Open Versus Endovascular Treatment For Visceral Artery Aneurysms And Acute Mesenteric Ischemia: When Is Open Surgery Mandatory

Timur P. Sarac, M.D.

Professor of Surgery
University of Virginia UVA Health Systems
Charlottesville, Virginia

Emeritus Professor, Chief & Director of the Aortic Center
The Ohio State University

Disclosure

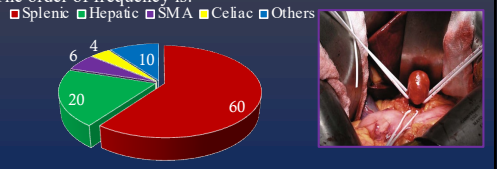
- M Stent patents, AAA stent patents, endoleak patents.
- Shape Memory Medical Trial Proctor
- Editor "Gateways in Vascular Surgery"

- Treasurer American Board of Vascular Surgery
- Highly Opinionated

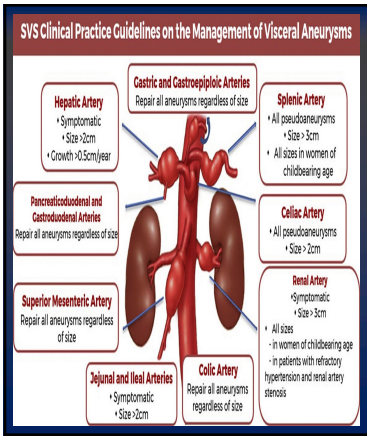
Visceral Artery Aneurysms

Prevalence and Etiology

- They account for 5% of all intra-abdominal aneurysms occur in 0.1-2% of the population.
- The order of frequency is:



- 1/3 associated with non-splanchnic aneurysms
- 1/4 present ruptured, and a high rupture mortality w/ up to 100% in pregnant women.



Repair for the following:

2 cm
- Hepatic
- Celiac
- Jejunal & iliac

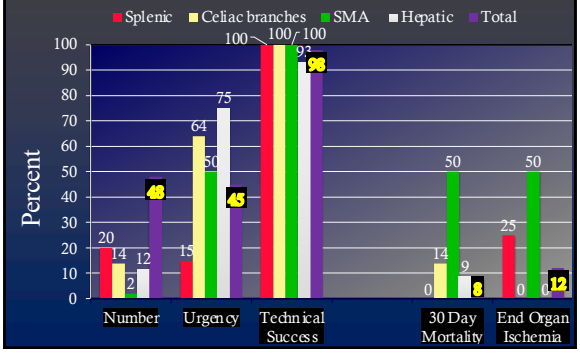
3 cm
- Splenic
- Renal

Any Size
- SMA
- Colic
- Pancreatic-duodenal
- Gastro-epicolic
- Pseudo aneurysm
- Symptomatic/rupture
- Child-bearing age

Outcomes of Endovascular Therapy Are Good

Tulysan, Kashyap, Sarac J Vasc Surg. 2007 Feb;45(2):276-83;

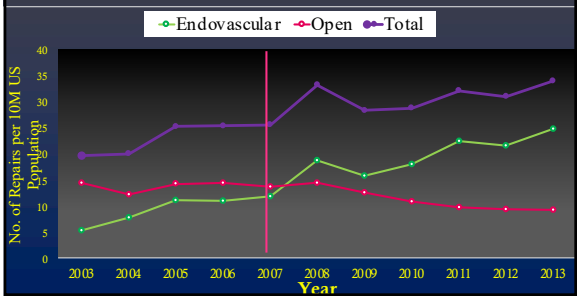
90 pts, 48 treated over 8 years



Comparison Open vs Endovascular Therapy for Visceral Artery Aneurysms

Chin, Heib, Sarac. J Vasc Surg. 2017; Jul;66:195-201

- National In-patient database
- 9260 patients over 10 years



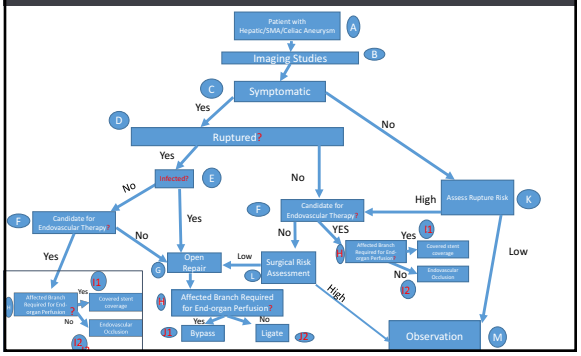
Results: Outcomes

Chin, Heib and Sarac. J Vasc Surg. 2017 Jul;66(1):195-201

Outcome/complications	Endo (n = 5166)	Open (n = 4094)	P-value
Mortality	4.1	4.5	.618
Any complication	37.8	38.8	.668
Cardiovascular complication	2.3	3.4	.132
Bleeding complication	24.7	21.2	.080
Pulmonary complication	10.6	19.7	<.0001
Acute renal failure	9.5	7.4	.111
Wound complication	3.7	3.8	.913
Length of stay (days, mean)	6.5	8.7	<.0001
Discharge destination			.015
Home (with or without help)	86.7	84.4	
Facility	8.7	11.0	

Treatment Algorithm Endovascular vs Open Repair

from T. Sarac in "Vascular Decision Making" Cronenwett et al



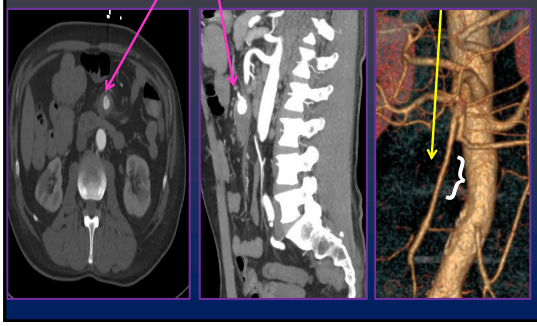
When to use Open Surgery?

	Open	Endovascular
Elective	x	x
Distal Branch Points	x	x
Ruptured	x	x
Saccular	x	x
Hilum	**X**	
Mycotic	**X**	
Branch Points Leading to End Organ Ischemia	**X**	

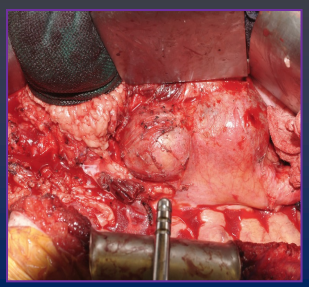
Who Is NOT an Endovascular Candidate?

Mycotic Distal SMA aneurysm

Long Vein Bypass

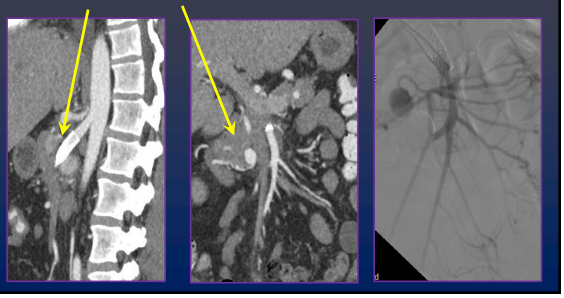


Mycotic Celiac Aneurysm

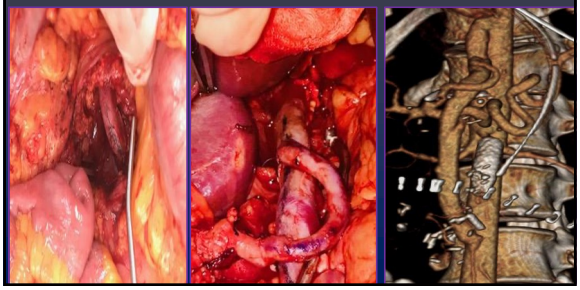


Mycotic SMA & Pancreatico-duodenal Artery Aneurysm – Septic Endocarditis Patient

Access Jailed By Stent Graft



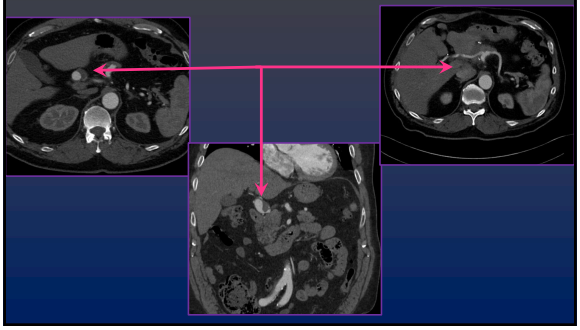
Open Repair with Ligation of Branches and Deep Vein Bypass to SMA and GSV to Hepatic



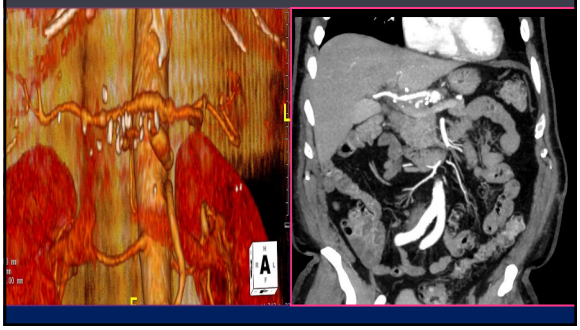
SMA Major Branch Point Ileocolic Artery

Replaced Right Hepatic Artery

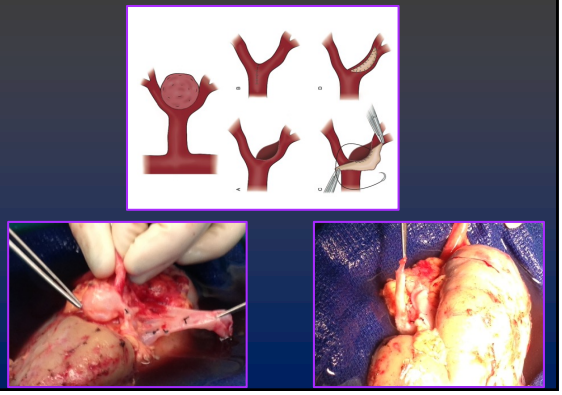
Distal Hepatic Artery Aneurysm w/ No Langing Zone



Spleno-Hepatic Bypass

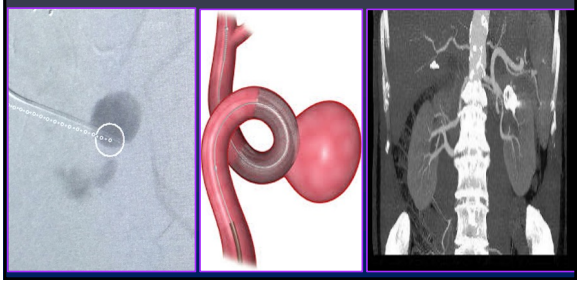


Distal Hilar Renal Artery Aneurysm



The Cost of a Pipeline Stent and coils for Branch Renal Artery Aneurysm?

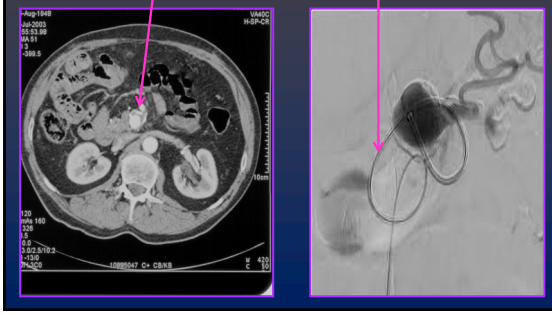
$25,000



On The Fence

No Direct Access

Tortuosity Precludes Tracking



Recommendations:

1. Endovascular treatment includes stent grafts and coil embolization.
   - This is the first line of therapy for some but not all VAA.
2. Open surgery is indicated for mycotic aneurysms, branch point aneurysms, and end vessel aneurysms.
   - Open surgery includes bypass, direct repair, and ligation.
3. Treat all patients with VAA who are symptomatic or pregnant.
4. Preservation of antegrade flow is preferred but not always necessary. This depend on the vessel treated and avoidance of end organ ischemia.

Vascular Surgeons