheter embolization

Coil

Glue

Onyx liquid

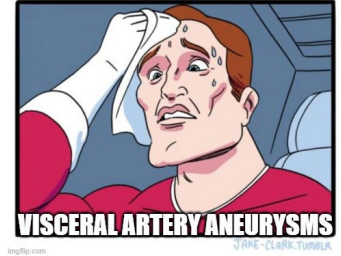
Stent grafts

Percutaneous or open thrombin injection

Endo first if anatomically feasible for many VAAs

Decreased morbidity, allowing for intervention on more complex patients

Decreased length of stay



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New Guidelines



ESVS practice guidelines (2017):

Bjorck M et al. European Journal of Vascular and Endovascular Surgery, Volume 53, Issue 4, April 2017, Pages 460-510

SVS clinical practice guidelines (2020):

Chaer RA et al. The Society for Vascular Surgery clinical practice guidelines on the management of visceral aneurysms J Vasc Surg. 2020 Jul;72(1S):3S-39S.



SVS Clinical Practice Guidelines

GRADE approach

Systematic review of multiple databases

80 observational studies, mostly non-comparative

2845 aneurysms

1279 renal (45%)

775 splenic (27.2%)

359 hepatic (12.6%)

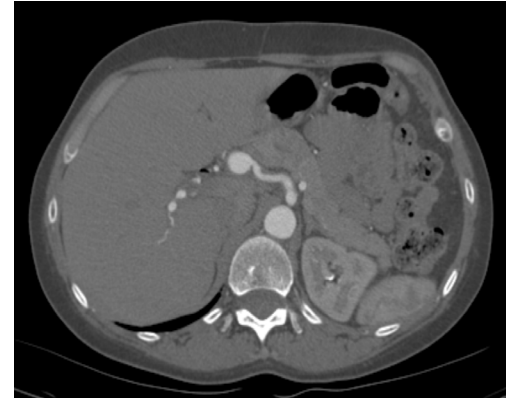
226 PDA/GDA (7.9%)

95 SMA (3.34%)

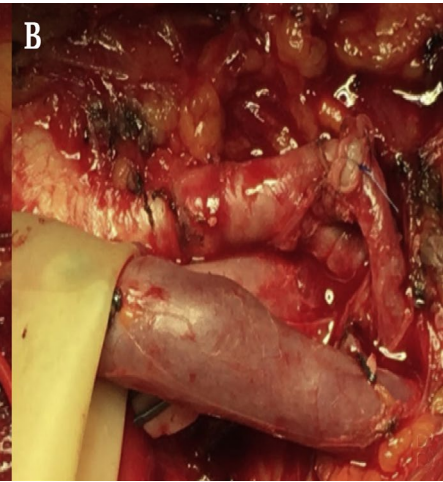
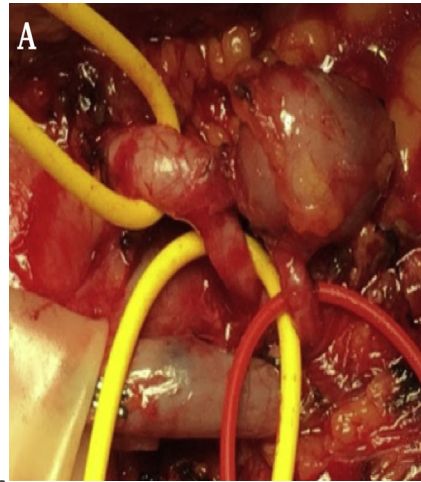
87 celiac (3.06%)

15 jejunal/ileal/colic (0.53%)

9 gastric/gastroepiploic (0.32%)



Renal Artery Aneurysms



Indications

Asymptomatic RAAs **>3cm (2-C)**

Rapid growth

Women in childbearing age (2-B)

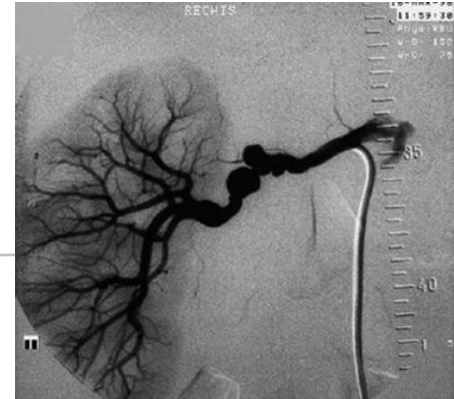
All PSAs

Symptomatic RAAs including refractory HTN (2-C)

Rx:

Open reconstruction for the elective repair of most RAAs in patients with acceptable operative risk. (2-B)

Endovascular techniques for the elective repair of anatomically appropriate RAAs to include stent graft exclusion of main RAAs in patients with poor operative risk and embolization of distal and parenchymal aneurysms. 2 (B).



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Open Repair

3.2: We suggest open surgical reconstructive techniques for the elective repair of most RAAs in patients with acceptable operative risk.

Level of recommendation: Grade 2 (Weak), Quality of Evidence: B (Moderate).

3.3: We suggest ex vivo repair and autotransplantation for complex distal branch aneurysms over nephrectomy when it is technically feasible.

Level of Recommendation: Grade 2 (Weak), Quality of Evidence: B (Moderate).

3.5: We suggest consideration of laparoscopic and robotic techniques as an interventional alternative based on institutional resources and surgeon experience with minimally invasive techniques.

Level of Recommendation: Grade 2 (Weak), Quality of Evidence: C (Low)

Splenic Artery Aneurysms

Most common VAA (40-60%)

Indications

Symptomatic or rupture (1-A)

All PSAs (1-B)

>3cm (1-C)

Significant interval rate of growth (1-C)

All sizes in women of childbearing age (1-B)

Rx

Endo first if feasible w/ coil embolization or stent (2-B)

Open (or laparoscopic) surgery: splenectomy, ligation



SAA. Open Repair

3.5: In treatment of distal SAA adjacent to the hilum of the spleen, we suggest open surgical techniques including possible splenectomy as opposed to endovascular methods, given concern for the possibility of end organ ischemia, including splenic infarction and pancreatitis.

Level of Recommendation: Grade 2 (Weak), Quality of Evidence: C (Low).



Hepatic Artery Aneurysms

Indications

All hepatic artery PSAs should be repaired expeditiously (1-A)

All symptomatic HAAs should be repaired (1-A)

True HAA >2cm (1-A) or >0.5cm/y growth rate (1-B)

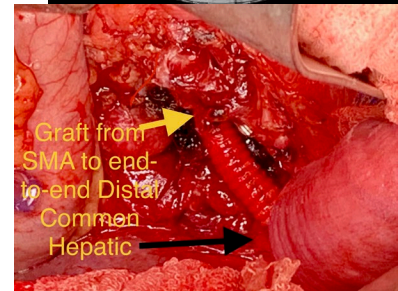
(5cm threshold in patients with severe comorbidities (1-B)

Rx

Endo first (1-A) (open surgery if necessary to maintain liver perfusion (1-A)

Covered stents typically too large for intrahepatic arteries; coil embolization recommended (1-B)

If intrahepatic HAA is large, lobe resection (1-C)



HAA. Open Repair

3.3: In patients with intrahepatic aneurysms, we recommend coil embolization of the affected artery

Level of Recommendation: Grade 1 (Strong), Quality of Evidence: B (Moderate).

In patients with **large** intrahepatic aneurysms, we recommend resection of the involved lobe of liver to avoid significant liver necrosis,

Level of Recommendation: Grade 1 (Strong), Quality of Evidence: C (Low).



Hepatic and gastric aneurysm

64 yo man presenting with GI bleeding

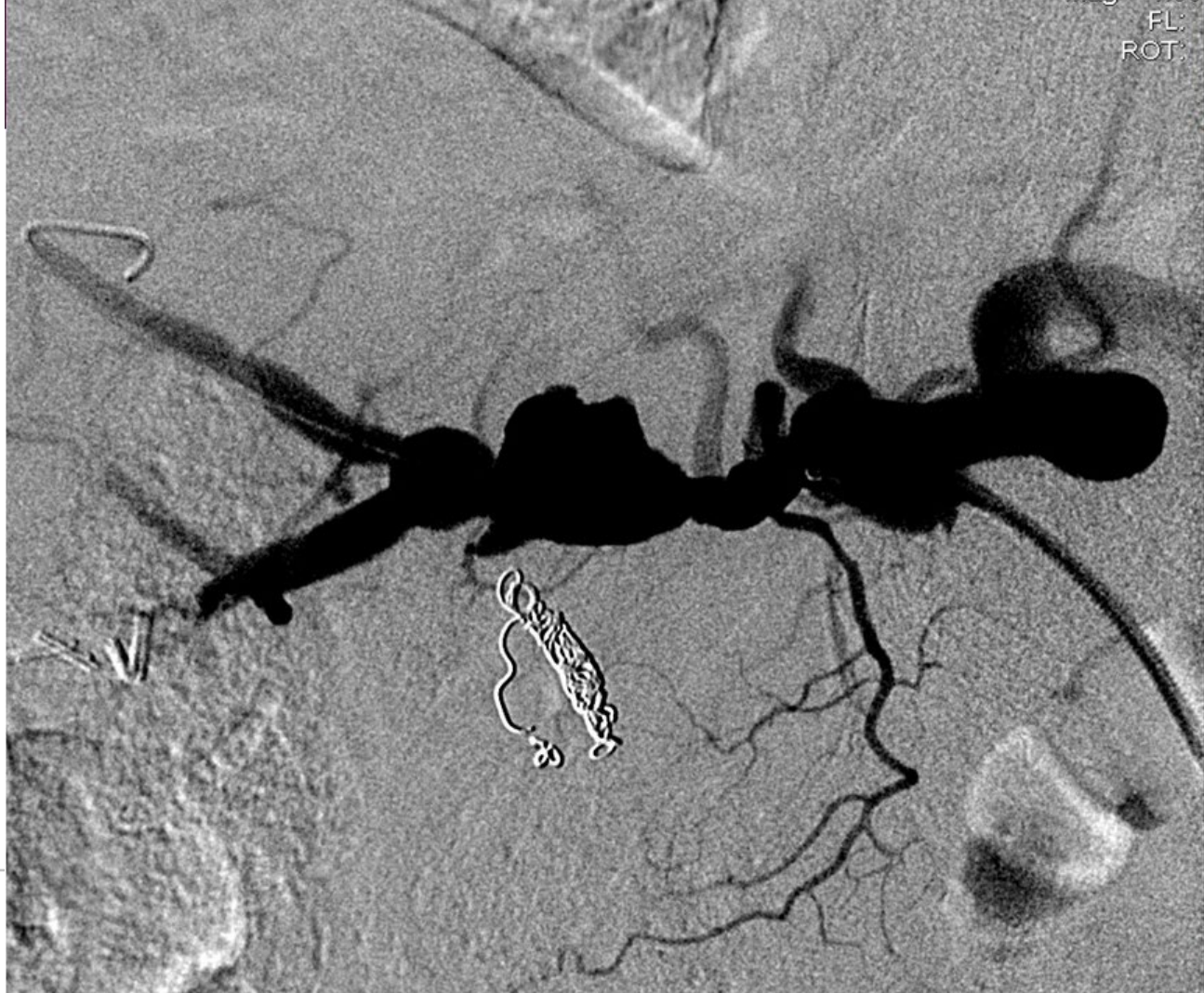
Found to have multiple visceral aneurysms

Underwent coil embolization of GDA aneurysm and transferred to a higher level of care

EGD showed old blood but no clear source for bleeding



FL:
ROT:



left Gastric aneurysm

Hepatic aneurysm

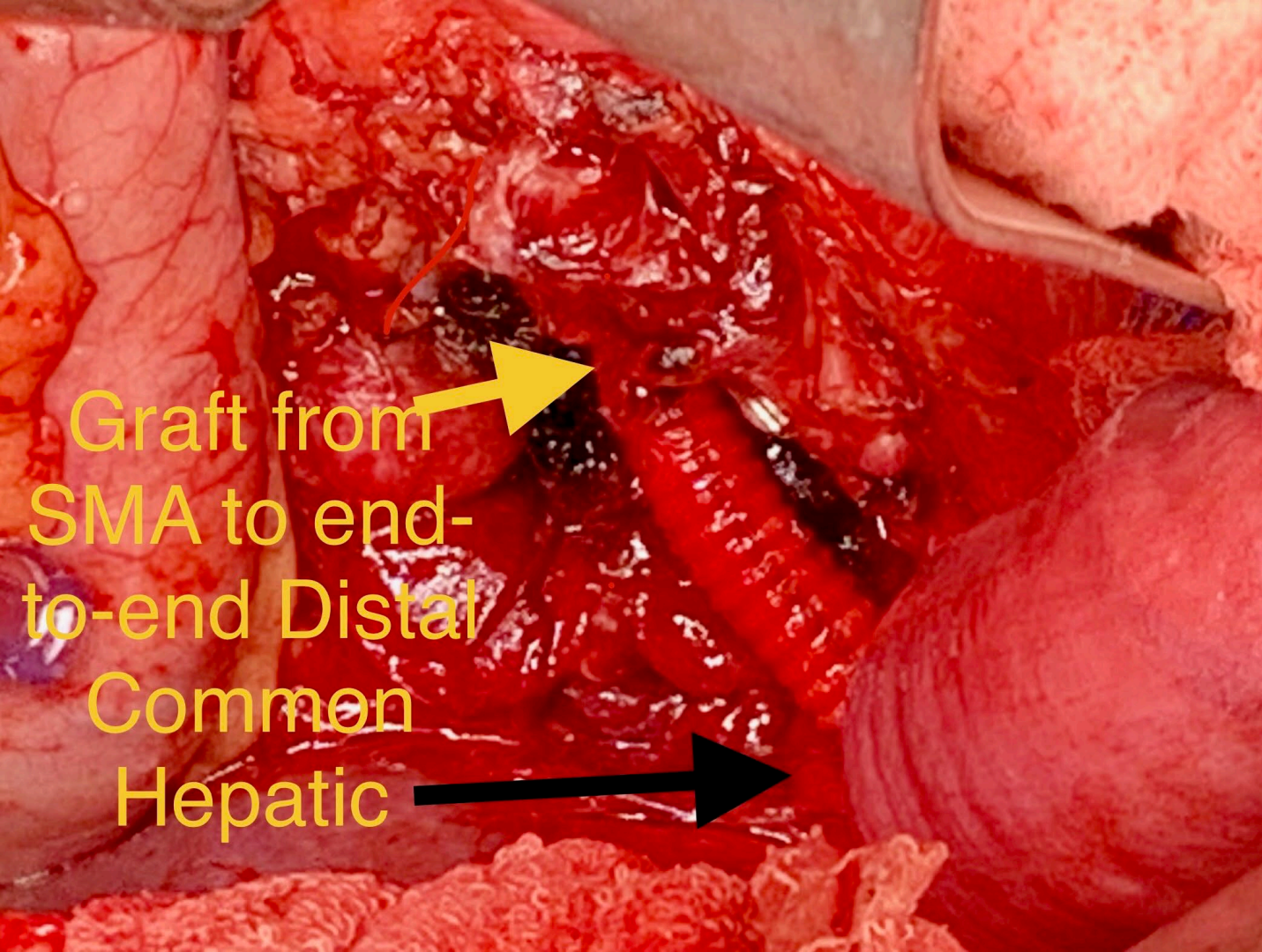
Distal

Prox common

GD
A



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Graft from
SMA to end-
to-end Distal
Common
Hepatic

SMA Aneurysms

Indications

All true SMAAs and PSAs should be repaired regardless of size (1-A)

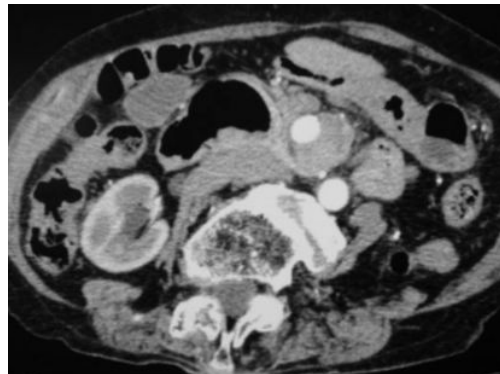
Rx

Endo-first approach if anatomically feasible (1-B)

Coil embolization, covered stents

Must be cognizant of distal collaterals and tributaries

Observation of SMAA because of dissection unless refractory symptoms develop. 2 (Weak), B (Moderate).





SMA Aneurysm. Open repair

- Failure of endovascular therapy
- Risk for end organ compromise



Celiac Artery Aneurysms Rx Indications

Emergent intervention for ruptured CAAs. 1-A

Non-ruptured celiac artery pseudoaneurysms of any size in patients of acceptable operative risk because of the possibility of rupture. 1-B

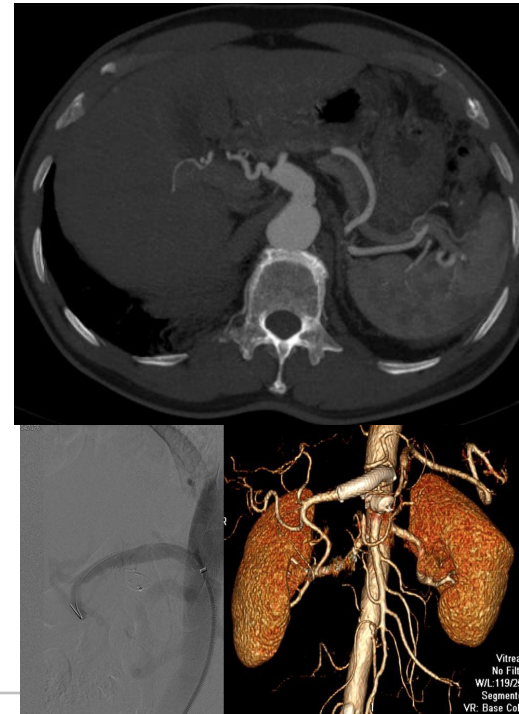
Non-ruptured celiac artery true aneurysms **>2 cm**, with a demonstrable increase in size, or with associated symptoms in patients of acceptable risk because of the risk of rupture. 1-C

Rx

Endo first approach if anatomically feasible (2-B)

coil embolization, stent graft, thrombin/gelfoam injection

Open repair: celiac aneurysmectomy, aortoceliac bypass or ligation/exclusion. Collateral flow via SMA, PDA/GDA



Celiac aneurysms. Open repair

In patients with ruptured CAA discovered at laparotomy, we suggest ligation if sufficient collateral circulation to the liver can be documented.

Level of Recommendation: Grade 2 (Weak), Quality of Evidence: C (Low).



Jejunal/ileal/colic Aneurysms

Indications

Size criteria for intervention:

>2cm for jejunal and ileal artery aneurysms (1-B)

Any colic artery aneurysm or any PSA (1-B)

Rx

Endo first (embolization) (2-B)

Open surgical ligation or aneurysm excision when laparotomy is being considered for hematoma evacuation or bowel assessment for viability (2-B)

If associated w/ polyarteritis nodosa, recommend medical treatment w/ steroids or cytotoxic agents (2-B)



PDA/GDA Aneurysms



Indications

In patients w/ noncomplicated GDAA or PDAA, recommend treatment regardless of size (1-B)

Rx

Coil embolization as the treatment of choice for intact and ruptured aneurysms (1-B)

Covered stent or stent assisted embolization as alternatives (2-C)

Liquid embolic agents or multilayer flow diverting stents (2-C)

Open surgical reconstruction if needed to preserve flow in non-ruptured aneurysms (2-B)

In patients with concomitant stenosis or occlusion, we suggest celiac artery reconstruction. (2-B)





Open Repair

3.5: In patients with non-ruptured aneurysms, we suggest open surgical reconstruction if needed to preserve flow.

Level of Recommendation: Grade 2 (Weak), Quality of Evidence: B (Moderate).

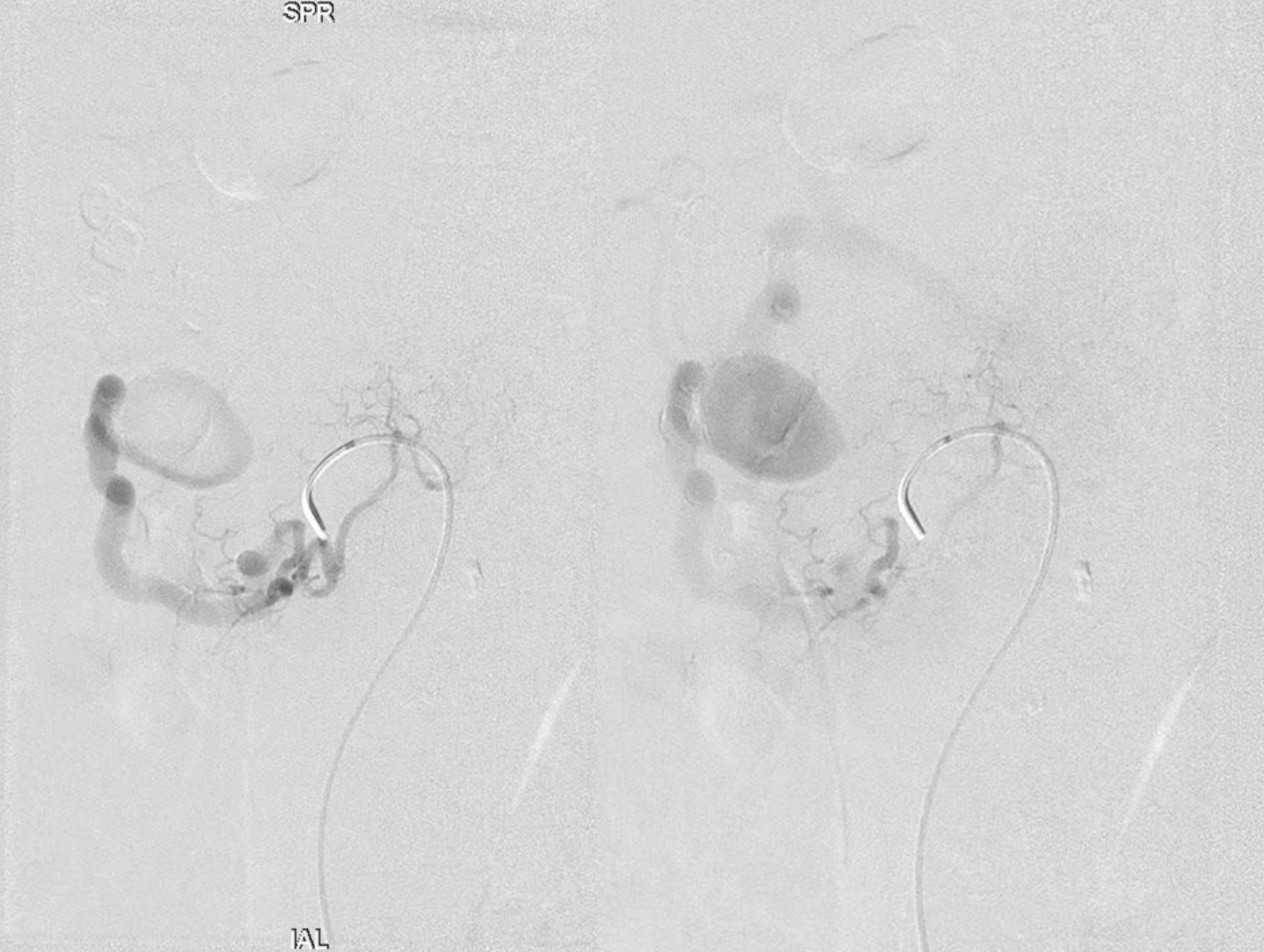


57 yo man with 3.6cm GDA aneurysm, asymptomatic

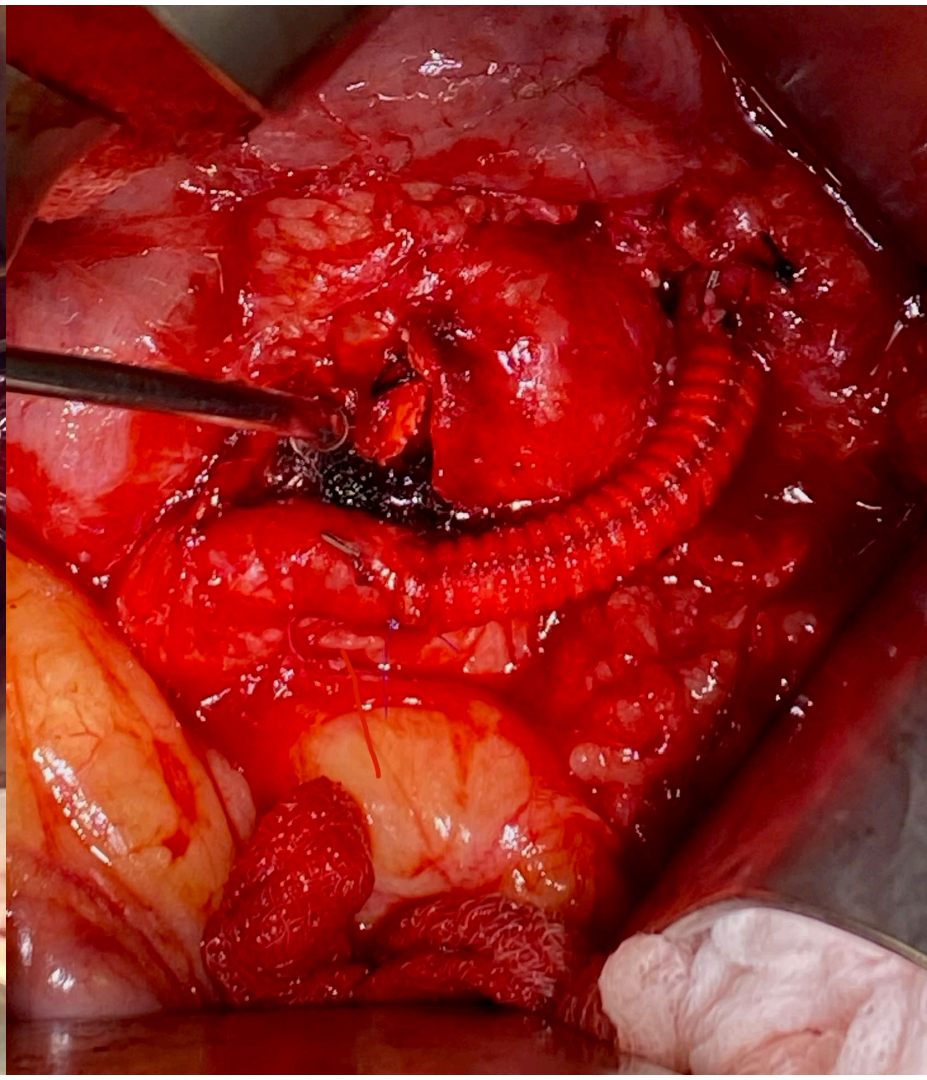
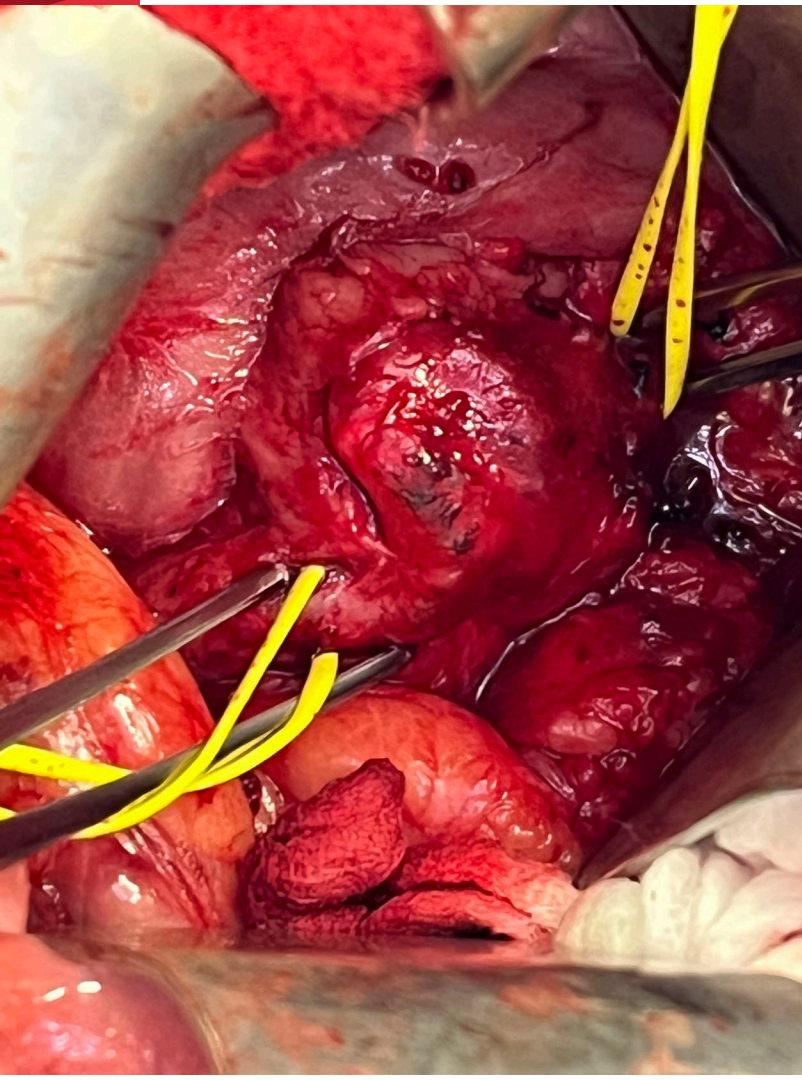




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Gastric/gastroepiploic aneurysms

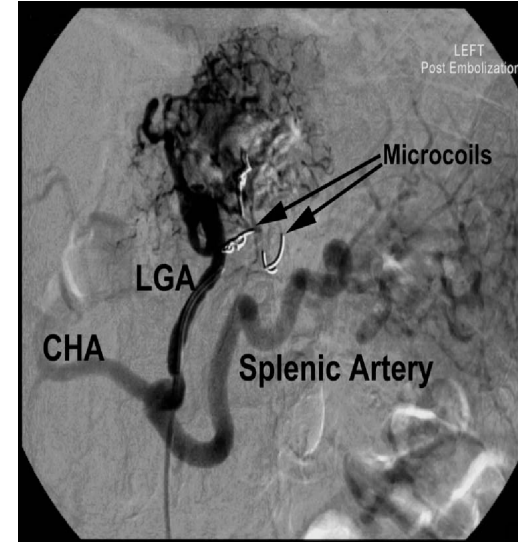
Indications

Treat all gastric and gastroepiploic artery aneurysms, regardless of size (1-B)

Rx

Endovascular embolization is first-line treatment (1-B)

Open repair with ligation for failed endovascular therapy.



Conclusions

Endo first approach per SVS guidelines, if anatomically feasible

Open repair for :

1. RAAs
2. Un-successful endovascular attempt/therapy
3. Aneurysm related exceptions to endo repair

Mycotic aneurysms

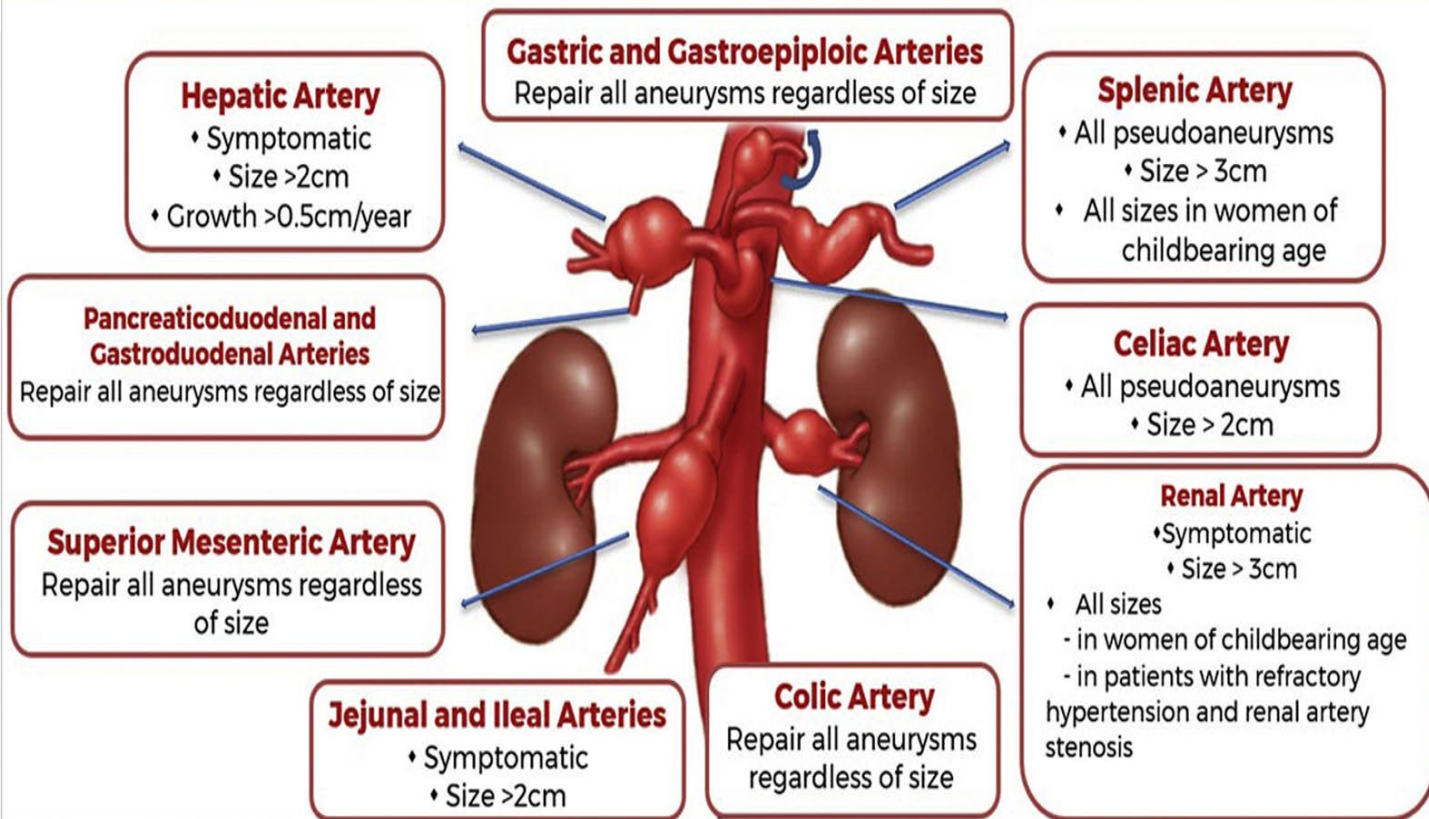
Anatomic limitations (tortuosity, dissection, seal zone)

End organ compromise

Individualized, patient-centered treatment is key



SVS Clinical Practice Guidelines on the Management of Visceral Aneurysms



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