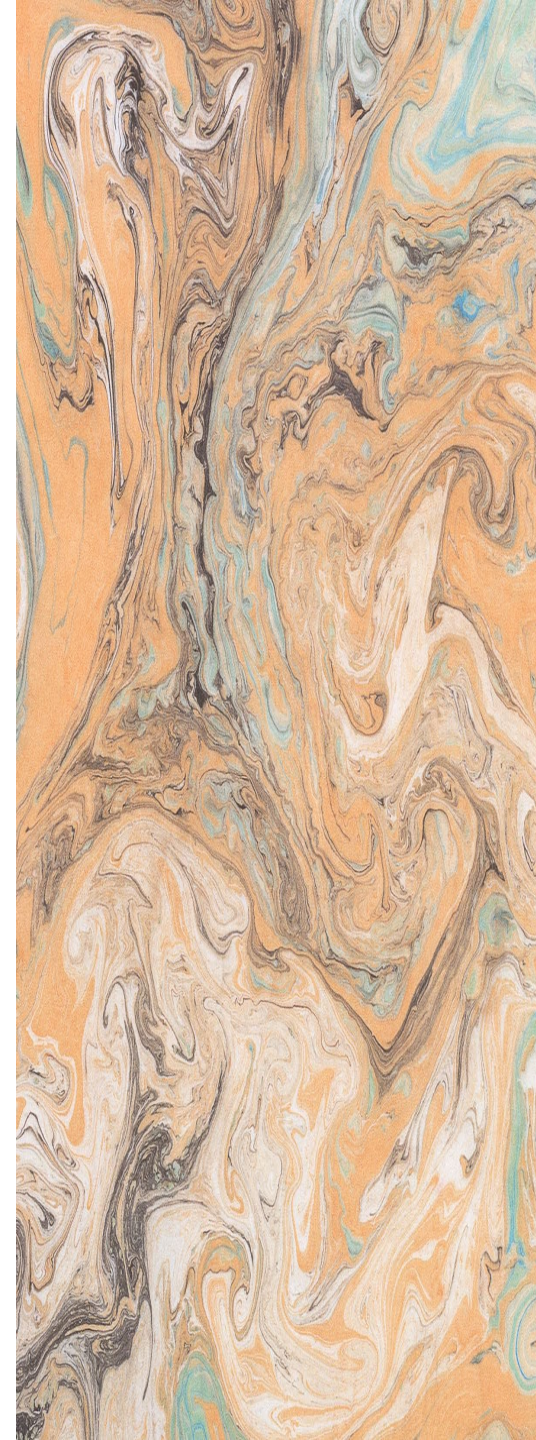

CHRONIC MESENTERIC ISCHEMIA IS BEST TREATED ENDOVASCULARLY

Farhad Udwadia – PGY3 (UBC)

Winnipeg Vascular & Endovascular Symposium, 2025



History of mesenteric revascularization

Robert Shaw
& EP Maynard
- 1958, MGH



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ORIGINAL ARTICLE | ARCHIVE



Acute and Chronic Thrombosis of the Mesenteric Arteries Associated with Malabsorption — A Report of Two Cases Successfully Treated by Thromboendarterectomy

Authors: R. S. Shaw, M.D., and E. P. Maynard, III, M.D. [Author Info & Affiliations](#)

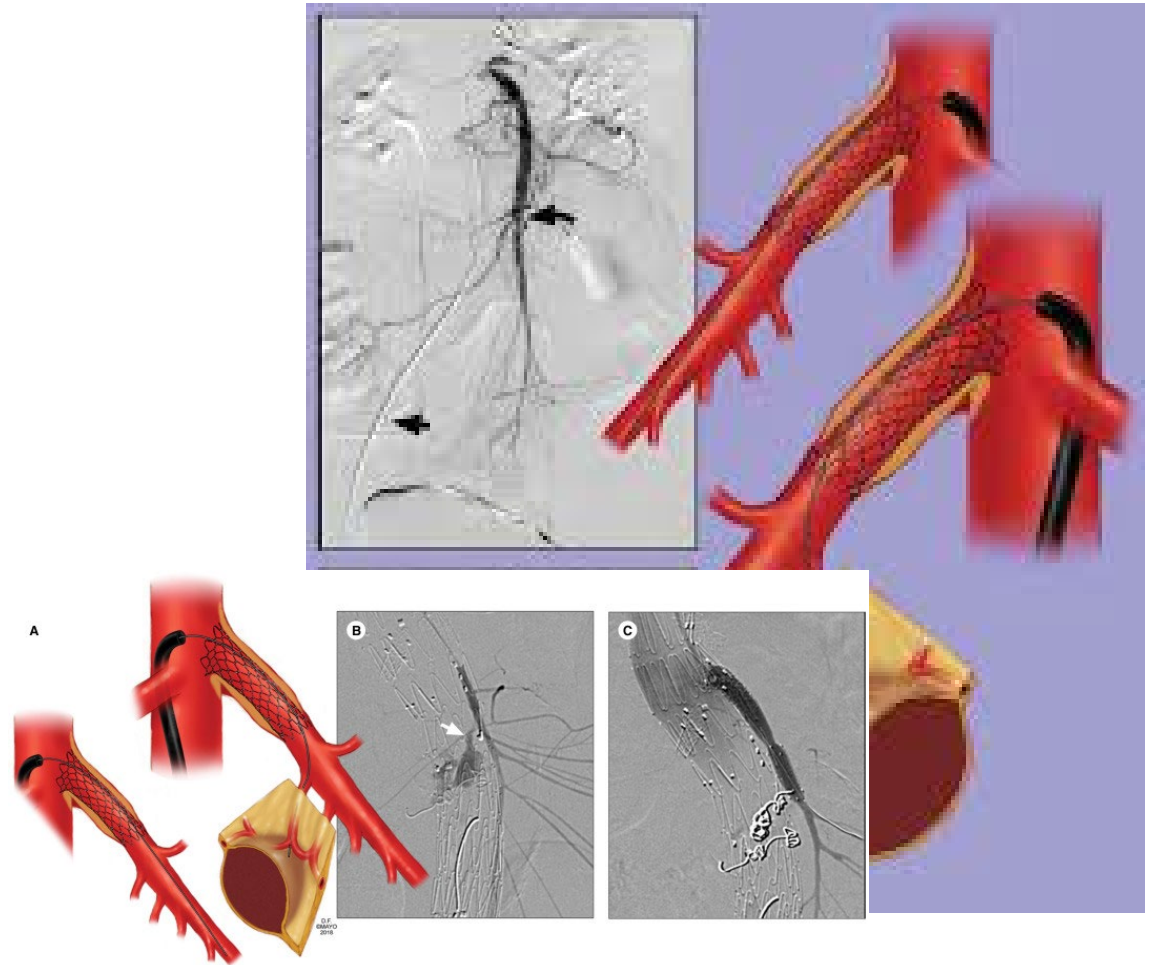
Published May 1, 1958 | N Engl J Med 1958;258:874-878 | DOI: 10.1056/NEJM195805012581803

VOL. 258 NO. 18

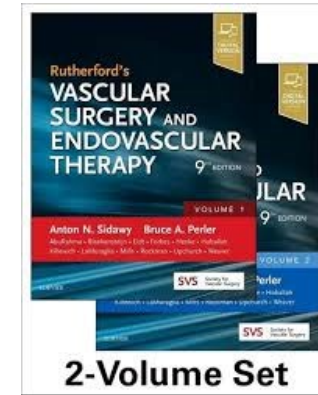
TO PUT THINGS IN PERSPECTIVE ...



A LOT HAS
CHANGED...
SURGERY IS NO
EXCEPTION!



WHAT MAKES SOMETHING “BEST TREATED”?



how can you define the "best" surgical treatment?

The **best** surgical treatment:

1. **Works best** – Solves the problem effectively.
2. **Is safest** – Minimizes risks and complications.
3. **Heals fast** – Ensures quick recovery.

What are goals of treatment for CMI?

1. Resolve abdominal symptoms
 2. Promote weight gain
 3. Prevents bowel infarction
-

ENDOVASCULAR INTERVENTION FOR CMI:

Safer:

- Lower mortality
- Faster return to baseline morbidity

Effective:

- Comparable patency /durability
 - Freedom from symptom recurrence
-

PERI-OPERATIVE MORTALITY



Mesenteric Revascularization: Management and Outcomes in the United States 1988–2006

[Marc L Schermerhorn](#), [Kristina A Giles](#), [Allen D Hamdan](#), [Mark C Wyers](#), [Frank B Pomposelli](#)

Large retrospective review comparing peri-operative mortality for open vs endo revascularization

National database - 6,342 PTA/S and 16,071 open surgical repairs

For CMI from 2000-2006:

- **Mortality was 3.7%** after PTA/S and 15% after open surgical repair (**$P < .001$**)
 - Results for open repair variable – low as 3-5% in some centers and high as 15-20% in some community centers
-

PERI-OPERATIVE MORTALITY



SYSTEMATIC REVIEW

A Systematic Review of Endovascular Repair Outcomes in Atherosclerotic Chronic Mesenteric Ischaemia

Petroula Nana ^{a,*}, Mark J.W. Koelemay ^b, Nicola Leone ^c, Alexandros Brodis ^d, Jos C. van den Berg ^e, Jorg L. de Bruin ^f, Robert H. Geelkerken ^g, Konstantinos Spanos ^a

Systematic review looking at outcomes for endovascular repair in CMI (2023):

- Looked at 16 retrospective studies (1,224 patients) reporting on 1,368 target vessels
- 30 day mortality rate was **2.0%** (95% CI 2 e 4%, p $\frac{1}{4}$.93, I² 36%)

MORBIDITY

REVIEW ARTICLE · Volume 67, Issue 5, P1598-1605, May 2018 · [Open Archive](#)

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A systematic review and meta-analysis of endovascular versus open surgical revascularization for chronic mesenteric ischemia

[Fares Alahdab, MD](#)^{a,b} · [Remy Arwani, MD](#)^c · [Ahmed Khurshid Pasha, MD](#)^d · ... · [Larry J. Prokop, MLP](#)^{a,e} · [Thomas S. Huber, MD](#)^f · [M. Hassan Murad, MD, MPH](#)^g [✉](#)^{a,b} [Show more](#)



Most recent, comprehensive meta-analysis comparing endo vs open for CMI patients

100 observational studies (18,726 patients)

Open surgery associated with a statistically significant increase for in-hospital complications (relative risk [RR], 2.2; 95% CI 1.8-2.6)

- Most commonly reported complications were access site hematomas and embolization for the endovascular approach vs bowel resection and infections for the surgical approach
-

MORBIDITY:

Journal of Endovascular Therapy

Outcomes of Endovascular and Open Treatment for Chronic Mesenteric Ischemia

[Jeffrey E. Indes, MD](#) ✉, [Jeannine K. Giacobelli, MD, MPH](#), [...], and [Alan Dardik, MD, PhD](#) (+2) [View all authors and affiliations](#)

[Volume 16, Issue 5](#) | <https://doi.org/10.1583/09-2797.1>

Large retrospective study of 666 patients: open (n=280) or endovascular (n=347)

ER associated with significantly lower rate of mesenteric ischemic complications compared to open repair (6.92% versus 17.1%; $p<0.0001$)

ER associated with significantly lower rates of cardiac, pulmonary, and infectious complications ($p<0.05$)

RECOVERY

Retrospective study looking at CMI patients (2008-2012) in Albany, NY

Found pts undergoing ER significantly less likely to be admitted to ICU and have a lengthy hospital stay

2016 · [Open Archive](#)

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Chronic mesenteric ischemia outcome analysis and predictors of endovascular failure

[Nikolaos Zacharias, MD](#) · [Sammy D. Eghbalieh, MD](#) · [Benjamin B. Chang, MD](#) · ... · [John B. Taggart, MD](#) · [Yaron Sternbach, MD](#) · [R. Clement Darling, III, MD](#)  [Show more](#)

	ER (n = 116)	OR (n = 45)	P
Primary patency at 3 years	89 (74)	41 (91)	.018
Survival at 3 years	110 (95)	35 (78)	.003
Hospital length of stay, days	5 ± 8	23 ± 20	<.001
Intensive care unit length of stay, days	2 ± 5	12 ± 19	<.001

RE-CAP:

Abundance of evidence that shows endovascular surgery is associated with significantly lower peri-operative mortality and morbidity

Many of these studies were done years ago, ER safer today

- Development of several lower profile platforms, mostly done via a 6Fr platform

Improved availability and familiarity with ancillary endovascular techniques

- Steerable sheaths, axillary/brachial access
-

PATENCY



Comparison of covered stents versus bare metal stents for treatment of chronic atherosclerotic mesenteric arterial disease

[Gustavo S. Oderich, MD](#) ^a · [Luke S. Erdoes, MD](#) ^b · [Christopher LeSar, MD](#) ^c · ... · [Stephen Cha, MS](#) ^a · [Audra A. Duncan, MD](#) ^a · [Thomas C. Bower, MD](#) ^a... [Show more](#)

Retrospective review of CS vs BMS (n=225)
CS had primary patency of 92% @ 3yrs (vs. 52% for BMS)

CS had secondary patency of 100% @3 years



CLINICAL RESEARCH STUDY | MESENTERIC ARTERY DISEASE · Volume 74, Issue 3, P902-909.E3, September 2021 · [Open Archive](#)

Midterm results after covered stenting of the superior mesenteric artery

[Antoine Girault, MD](#) ^{a,b} · [Quentin Pellenc, MD, MSc](#) ^{a,b} · [Arnaud Roussel, MD, MSc](#) ^{a,b} · ... · [Olivier Corcos, MD](#) ^{b,d} · [Iannis Ben Abdallah, MD](#) ^{a,b} · [Yves Castier, MD, PhD](#) ^{a,b}... [Show more](#)

At 2 years, the primary assisted patency and secondary patency rates were 95% (95% CI, 95% ± 8%) and 95% (95% CI, 95% ± 8%), respectively

PATENCY RATES OF COVERED STENTS

THE LANCET Gastroenterology & Hepatology

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

RCT comparing CS vs BMS (n=94)
CS had primary patency of 90% @1 year
and 81% @ 2 yrs (vs. 49% for BMS)

CS show excellent primary patency rates, assisted primary and secondary patency even better!

SX RESOLUTION AND REINTERVENTION



Comparison of covered stents versus bare metal stents for treatment of chronic atherosclerotic mesenteric arterial disease

[Gustavo S. Oderich, MD](#) ^a · [Luke S. Erdoes, MD](#) ^b · [Christopher LeSar, MD](#) ^c · ... · [Stephen Cha, MS](#) ^a · [Audra A. Duncan, MD](#) ^a · [Thomas C. Bower, MD](#) ^a... [Show more](#)

Outcomes of Endovascular Treatments for In-Stent Restenosis in Patients With Mesenteric Atherosclerotic Disease

[Yi Zhou, MD](#) · [Evan J. Ryer, MD](#) · [Robert P. Garvin, MD](#) · ... · [Anh Pham, MD](#) · [Jeremy Irvan, MD](#) · [James R. Elmore, MD](#)

CS had freedom from restenosis ($92\% \pm 6\%$ vs $53\% \pm 4\%$; $P = .003$), symptom recurrence ($92 \pm 4\%$ vs $50 \pm 5\%$; $P = .003$), reintervention ($91\% \pm 6\%$ vs $56\% \pm 5\%$; $P = .005$) at 3 years

At 2 years, out of 91 patients, 29% were treated for mesenteric artery in-stent restenosis with PTA (44%) or stenting (56%)

- 0% mortality rate

SX RESOLUTION AND REINTERVENTION

Chronic mesenteric ischaemia: 28-year experience of endovascular treatment

Vascular-Interventional | Published: 03 February 2012

Ulku Cenk Turba ✉, Wael E. Saad, Bulent Arslan, Saher S. Sabri, Stacey Trotter, John F. Angle, Klaus D.

Hagspiel, John A. Kern, Kenneth J. Cherry & Alan H. Matsumoto

Immediate clinical improvement or resolutions of symptoms was seen in 88.2% (146/166)

28/146 (19.2%) had recurrence of symptoms at a mean follow-up of 21.9 months

Of these, 75% (21/28) of the patients underwent repeat endovascular therapy with long-term improvement, 3/28 (10.7%) underwent surgical revascularisation, 2/28 (7.1%) were found to have a malignancy as the cause of pain on follow-up, and 2/28 (7.1%) refused tx. Therefore, at long-term follow-up, 139 of 146 patients (95.2%) experienced assisted clinical success

TAKEAWAYS:

CS show excellent primary and secondary patency (>90%), rivaling that of open surgery



Historically BMS have been associated with high rates of restenosis (20-66%), however CS do markedly better

As endo skills/tools continue to improve, there are fewer “unsuitable” lesions!

“UNSUITABLE” LESIONS

Clinical Study

Recanalization of Chronic Total Occlusions of the Superior Mesenteric Artery in Patients with Chronic Mesenteric Ischemia: Technical and Clinical Outcomes

Christopher J. Grilli DO, Charles R. Fedele DO, Osman M. Tahir DO, Clinton W. Wrigley MD, Mark J. Garcia MD, MS, George Kimbiris MD, Demetrios J. Agriantonis MD, Daniel A. Leung MD  

Department of Interventional Radiology, Christiana Care Health System, 4755 Ogletown-Stanton Road, Newark, DE 19718

Reviewed ~50 SMA CTOs that were stented for CMI

- Technical success 87%
- 100% symptomatic improvement
- 88% Secondary freedom from symptomatic recurrence rate
- 7% minor access-related complications, no major

