Endovascular Mesenteric Artery Revascularization: Has it Improved Outcomes of Acute Mesenteric Ischemia?
Stents vs Covered Stents

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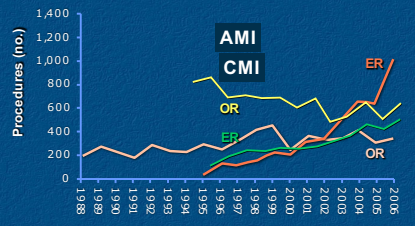
Disclosures

- No Financial Disclosures

Open and Endovascular Revascularization For Acute and Chronic MI in the US



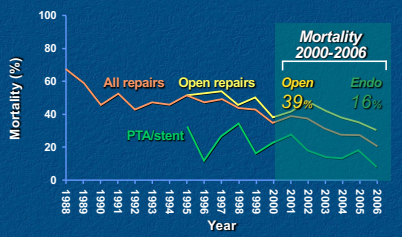
Schermerhorn et al: J Vasc Surg 50:341, 2009

Acute Mesenteric Ischemia
Endovascular Treatment

- Unlike for CMI has not been widely adopted
- Urgency of the need for bowel assessment in severe AMI limits its applicability
- Requires advanced endovascular expertise
- Can be a prolonged challenging procedure with potential delay to laparotomy
- Endovascular first strategy for AMI has been adopted by major centers

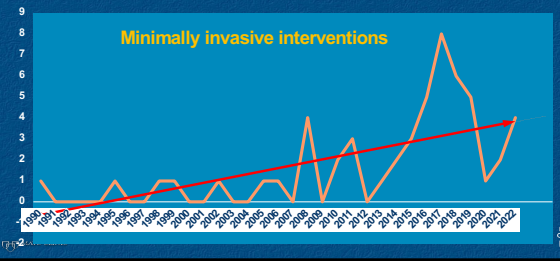
Arthurs ZM et al. J Vasc Surg. 2011; 53(3)698-74

Mortality Rates for Revascularization For Acute MI in the US



Schermerhorn et al: J Vasc Surg 50:341, 2009

Temporal Trend in Modes of Mesenteric Revascularization



Mayo Experience

169 patients

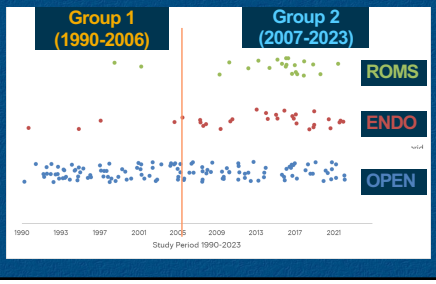
Patients in Group 2
- Older (71 vs 67 years)
- Greater proportion on statin therapy

Median age = 71 years

= 60%

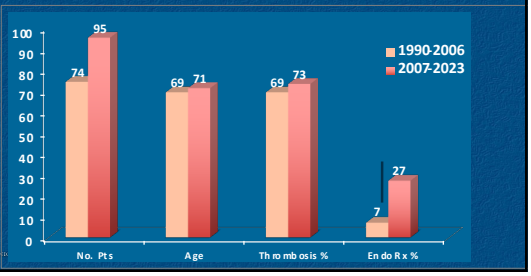
	Group 1 (1990-2006)	Group 2 (2007-2023)	P value
Median age (IQR)	69 (58-78)	71 (63-81)	0.03
Hypertension	57 (77%)	81 (85%)	0.17
Hyperlipidemia	17 (23%)	70 (74%)	<0.001
Smoking	50 (67%)	66 (70%)	0.79
CAD	33 (45%)	51 (54%)	0.24
CVD	15 (20%)	28 (29%)	0.14
Atrial fibrillation	15 (20%)	31 (33%)	0.08
h/o of CMI	30 (42%)	40 (42%)	0.96
h/o intervention for CMI	13 (19%)	14 (15%)	0.37
Median SVS score	10 (5-12)	10 (7-13)	0.23

Mesenteric Revascularization

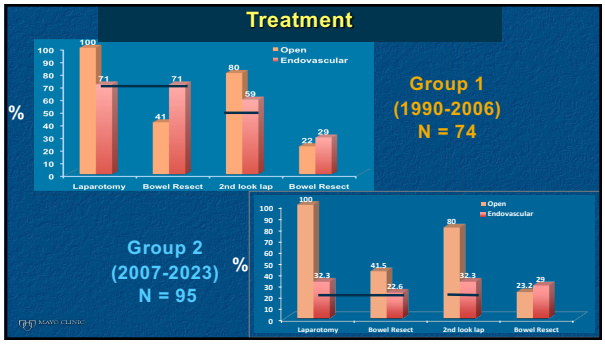


Acute Mesenteric Ischemia

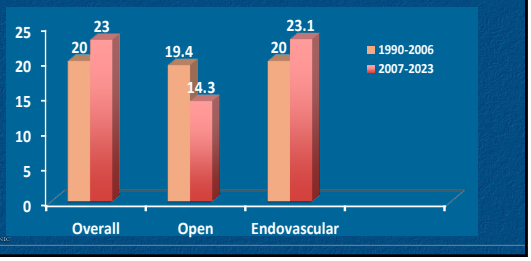
Patients: n = 169



Treatment



In Hospital Mortality



30-day mortality

Univariate Analysis

	OR	95% CI	P value
Female	0.47	0.2-0.9	0.04
Dialysis dependent	21.6	3.3-425	0.006
SVS score	1.2	1.1-1.3	0.001
Lactate	1.4	1.2-1.8	<0.001
ROMS	4	1.5-10.6	0.005
Bowel resection	2.5	1.2-5.4	0.01

Multivariate Analysis

- ROMS (OR 6.6) (95% CI 1.7-26.6)
- Increasing Lactate (OR 1.5) (95% CI 1.2-2.0)
- Higher SVS score (OR 1.2) (95% CI 1.01-1.3)

Nationwide Inpatient Sample Studies

Author / year	No. of Patents		Bowel resection		Mortality (%)		P-value
	Open	Endo	Open	Endo	Open	Endo	
Schermerhorn 2009	3380	1857	48%	28%	39%	16%	<0.001
			33%	14%	39%	25%	0.01
			46%	22%	33%	12%	0.02
			47%	26%	37%	16%	<0.01
ROMS		ROMS 251	30%	20%	28%	16%	<0.001

- Possibly due to Inability to exclude patients with sub-acute mesenteric ischemia ?
- Incidence of bowel resection lower following Endo Rx

Single-Center Retrospective Data

Author / year	No. of Patents		Bowel resect		Mortality (%)		P-value
	Open	Endo	Open	Endo	Open	Endo	
Arthurs 2011	14	56 Lap-69%	94%	84%	50%	36%	<0.05
Ryer (Mayo) 2011	49	17 Lap-71%	41%	71%	15%	23%	>0.05
Andraska 2022	120	28 Lap-26%					0.52
Rebelo 2022	27	17 Lap-41%	63%	18%	29%	30%	>0.05
Li 2024	37	21 Lap-35%	70%	35%	43%	19%	0.20
Vaddavalli (Mayo) 2024	127	31 Lap-32%	42%	23%	17%	23%	0.47

Endovascular revascularization vs open surgical revascularization as the first strategy for arterial acute mesenteric ischemia: A systematic review and meta-analysis

Yadong Shi, MD, Boxiang Zhao, MD, Yangyi Zhou, MD, Liang Chen, MD, Haobo Su, MD, *and* Jianping Gu, MD, *Nanjing, China*

J Vasc Surg 2024

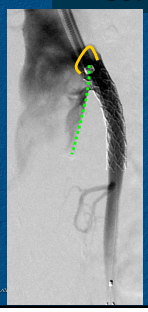
Conclusions: Compared with OSR, EVR as the first treatment for arterial AMI may not decrease short-term mortality or second-look laparotomy. Future multicenter randomized controlled trials are needed urgently to confirm these results. (J Vasc Surg 2024;■:1-11.)

Keywords: Acute mesenteric ischemia; Endovascular revascularization; Open surgical revascularization; Meta-analysis; Review

Covered Stent vs Bare Metal

Author / year	No. of Patents		Patency		P-value
	CS	BMS	CS	BMS	
Oderich 2013 (Mayo Clinic)	164	61	53%	28%	0.003
Zhou2019	93	20	83%	65%	0.17
Girault2021	86	-	76%	-	-
Alnahhal 2023 (Cleveland Clinic)	168	22	68%	75%	0.94

Covered Stent vs Bare Metal



- Adequacy of initial technical success
- Accuracy of stent placement
- Length of lesion
- Length of stent
- Caliber of delivery system

Covered versus bare-metal stenting of the mesenteric arteries in patients with chronic mesenteric ischaemia (CoBaGI): a multicentre, patient-blinded and investigator-blinded, randomised controlled trial

Lancet 2024

Luke G Terlouw, Louisa J D van Dijk*, Desirée van Noord, Olaf J Bakker, Diederik C Bijdevaate, Nicole S Erler, Bram Fioole, Jihan Harki, Daniel A F van den Heuvel, Jan Willem Hinnen, Jeroen J Kolkman, Suzan Nikkessen, André S van Petersen, Henk F M Smits, Hence J M Verhagen, Annemarie C de Vries, Jean-Paul P M de Vries, Dammis Vroegindeweij, Robert H Geelkerken, Marco J Bruno*, Adriaan Moelker*, on behalf of the Dutch Mesenteric Ischemia Study Group*

	CS	BMS	P-value
Number	47	47	
PP at 24 mths	81%	49%	< 0.001

Interpretation The findings of this trial support the use of covered stents for mesenteric artery stenting in patients with chronic mesenteric ischaemia.

Summary

- Greater use of endovascular techniques for emergency mesenteric revascularization in past two decades
  - Shorter ICU and hospital stay
  - Similar early mortality and MAE
- Outcomes were dependent on severity of ischemia and patient comorbidities, not mode of mesenteric revascularization
- Consider Covered Stent when technically feasible