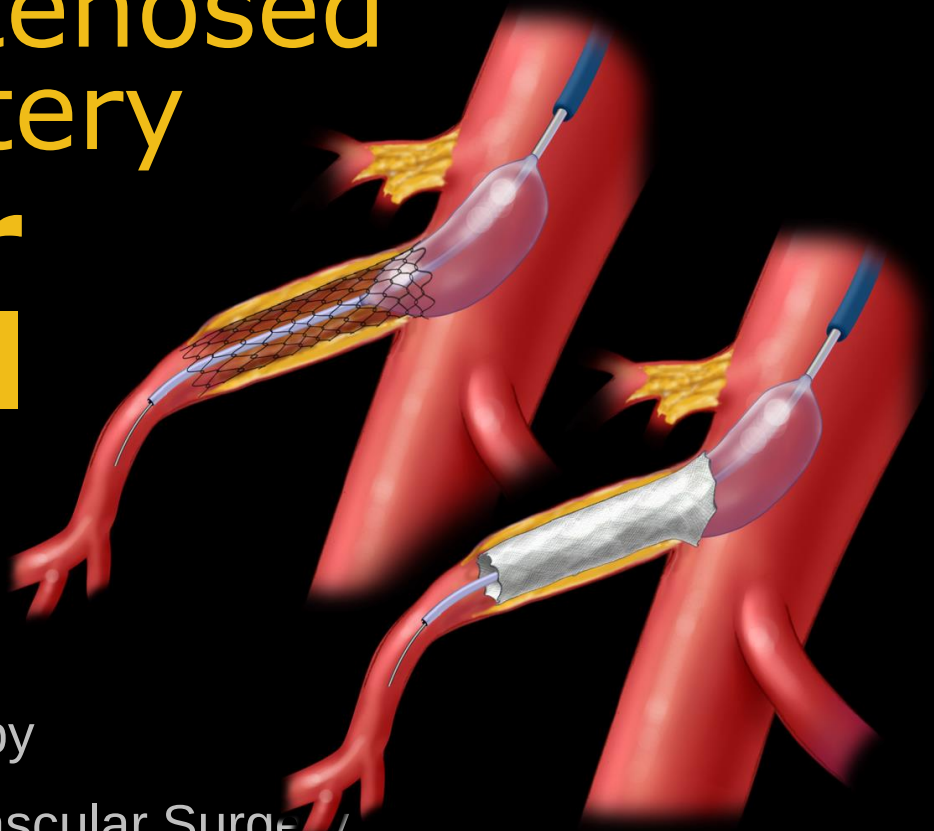
Occluded or stenosed mesenteric artery

Covered or Bare-Metal Stents?



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Disclosure

Consulting:

Cook Medical Inc.
WL Gore
(Fees paid to Mayo Clinic)

Off-label use:

Bare-Metal and Covered Balloon Expandable Stents for mesenteric stenosis

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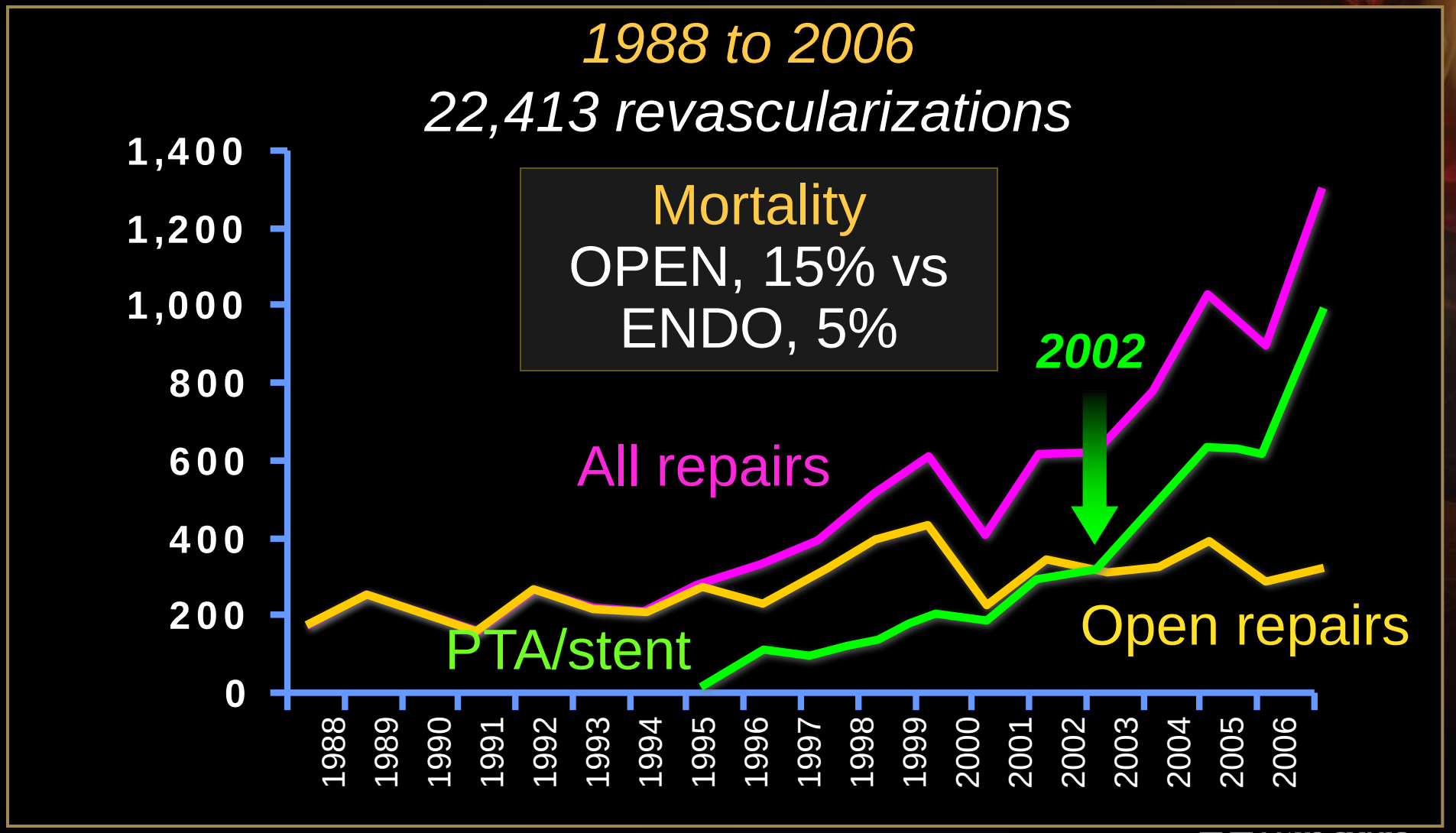
Mesenteric revascularization

Trends in the United States



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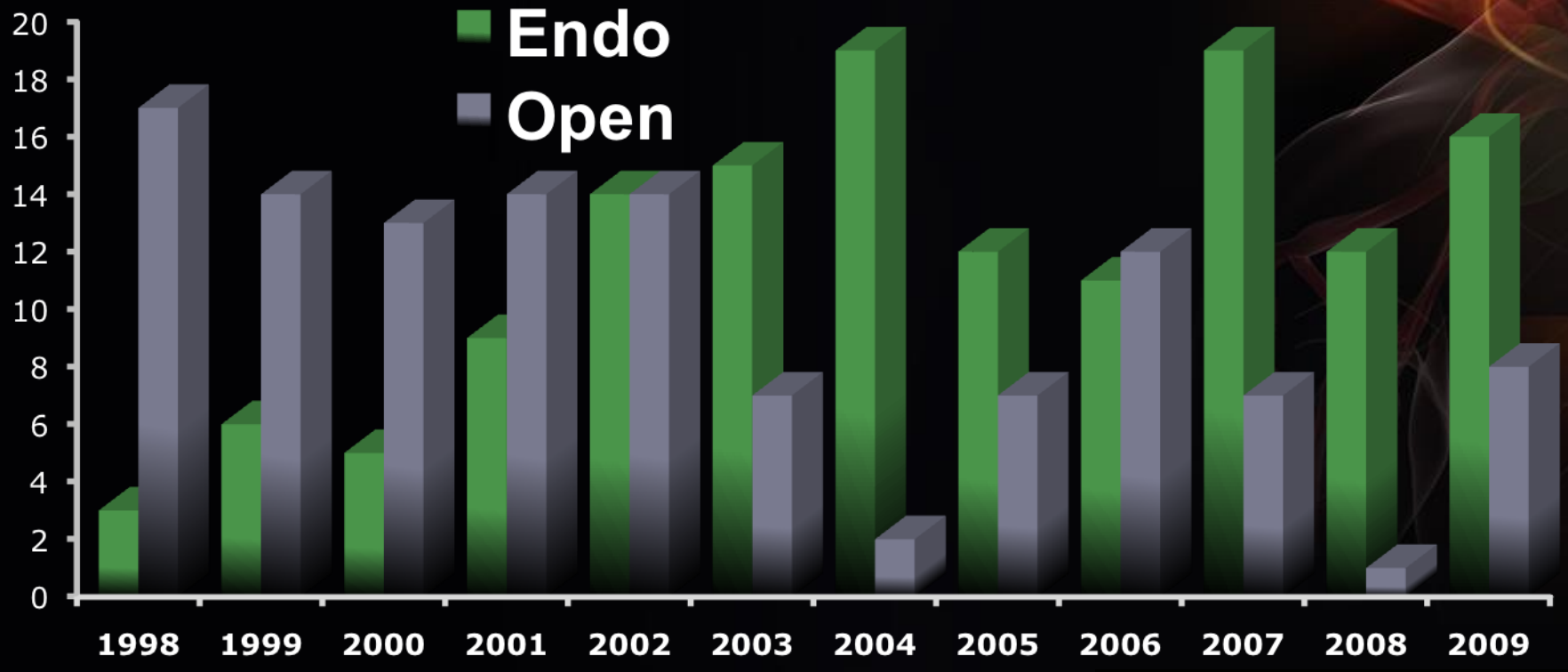
Schemerhorn M et al. J Vasc Surg 2009;50:341-8

Mesenteric revascularization

Change in paradigm

257 patients
(1998-2009)

2000-2013
>90% Endovascular



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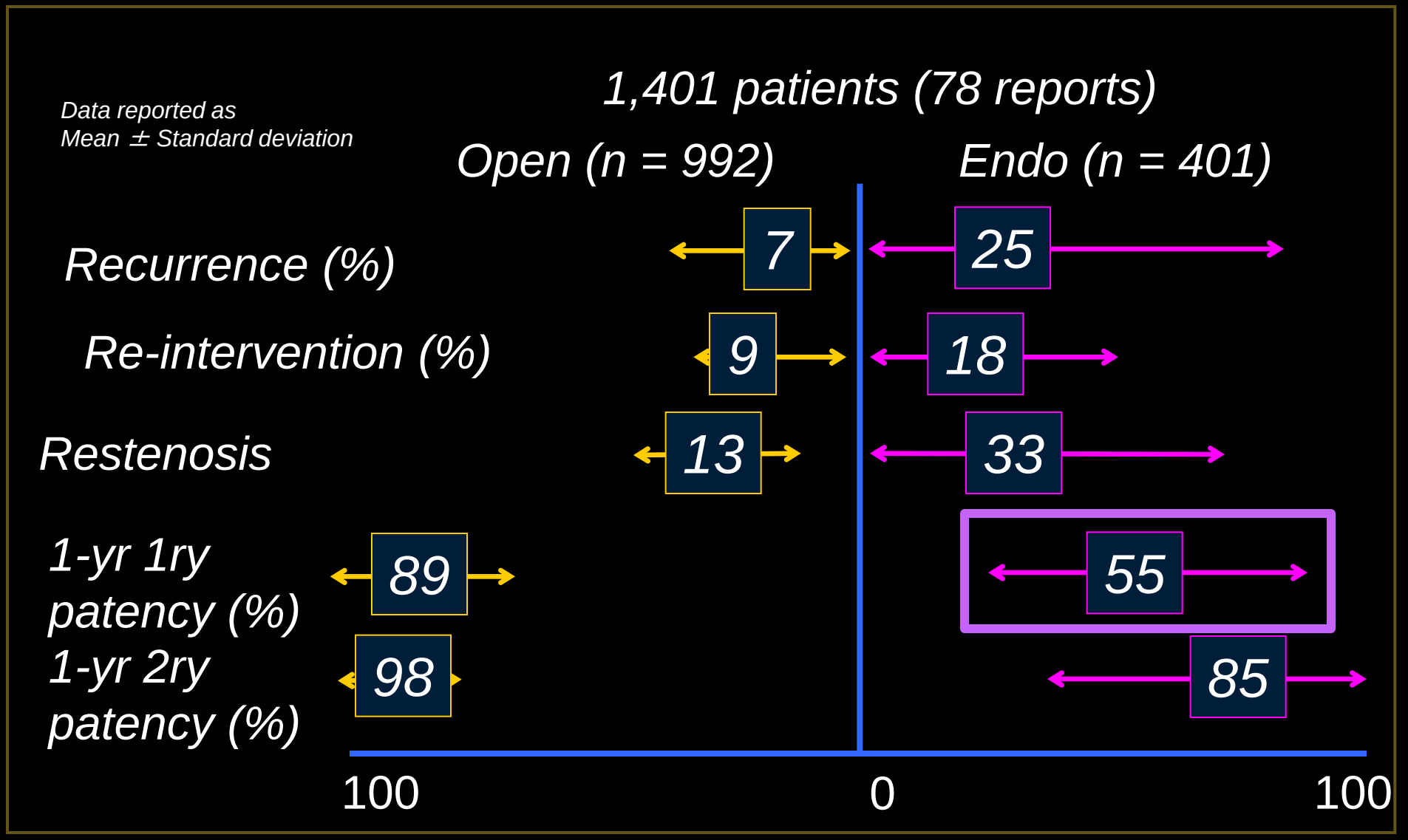
Mesenteric revascularization

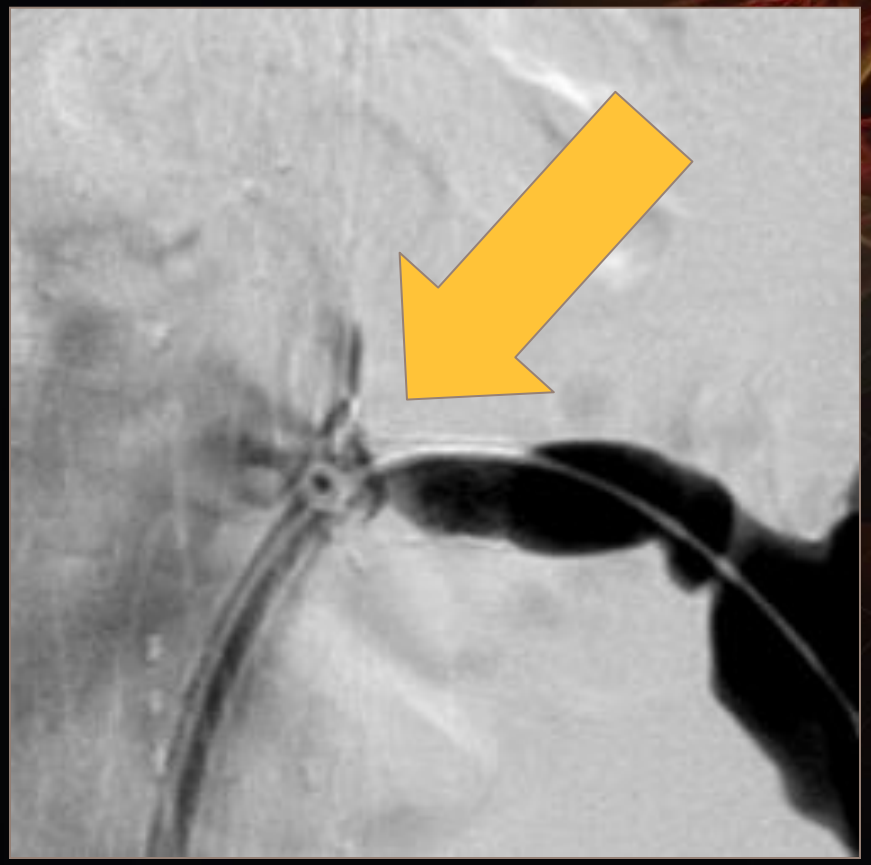
Results in 1,401 patients



Oderich GS et al. Ann Vasc Surg 2009;23;5:700-712.

Rationale for covered stents

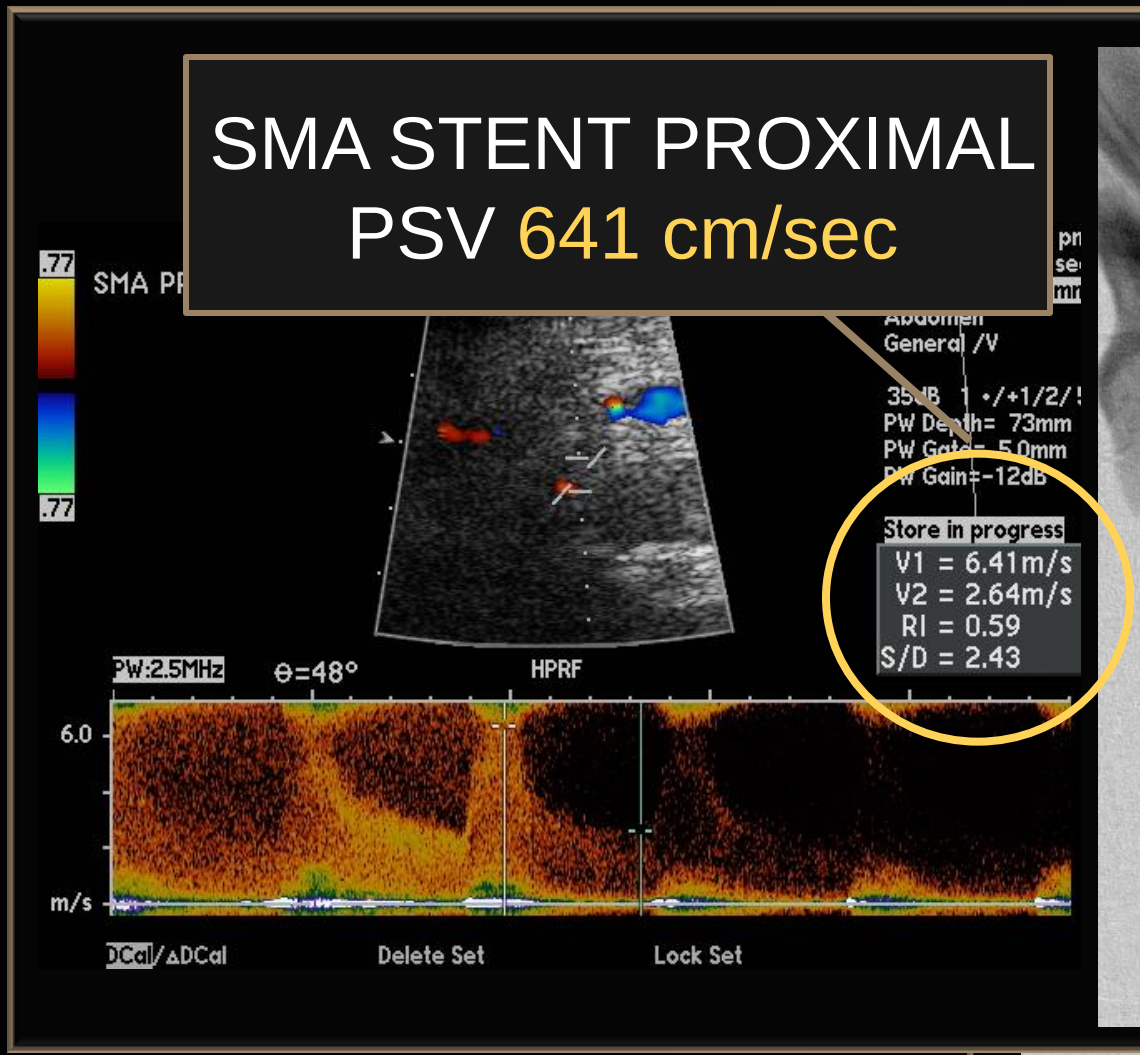
- High rate (30-60%) of restenosis and re-intervention with bare-metal stents
- Improved patency of covered stents:
  - AV fistulas
  - FEVAR
  - Iliac occlusive disease



Mesenteric restenosis

Treatment by covered stents

SMA STENT PROXIMAL
PSV 641 cm/sec



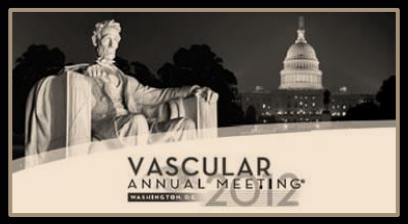
Comparison of Covered Stents versus Bare-Metal Stents

for treatment of chronic mesenteric ischemia

Gustavo S. Oderich[1], Luke S. Erdoes[2], Christopher LeSar[2],
Bernardo Mendes[1], Peter Gloviczki[1], Audra A. Duncan[1], Manju Kalra[1], Sanjay Misra[1], Stephen Cha[1] and Thomas C. Bower[1]

[1]Mayo Clinic, Rochester and [2]University of Tennessee, Chattano

Journal of Vascular Surgery 2013



Vascular Annual Meeting 2012
National Harbor, Washington DC

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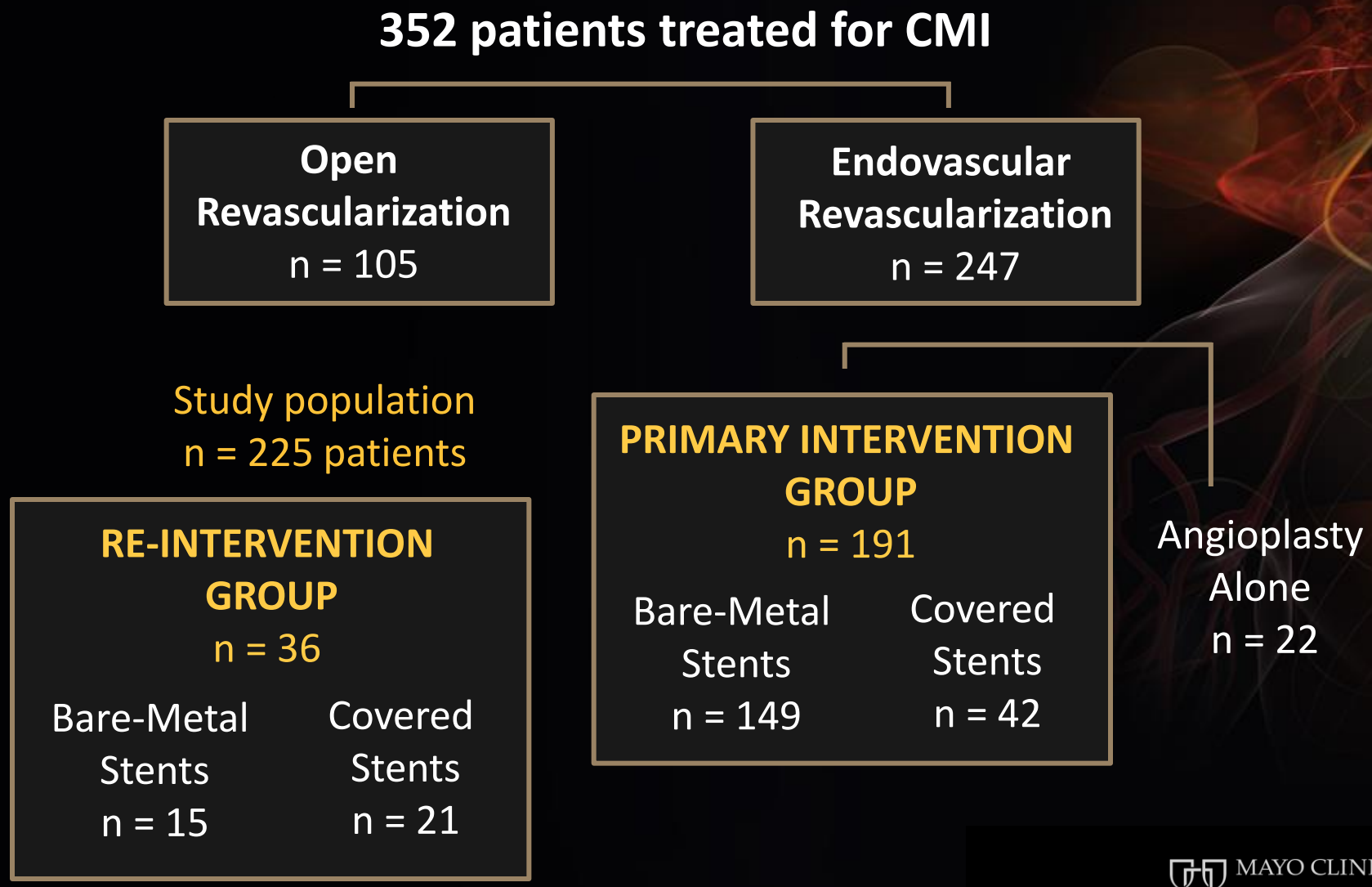
Patients

Interventions for CMI (2000-2010)



Oderich, Erdoes et al. J Vasc Surg 2013

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Primary intervention group
Clinical characteristics

	BARE-METAL STENTS *n* = 149 patients	COVERED STENTS *n* = 42 patients	P value
	% or Mean ± Standard Deviation		
Female gender	67	74	.48
Mean age (yrs)	73±11	72±10	.91
Hypertension	87	86	.82
Coronary artery disease	64	67	.84
Hyperlipidemia	63	62	.90
Cigarette smoking	60	52	.23
Chronic pulmonary disease	30	14	.06
Diabetes	25	29	.67
Chronic Kidney Disease > Stage III	23	17	.52
Clinical presentation			
Symptom duration (months)	13 ± 22	11 ± 18	.91
Abdominal pain	90	95	.54
Weight loss	81	74	.60
Diarrhea	26	23	.72

Primary intervention group

Anatomical & procedural details

	BARE-METAL STENTS *n* = 149 pts/ 181 vessels	COVERED STENTS *n* = 42 pts/ 45 vessels	P value
	% or Mean ± Standard Deviation		
Extent of mesenteric disease*			
Celiac axis	84	67	.15
SMA	90	83	.92
IMA	76	79	.95
Procedural details			
Femoral approach	68	67	.89
Number of vessels treated	1.2 ± 0.4	1.1 ± 0.3	.16
Single-vessel stenting	78	76	.92
Celiac	38 (57 vessels)	31 (13 vessels)	.87
SMA	80 (119 vessels)	74 (31 vessels)	.72
IMA	3 (5 vessels)	2 (1 vessel)	.95
Stent length (mm)	19±7	19±5	.87
Stent diameter (mm)	6.3±0.9	6.2±0.5	.39
Number of Stents/Vessel	1.2±0.7	1.2±0.5	.76

**** Mesenteric disease,*** stenosis >50% or occlusions

Early outcomes

Primary intervention group

	Bare-Metal Stent *n* = 149	Covered Stent *n* = 42	P value
	%		
Technical success*	95	98	.74
Procedural complications	1	5	.87
Mortality	3	0	.67
Morbidity	12	15	.76
Length of stay	1.5±2.1	1.3±2.4	.88
Symptom improvement	93	92	.9

**** Technical success,*** successful stent impant with no local complication or stenosis <30%

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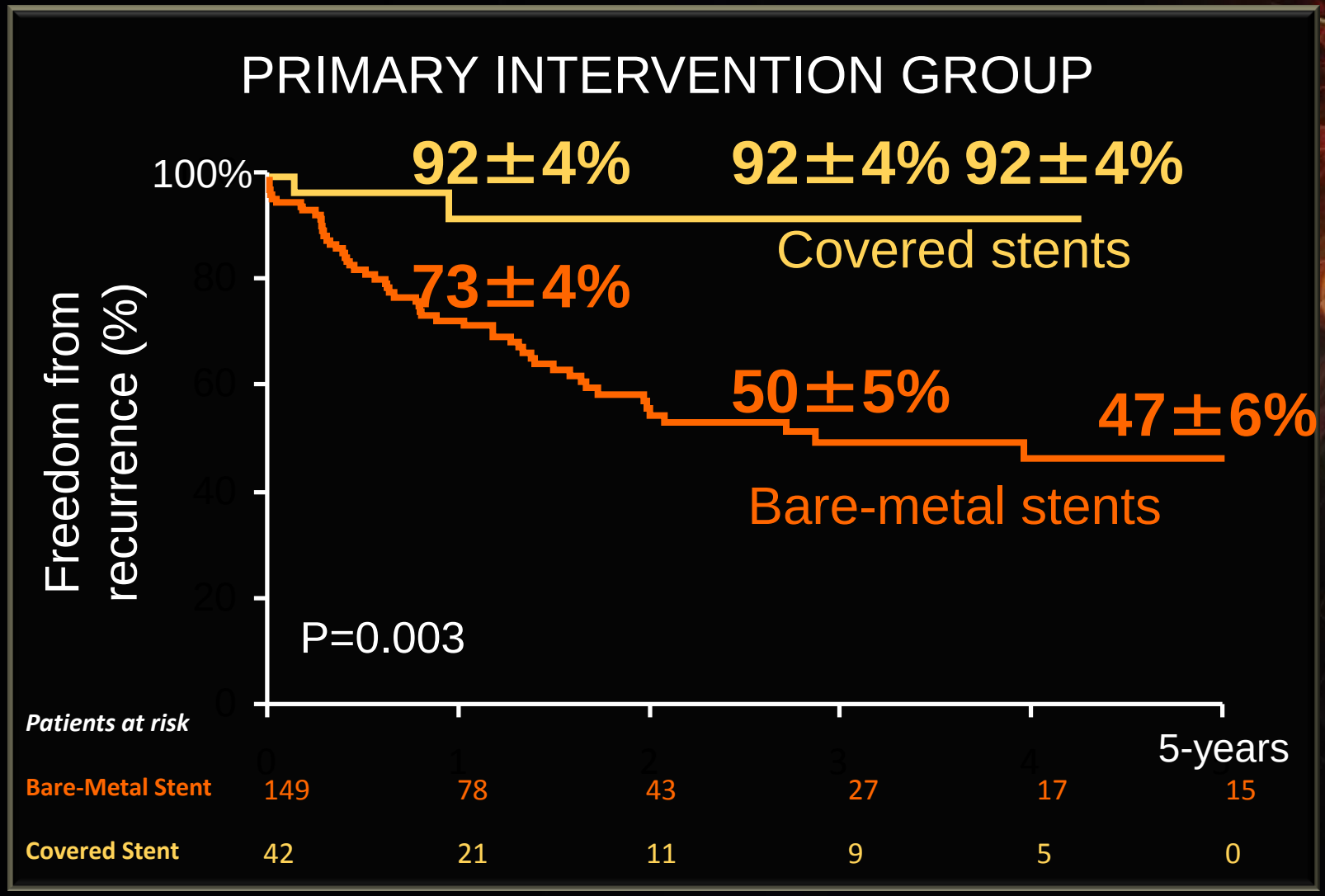
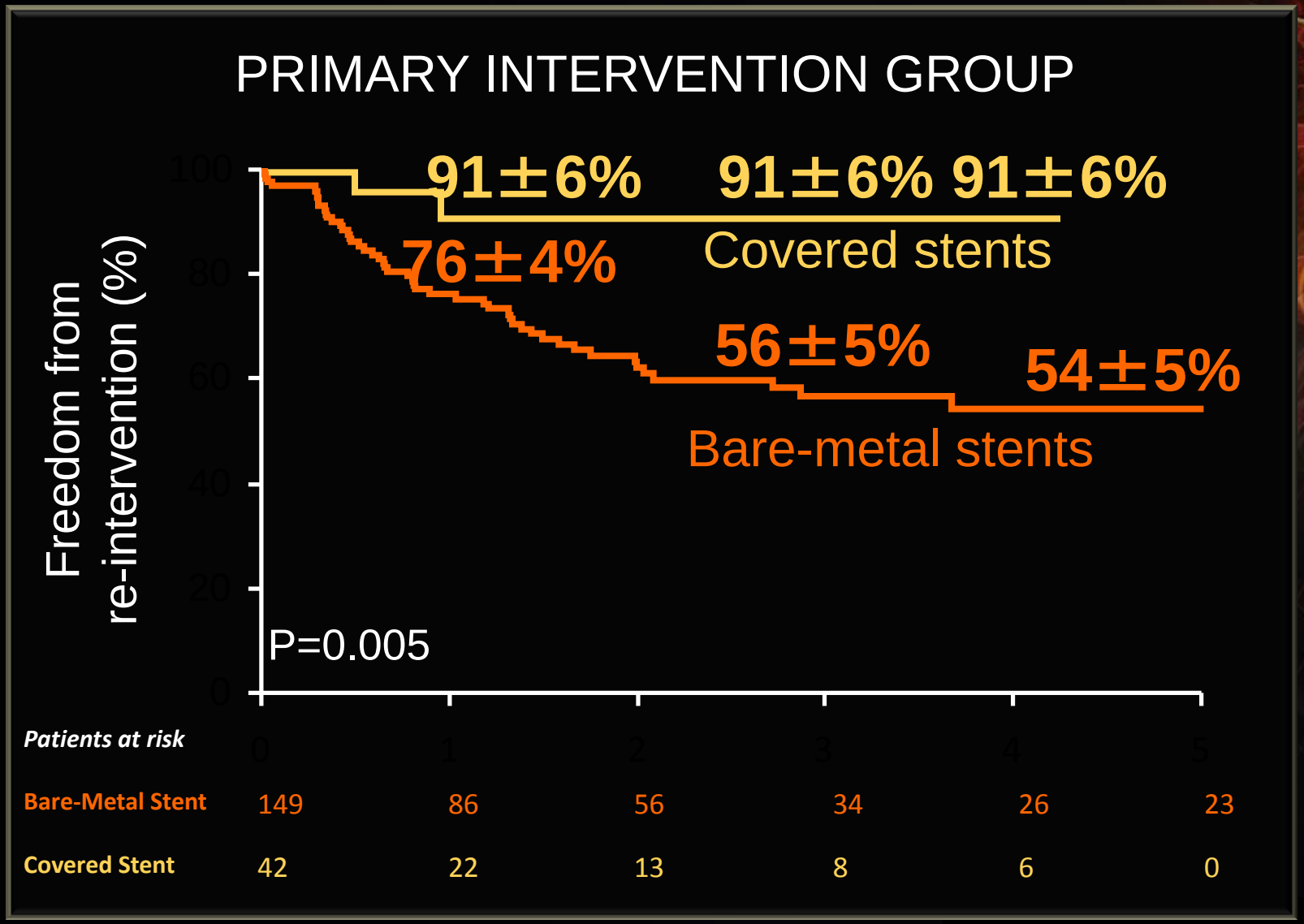
Symptom recurrence



Mean follow up, 29 months (3 to 132)

Bare-Metal stents (32±20) vs Covered stents (19±12) P<0.05

Freedom from re-intervention



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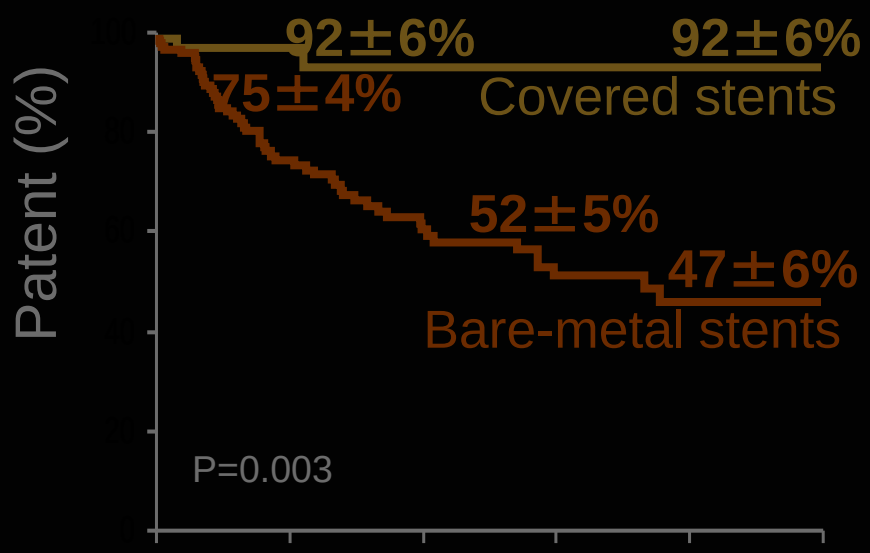
Patency rates

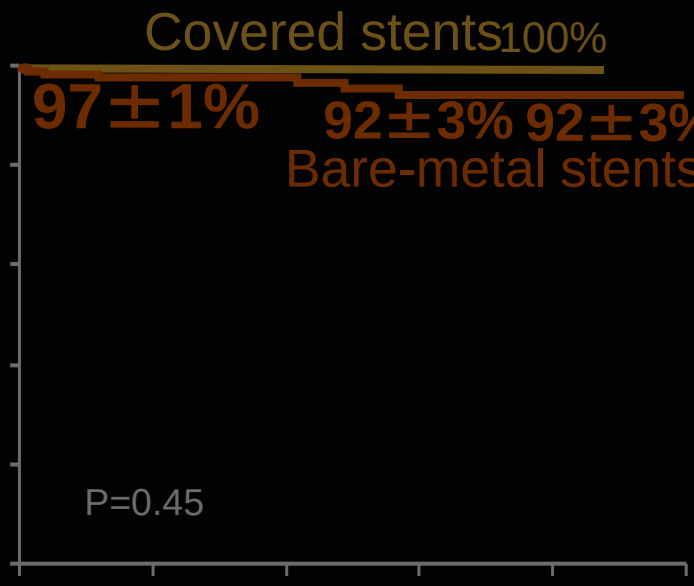
PRIMARY INTERVENTION GROUP

Primary Patency



Vessels at risk						
Bare-Metal Stents	181	85	53	33	20	17
Covered Stents	45	21	14	9	6	0

Secondary Patency



Vessels at risk						
Bare-Metal Stents	181	106	78	51	27	20
Covered Stents	45	25	15	9	6	0

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Multivariate analysis

Primary intervention group

Independent predictors of	Hazard Ratio	95% Confidence Interval		P value
		Lower	Upper	
Loss of primary patency				
Covered stents	0.13	0.032	0.58	.0073
Age	0.98	0.96	0.99	.0074
Female gender	2.2	1.09	4.57	.028
Current smoking history	1.88	0.84	4.20	.12
Symptom recurrence				
Covered stents	0.14	0.034	0.574	.0063
Female gender	2.49	1.24	4.97	.0096
Current smoking history	3.11	1.53	6.29	.0016
Re-intervention				
Covered stents	0.14	0.035	0.60	.0080
Age	0.96	0.95	0.98	.0008
Female gender	3.2	1.5	6.8	.0022

Re-intervention group

Late outcomes

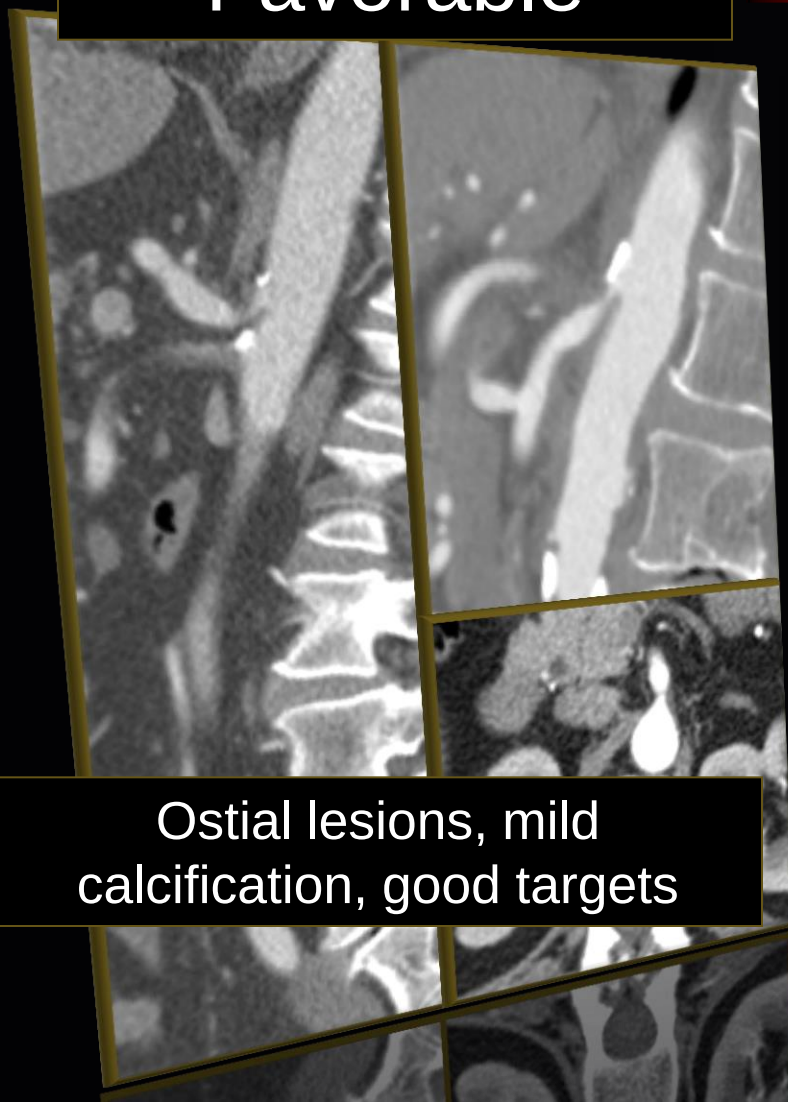
Kapla-Meier estimates	Bare Metal Stents N = 15 pts/16 vessels	Covered Stents N=21 pts/22 vessels	P value
Freedom from recurrence	**64±9%**	**90±10 %**	.003
Freedom from re-intervention	**72±10%**	**89±10 %**	.003
Primary patency	**23±18%**	**62±15 %**	.0054
Secondary patency	**78±14%**	**100%**	.09

Oderich, Erdoes et al. J Vasc Surg 2013

Mesenteric revascularization

Treatment selection

Favorable

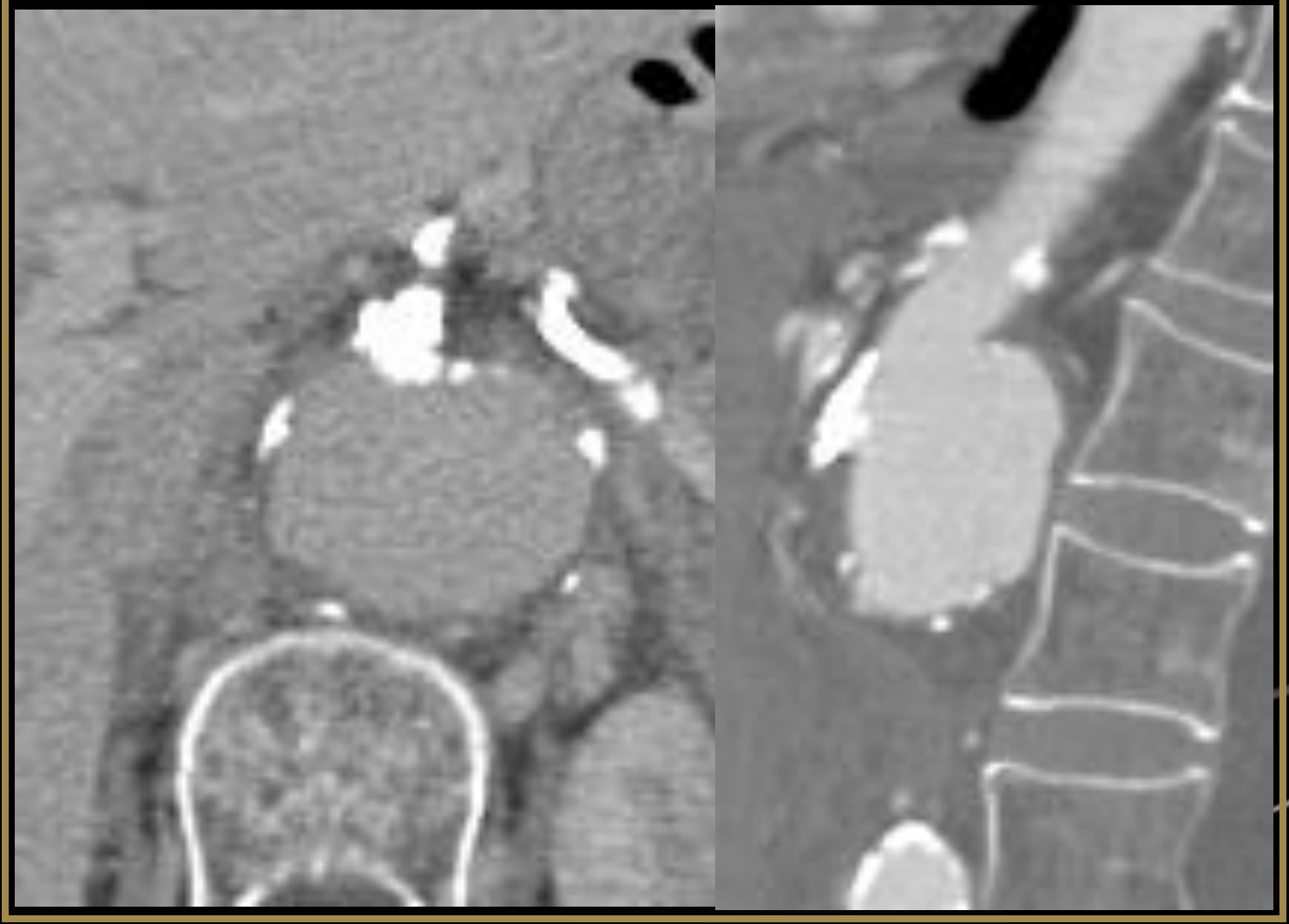


Ostial lesions, mild calcification, good targets

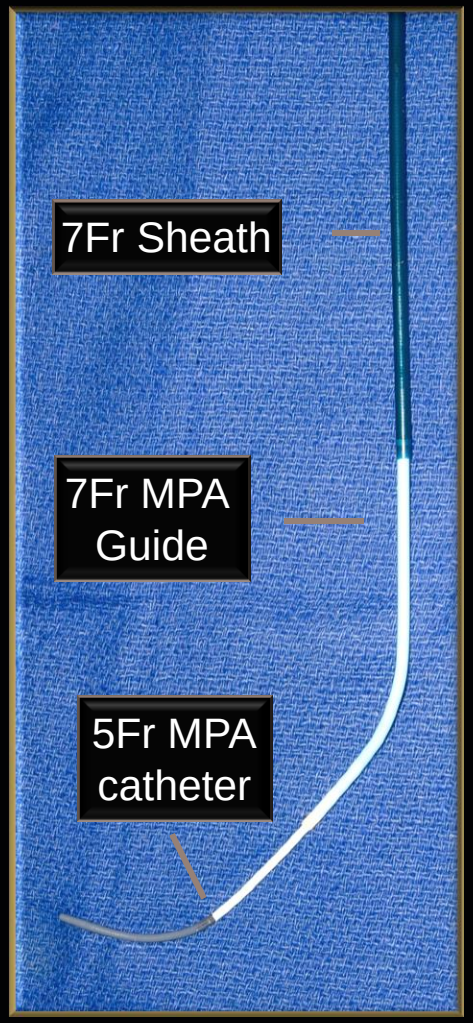
Unfavorable

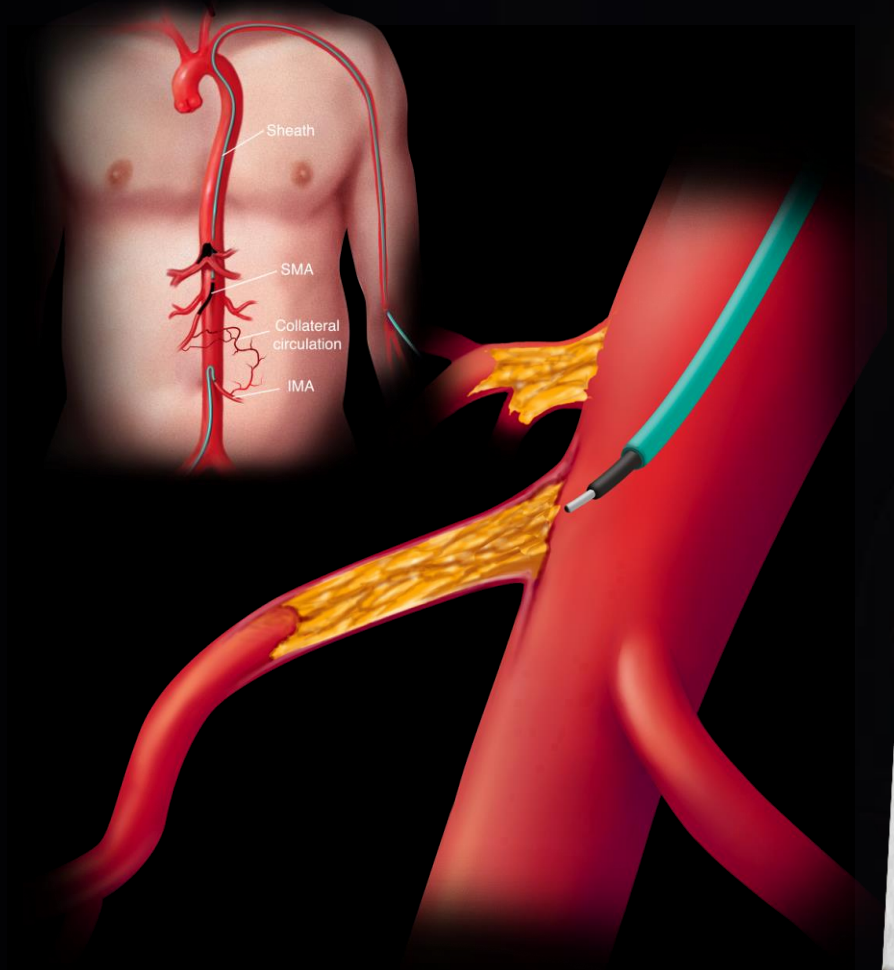
Long lesions, diffuse calcification, occlusions

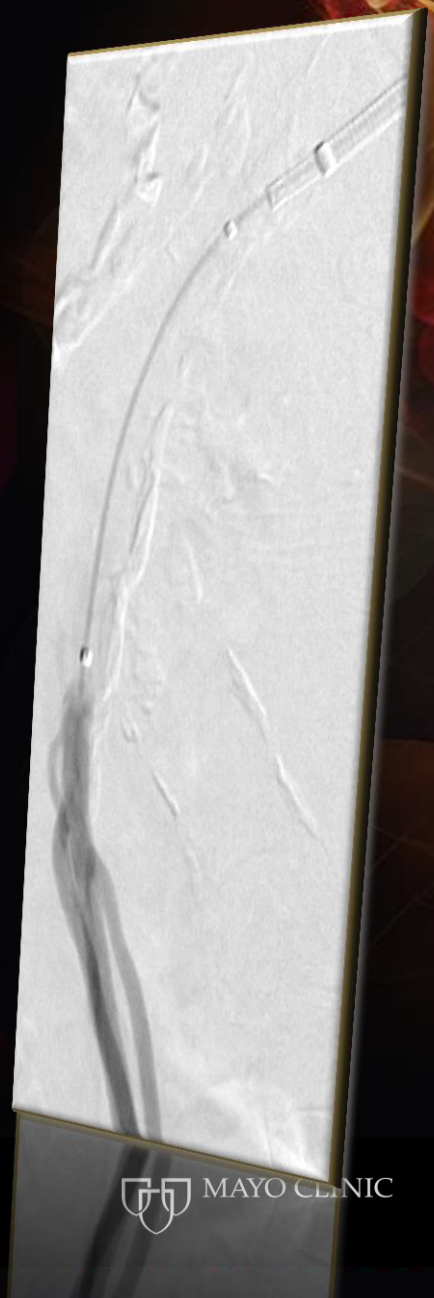
78-year-old female with CMI, severe COPD and type IV thoracoabdominal aneurysm



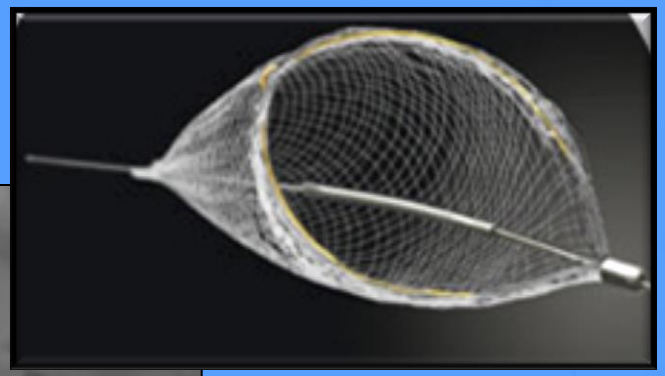
Support system

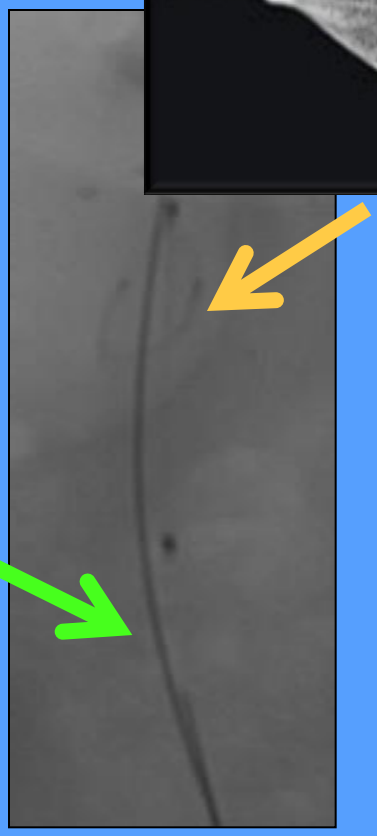


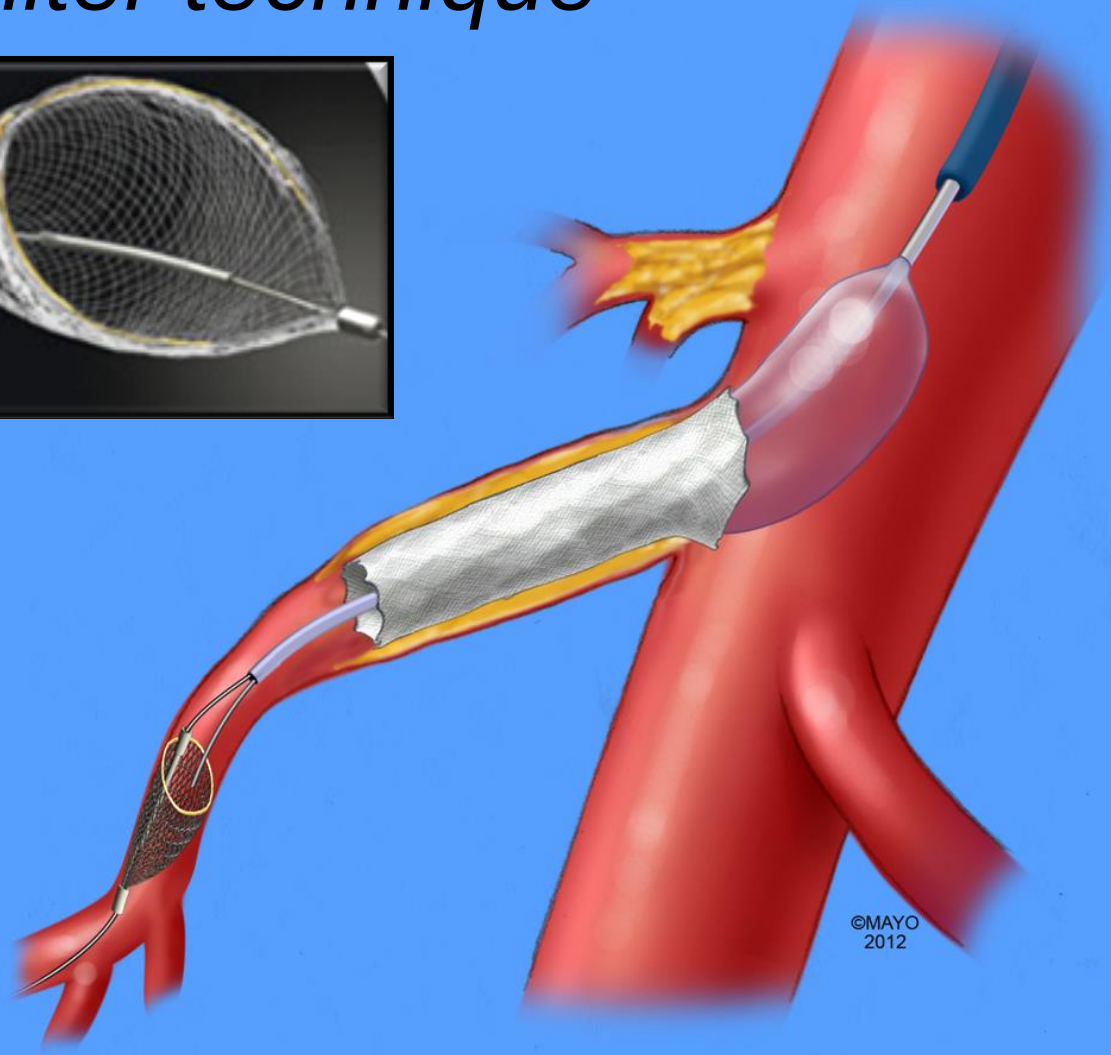




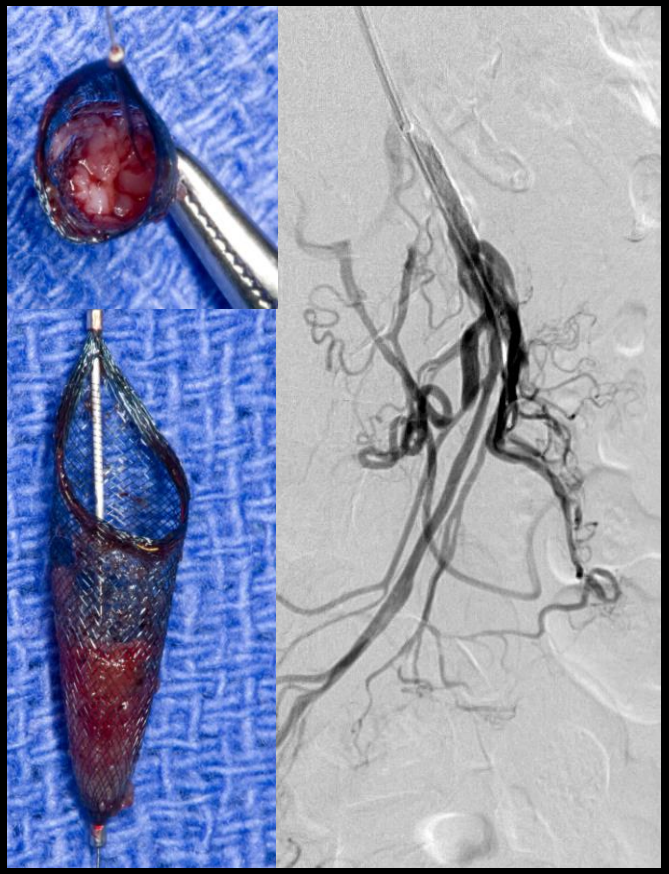
Two-wire filter technique







Spider RX 0.014” FilterWire (320cm) + 0.018” Buddy Wire

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Covered versus Bare-Metal Mesenteric Stents?

Conclusions

- Covered stents are associated with less recurrences and re-interventions in patients undergoing primary interventions or re-interventions for chronic mesenteric ischemia
- Primary patency is significantly higher for covered stents as compared to bare-metal stents in the primary intervention group
- Our practice has changed to primary stenting using a covered stent whenever the anatomy is suitable

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