WVES | Winnipeg Vascular & Endovascular Symposium

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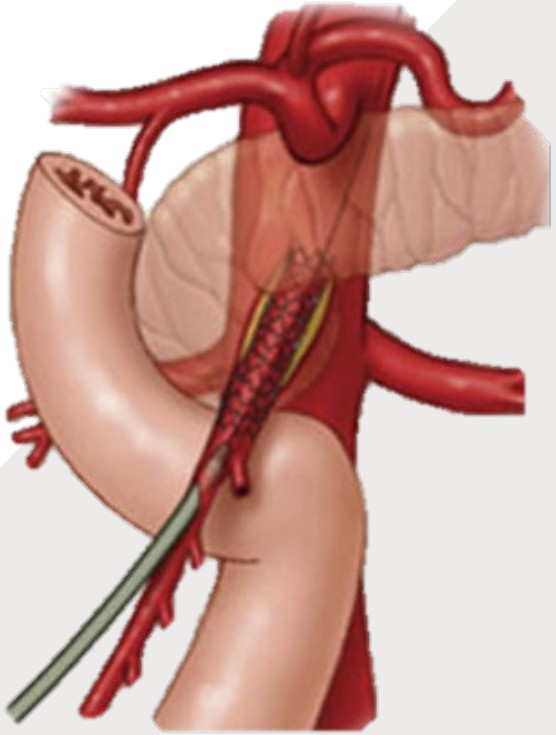


Retrograde Open Mesenteric Stenting
- How I do it -

Pascal Rhéaume
Ville de Québec

Université Laval
Faculté de médecine

- No disclosure

Diagnosis

Diagnostic

Classique

« The diagnosis is impossible, the prognosis hopeless and the treatment useless»

Cokkinis - 1926

Actuel

« The diagnosis is possible, the prognosis hopeful and the treatment useful and effective»

JFI - 2022

Journées de formation interdisciplinaire

Epidemiology

Épidémiologie

Classique

- Rare, Moins des 0,1% des admissions
- Prédominance féminine (3:1)
- Patients âgés 60-80ans
- Plusieurs comorbidités de base

Actuel

- Augmentation en fréquence
- H = F
- Patients de plus en plus agés
- Comorbidités croissantes

Journées de formation interdisciplinaire

Introduction

Causes

Embolie Artérielle

Classique

- Cause la plus fréquente : 40-50%
- Présentation aigue
- 1/3 ont embolisation à d'autres sites
- AMS fréquence du à angulation favorable
- Épargne jéjunale proximale
- La plupart d'origine cardiaque

Actuel

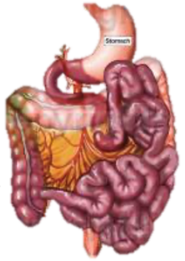
- Seconde cause en fréquence dans séries contemporaines
- Présentation plus frustre possible si embolisation distale

Journées de formation interdisciplinaire

Thrombose Artérielle

Classique

- Deuxième cause en fréquence: 25-30%
- Présentation plus subtile bien qu'aigue
- Occlusion à l'origine de l'AMS
- Territoire ischémique plus étendu
  - Pas d'épargne jéjunale ni de la colique moyenne



Actuel

- Maintenant première cause d'ischémie aigue
- Présentation peut être très aigue dans situation pro-coagulante (néoplasie, hypercoagulabilité, etc)
- Maladie athérosclérotique non ostiale

Journées de formation interdisciplinaire

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Causes

Thrombose Artérielle

Classique

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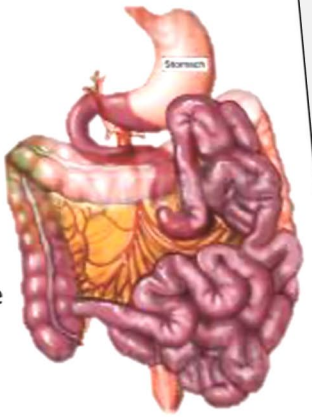

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First Case

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Superior Mesenteric Artery Angioplasty and Stenting via a Retrograde Approach in a Patient with Bowel Ischemia

A Case Report

Ross Milner, MD,* Edward Y. Woo, MD,† and Jeffrey P. Carpenter, MD,†
Atlanta, GA and Philadelphia, PA

Acute mesenteric ischemia continues to be a highly morbid diagnosis with a high mortality rate. Percutaneous management of mesenteric ischemia is being more widely applied. Its utility is limited, though, for patients who present with an acute abdomen from ischemic bowel. The authors report a novel combination of open and endovascular techniques via a retrograde superior mesenteric artery (SMA) approach to treat acute mesenteric ischemia in the setting of an acute abdomen.

Vascular and Endovascular Surgery *Volume 38, Number 1, 2004*

CASE

Case Presentation

Clinical Presentation

- 73 yo female patient

- PMH:
  - HTN – DLP
  - CAD – NSTEMI 2009 – PTCA
  - Metastatic Breast Cancer – oral chemo

  - PAD
    - Severe atherocslerotic disease
    - Stent angioplasties of both common iliac arteries

Case Presentation

Clinical Presentation

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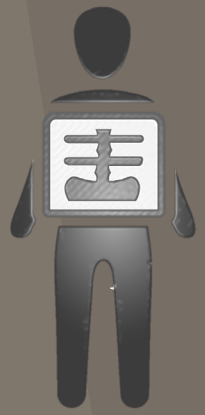
- **Presentation**

  - 2 days prior to an outside hospital with mild abdominal pain
  - Returned home

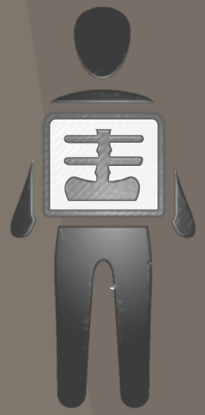
  - Came back to ER for constant and more intense pain
  - WBC: 2.5
  - Lactate 3.9
  - Signs of peritonitis on physical exam

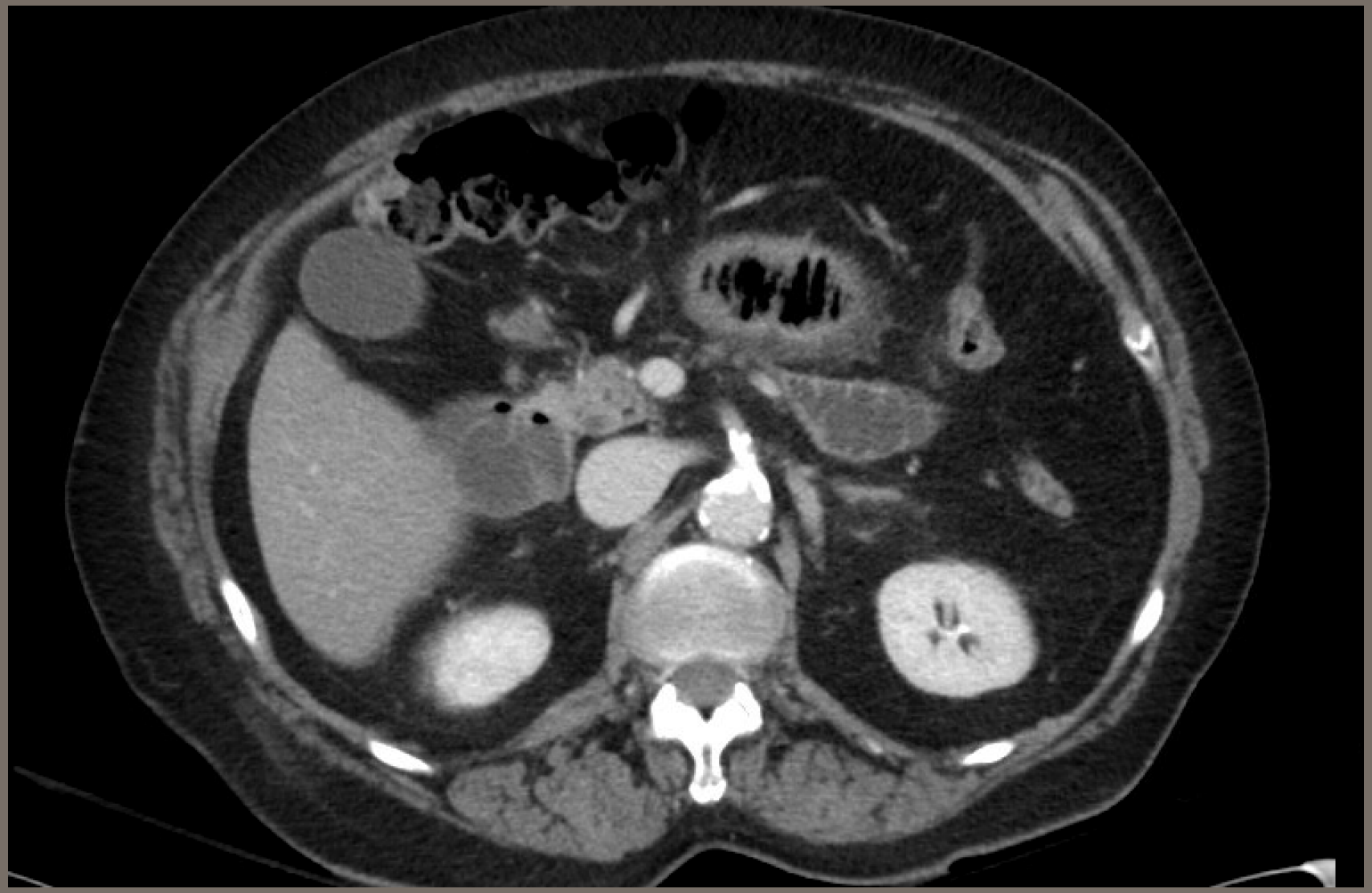
Imaging



Case Presentation

Imaging





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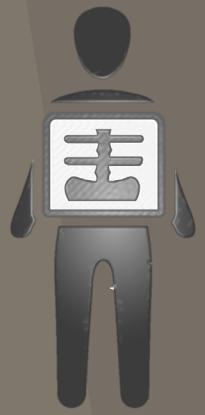

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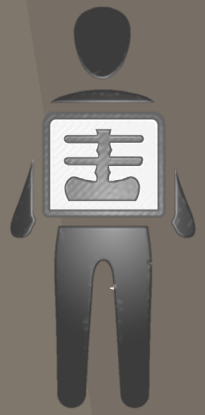

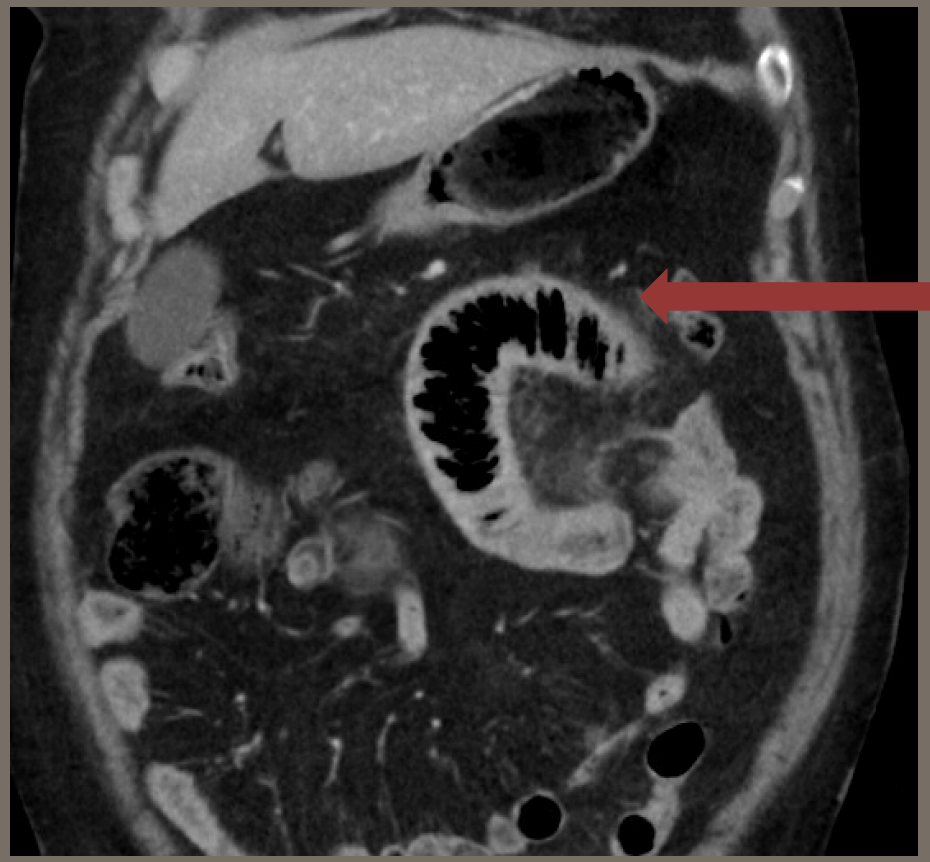

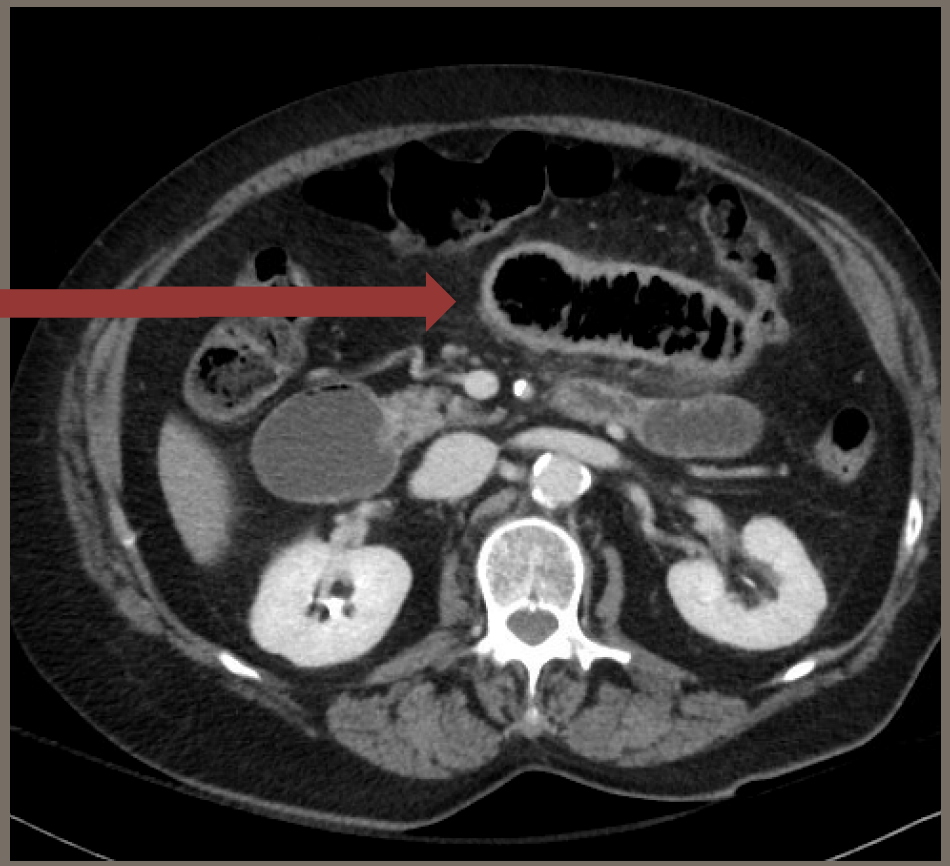

Case Presentation

Decision

- Taking into account:
  - Immunocompromised status
  - Atherosclerotic burden
    - Infrarenal aorta
    - Supracoeliac aorta
    - Stents in both common iliacs
    - Diseased external iliacs
  - Signs of peritonitis
  - Moderately comorbid patient
  - Her will to treat any potential reversible cause

Case Presentation

Decision

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- Open laparotomy
  - Short (25cm) ischemic segment of bowel
  - No perforation
  - No transmural ischemia
- Mesenteric revascularisation
  - **ROMS**

TECHNIQUE

Preparation

General Principles

- Positionning
  - Hybrid room
- Laparotomy
  - Midline
  - Assess bowel viability
  - Control any gross contamination

Preparation

Technical Pearl

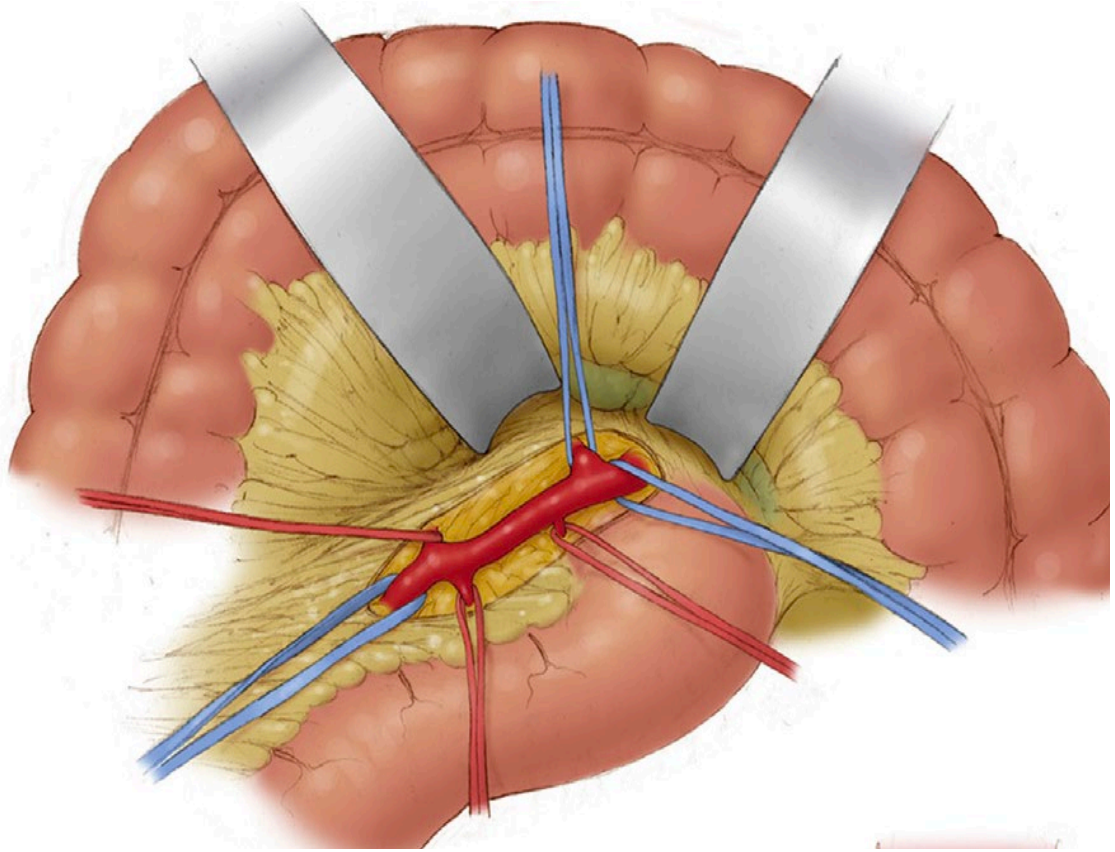
- Positionning
  - Move the C-arm prior
  - Make sure that the abdomen can be imaged
  - Some recommend having the left upper extremity prepared in the surgical field in anticipation of possible brachial access

Angiogram and Thrombectomy

Exposure

General Principles

- Exposure of SMA
  - Retract transverse colon cephalad
  - Base of the transverse colon
  - Aim for calcifications



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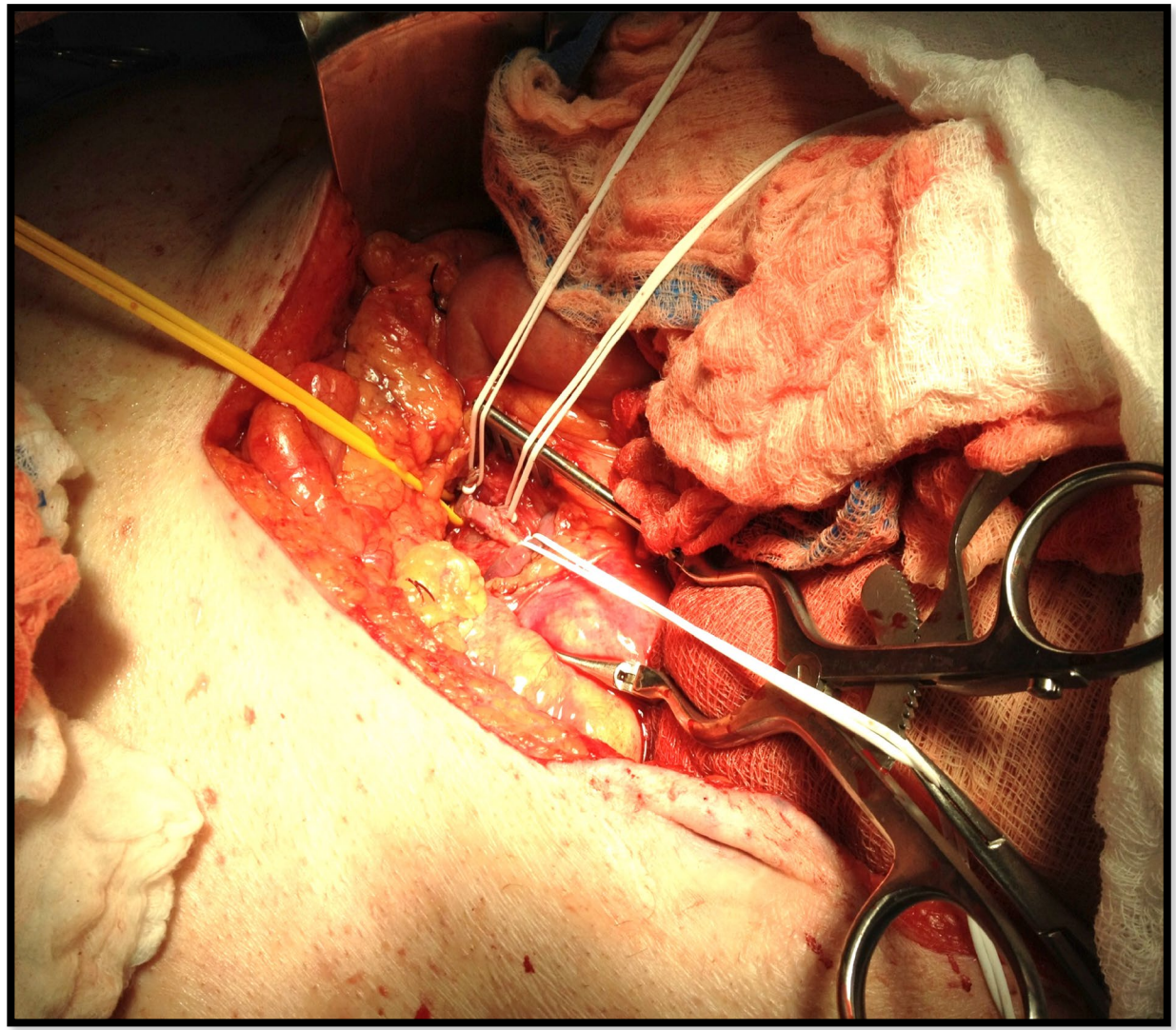


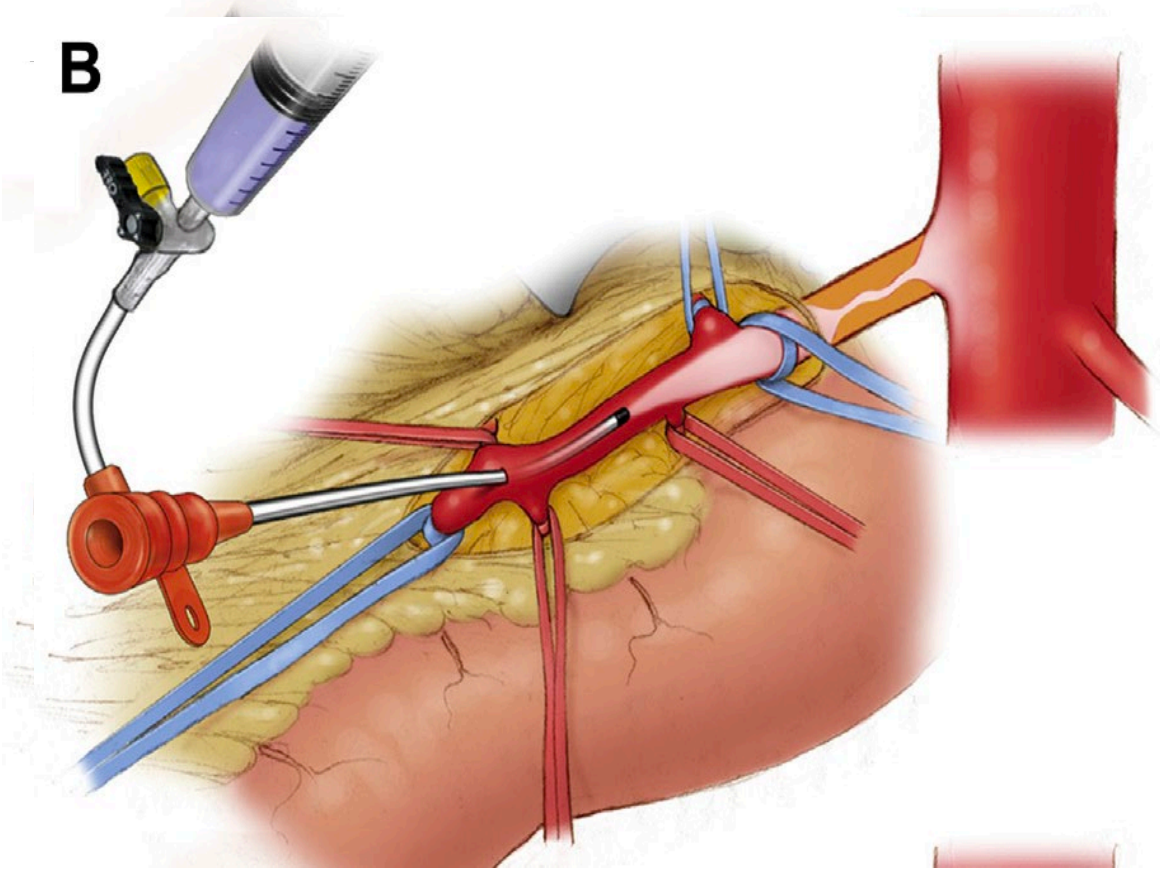
Technical Pearl

- No Pulsatility
  - Mobilise 3rd 4th portion of duodenum
  - Doppler
  - Ultrasound

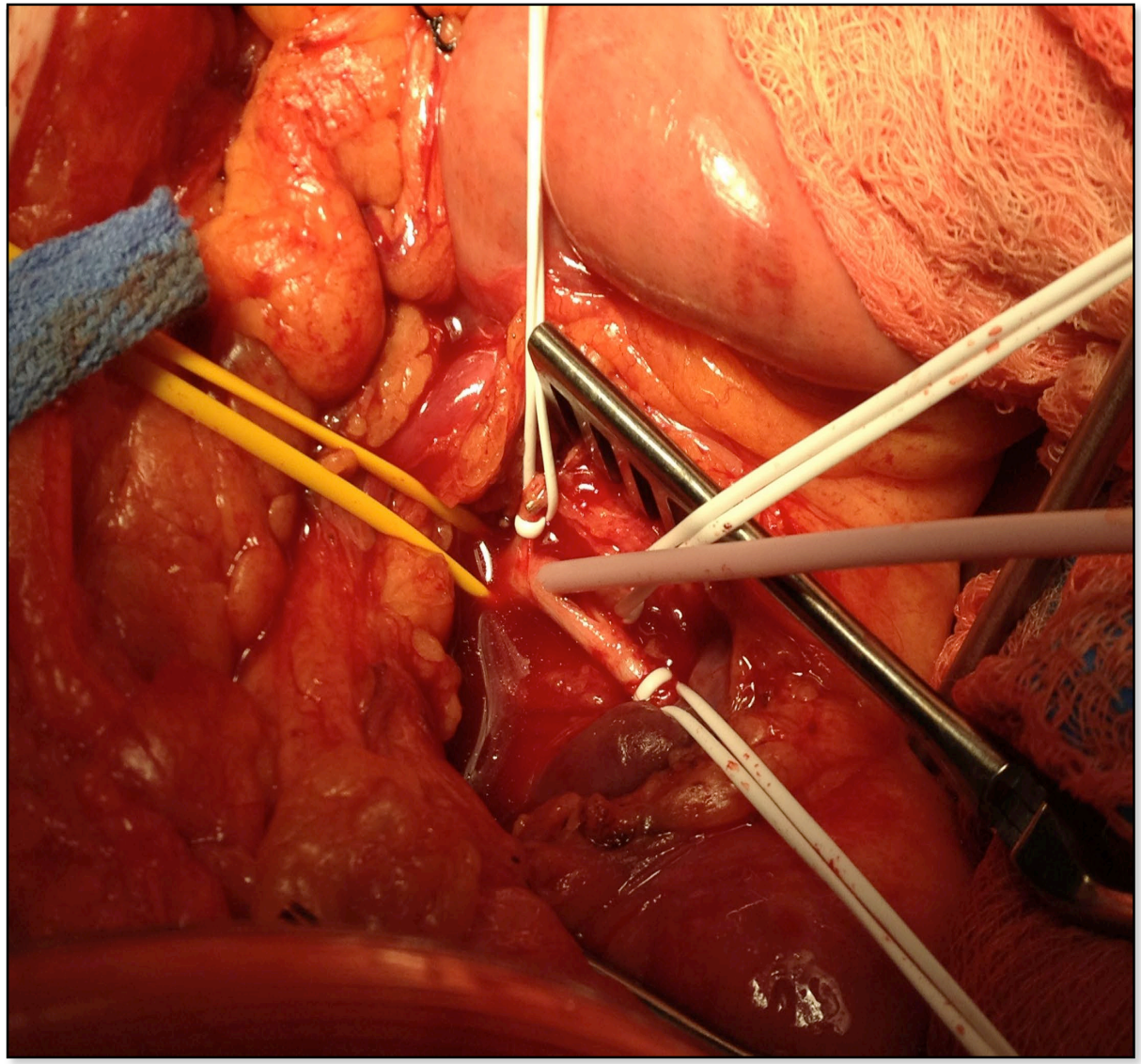
Angiogram and Thrombectomy

General Principles

- Puncture site
  - Area of less calcifications
- Angiogram
  - Find proper angulation
  - Avoid retractors



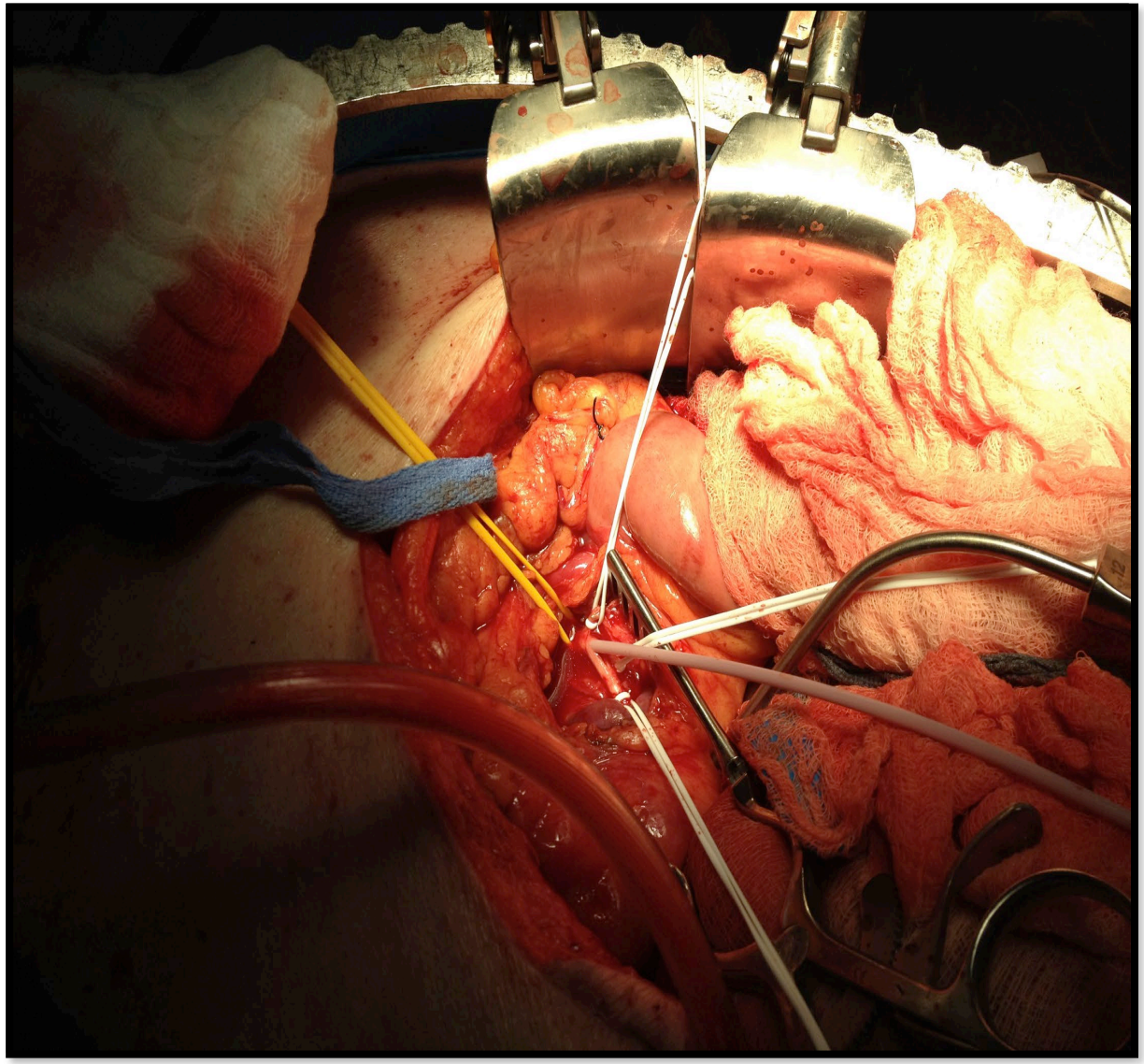
Angiogram and Thrombectomy



Technical Pearls

- Puncture site
  - Prior to SMA incision and endarterectomy
  - Heparinisation
- Angiogram
  - 7 Fr Sheath - Bright tip
  - Long sheath to avoid radiation exposure
  - 60-90^{o} LAO

Angiogram and Thrombectomy



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- Angiogram
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  - 60-90º LAO

Angiogram and Thrombectomy

General Principles

- Puncture site
  - Area of less calcifications
  - Bypass vs Reimplantation
- Angiogram
  - Find proper angulation
  - Avoid retractors

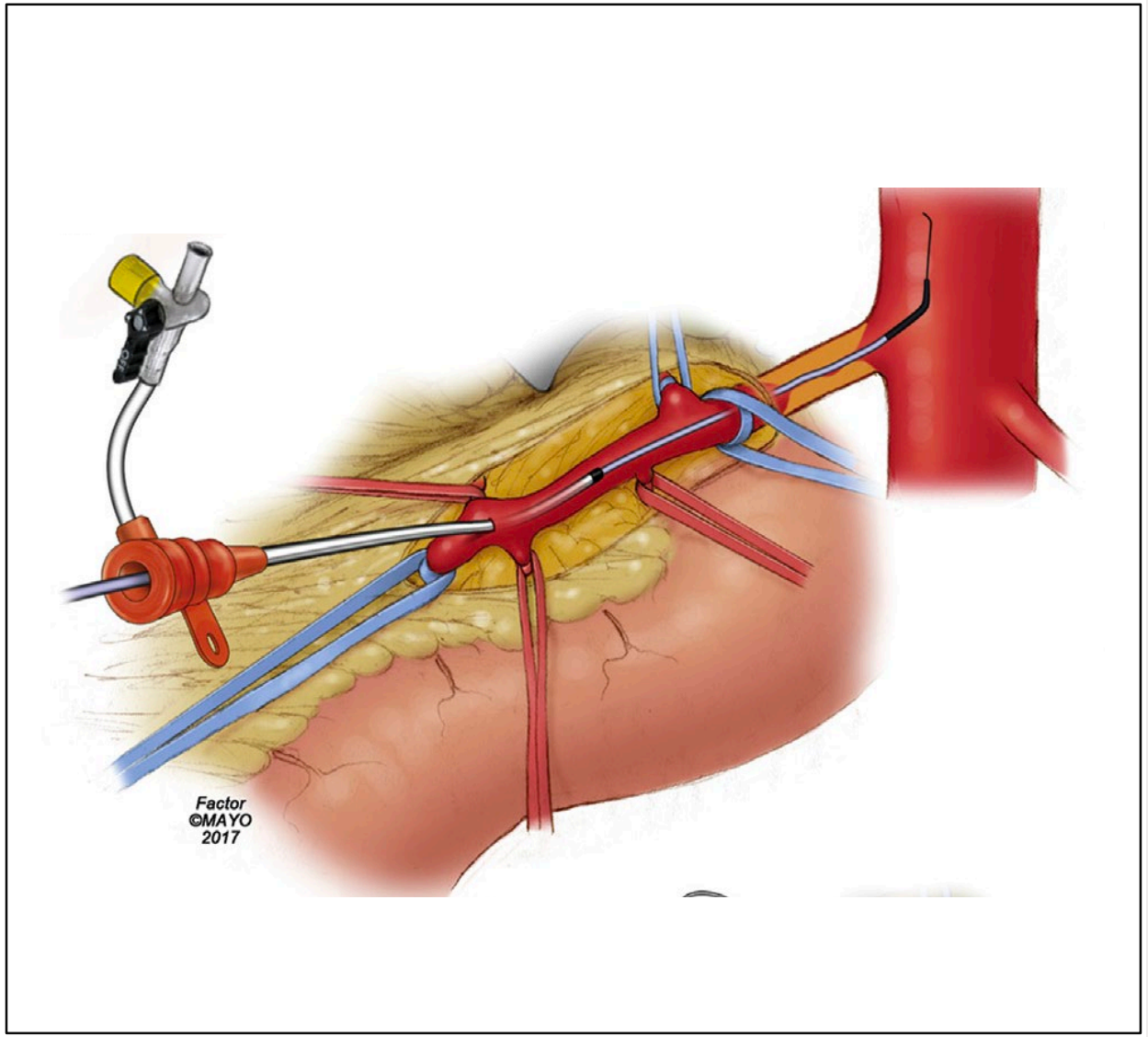
Technical Pearls

- Puncture site
  - Prior to SMA incision and endarterectomy
  - Heparinisation
- Angiogram
  - 7 Fr Sheath - Bright tip
  - Long sheath to avoid radiation exposure
  - 60-90^{o} LAO

Stent Angioplasty

General Principles

- Traverse the lesion
  - Pushability
- Thrombectomy
  - Over the wire



Stent Angioplasty

General Principles

- Traverse the lesion
  - Pushability
- Thrombectomy
  - Over the wire

Technical Pearls

- Traverse the lesion
  - Combination of wire (Glide)
  - 0.018 or 0.014 plateform
  - Translesionary passage to avoid aortic dissection
  - Confirm wire in the aorta
- Thrombectomy
  - Allows you to see the stenosis
  - Contrast into the balloon

Stent Angioplasty

General Principles

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Angiogram

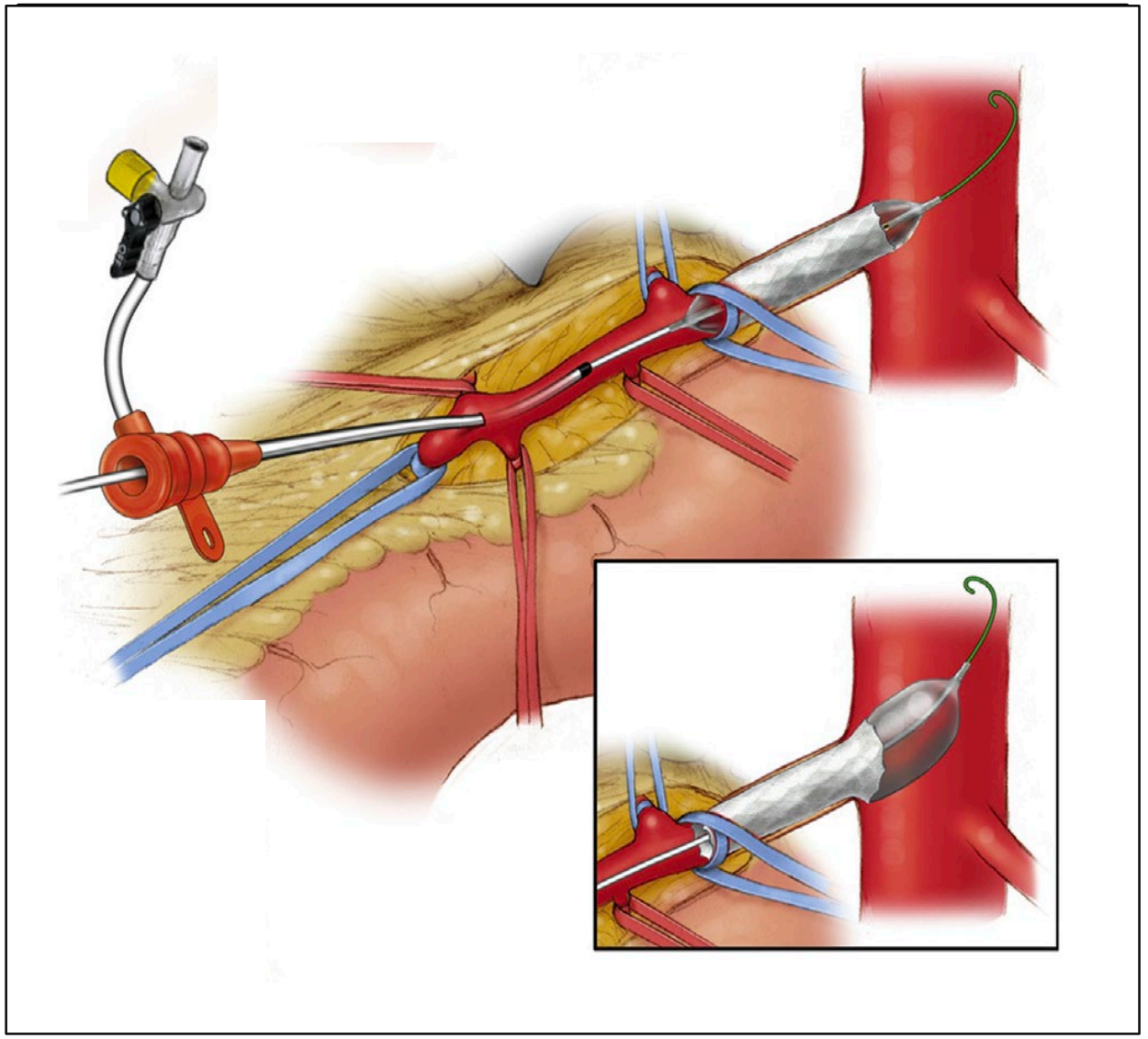
Technical Pearls

- Angiogram
  - Find proper angulation (90°)
  - Markers

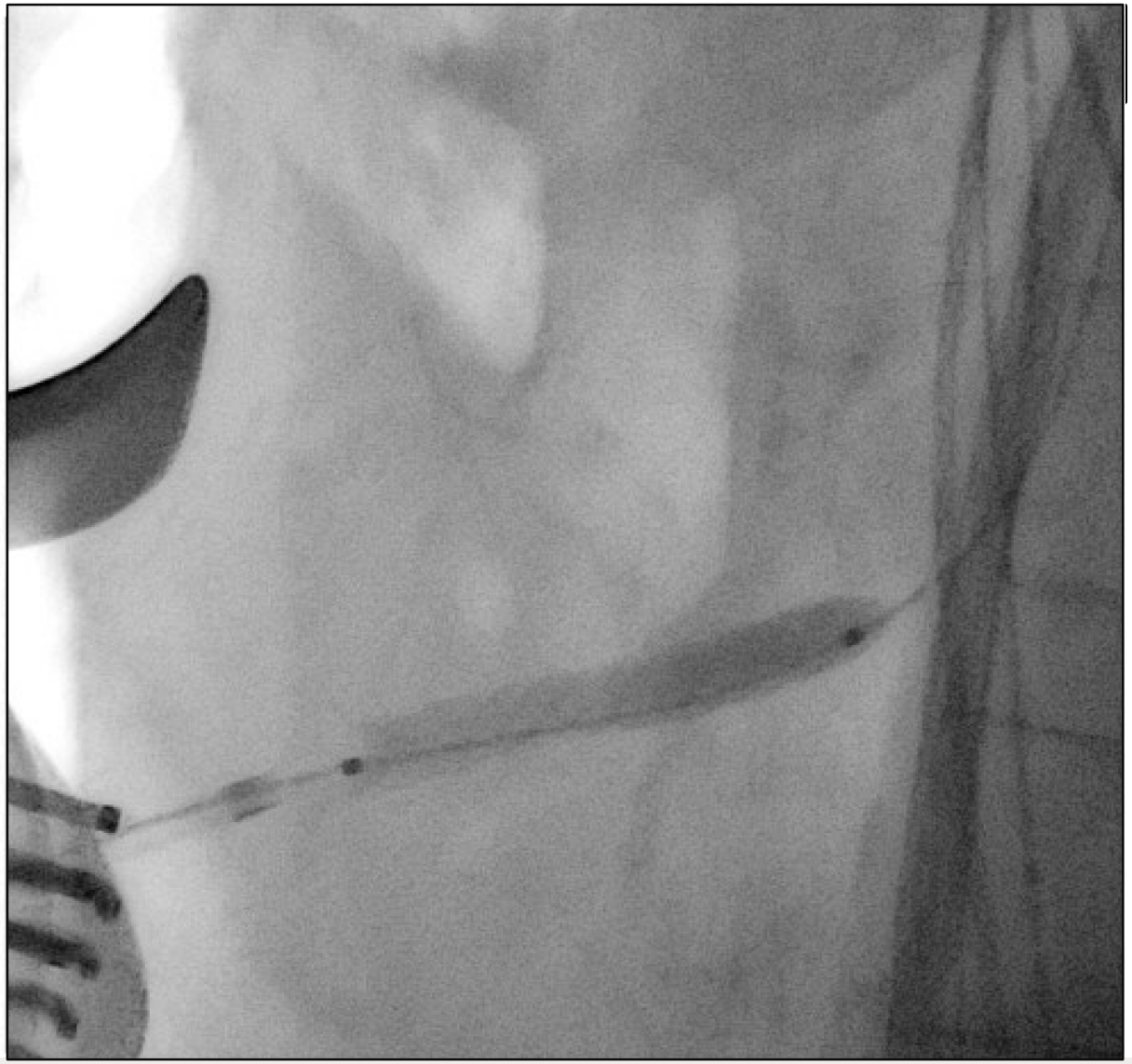
Stent Angioplasty

General Principles

- Stent Angioplasty
  - Predilatation
  - Stent deployment
- Completion angiography



Stent Angioplasty



Technical Pearls

- Stent Angioplasty
  - Control arterial branches
  - Predilatation
  - Advance sheath into the aorta
  - Covered vs uncovered (contamination)
  - 2-5mm into the aorta
  - Flosh technique for precise deployment
    - Femoral vs brachial
  - Post dilate with a large balloon if need be
  - Preserve collaterals, especially the middle colic artery and proximal jejunal branches.

Stent Angioplasty

General Principles

- Stent Angioplasty
  - Predilatation
  - Stent deployment
- Completion angiography

Technical Pearls

- Completion angiography

Stent Angioplasty

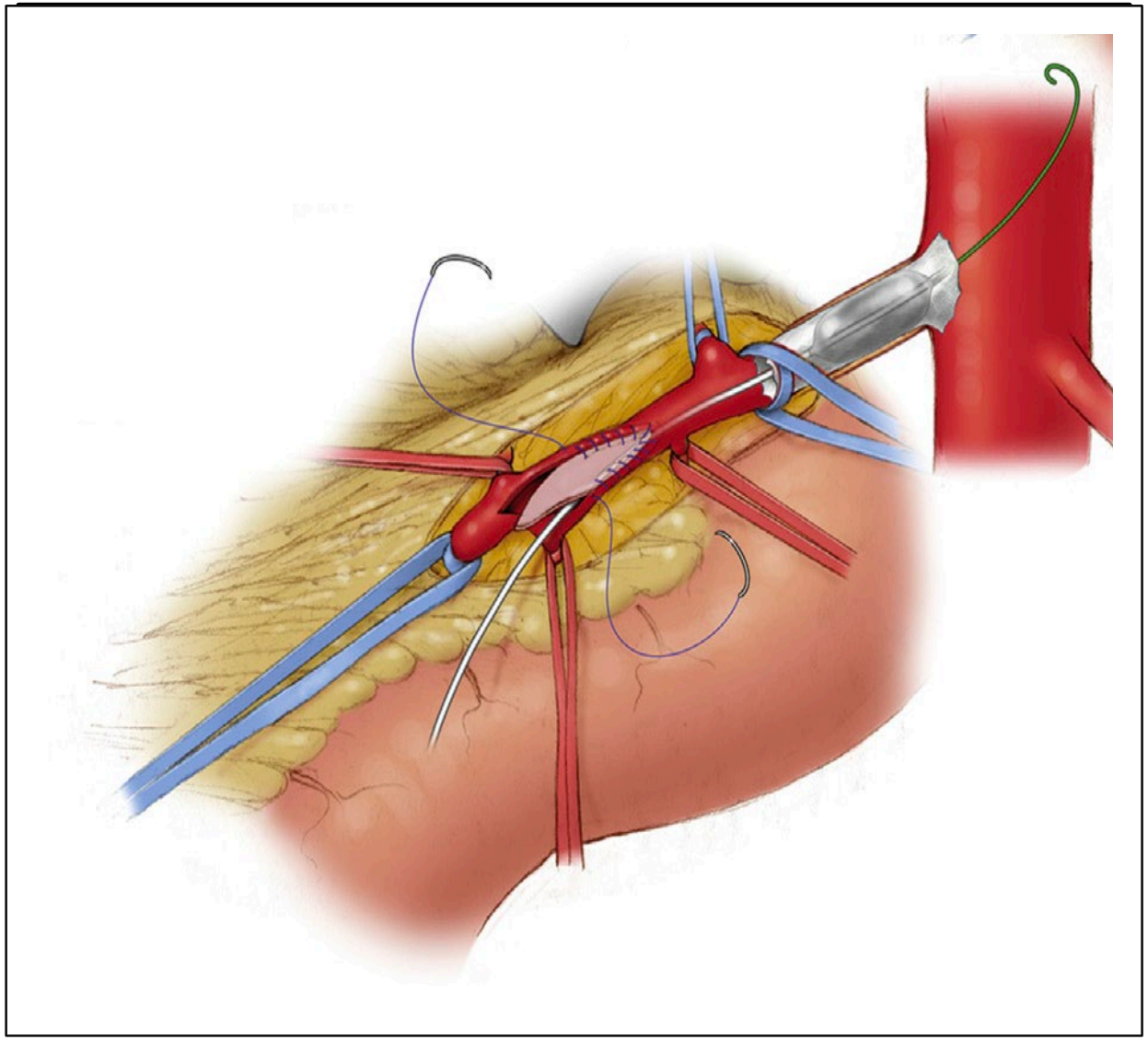
Technical Pearls

- Completion angiography

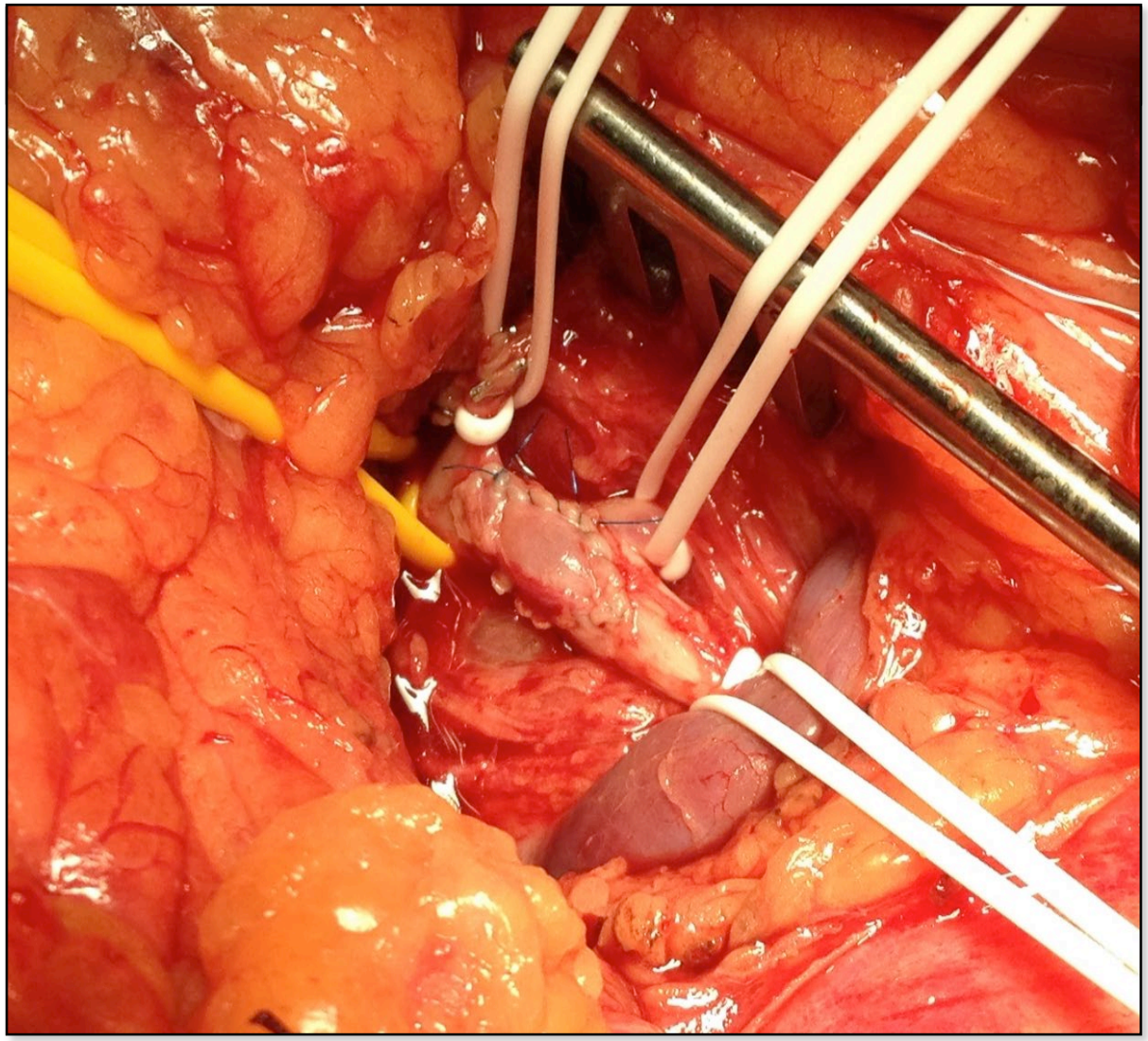
Arterial Closure

General Principles

- Arterial Control
  - Vessel loop or clamp
- Arterial opening
  - Transverse vs longitudinal
  - Patch



Arterial Closure

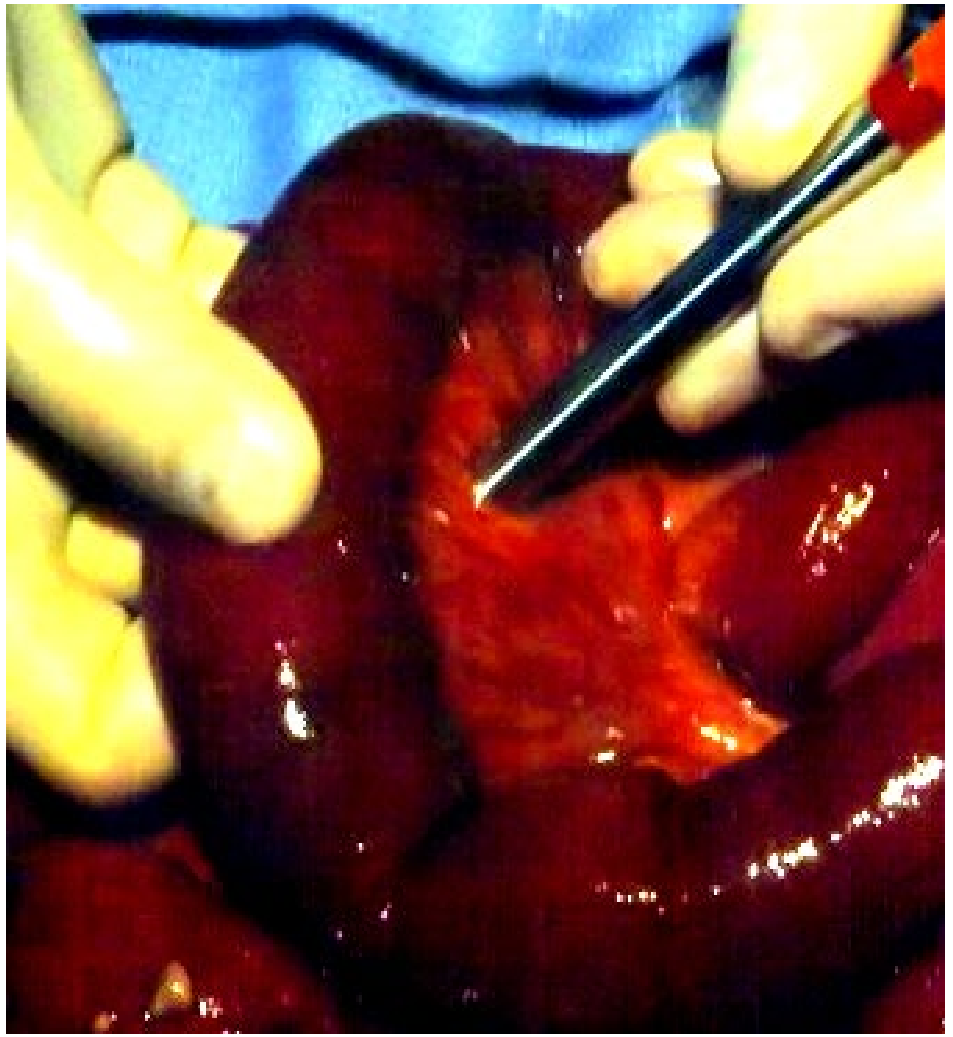


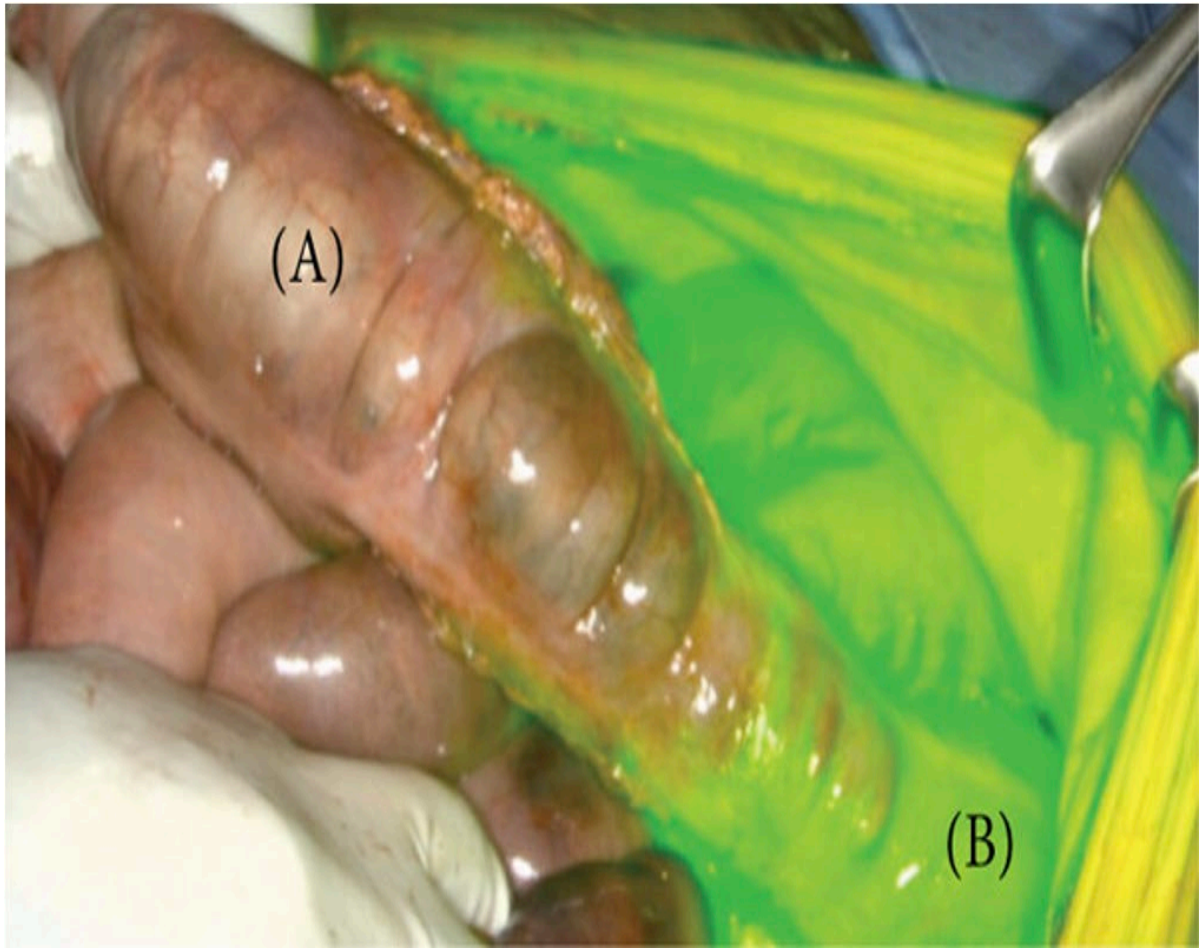
Technical Pearls

- Arterial Control
  - Ballon into the stent
- Arterial opening
  - Vein or bovine pericardial

General Principles

- Reassess for bowel viability
- Resection
  - Second look…
  - Reanastomosis…





Technical Pearls

- Indocyanide Green

Home › Techniques in Coloproctology › Article

Fluorescence angiography with indocyanine green for low anterior resection in patients with rectal cancer: a prospective before and after study

Original Article | Published: 14 January 2025

Volume 29, article number 45, (2025) Cite this article

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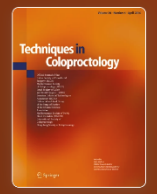


Techniques in Coloproctology

Aims and scope →

Submit manuscript →

J. Charbonneau, É. Papillon-Dion, R. Brière, N. Singbo, A. Legault-Dupuis, S. Drolet, F. Rouleau-Fournier, P. Bouchard, A. Bouchard, C. Thibault & F. Letarte

Use our pre-submission checklist →

Avoid common mistakes on your manuscript.

To remember…

- **Communicate** with other surgical teams (general surgery, nursing and anesthesia team)
- **Positioning** of the patient to make sure that the abdomen can be imaged with fluoroscopy.
- Having the **left upper extremity prepared** in the surgical field for possible brachial access
- Use a **longer sheath** with radiopaque marker (45 cm) to minimze radiation exposure and visualize the tip
- **Balloon-expandable stent** is preferred because of its precise deployment and greater radial force.
- **Covered stents** may offer advantage in terms of patency,
- Avoid covered stents n the setting of **peritoneal contamination**.
- Low threshold for inspection of the arterial lumen **through longitudinal arteriotomy** for any residual thrombus. In these cases, the arteriotomy is closed using patch angioplasty.

VARIATIONS

Variations

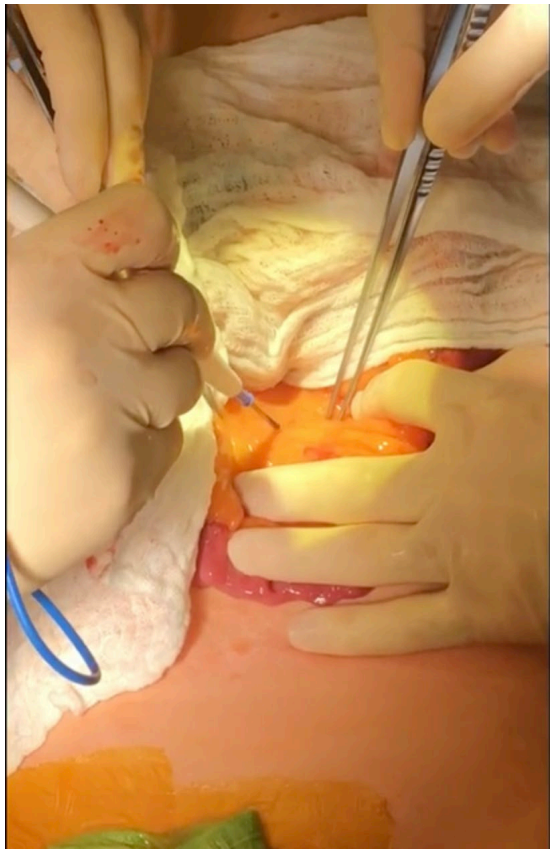
Jejunal

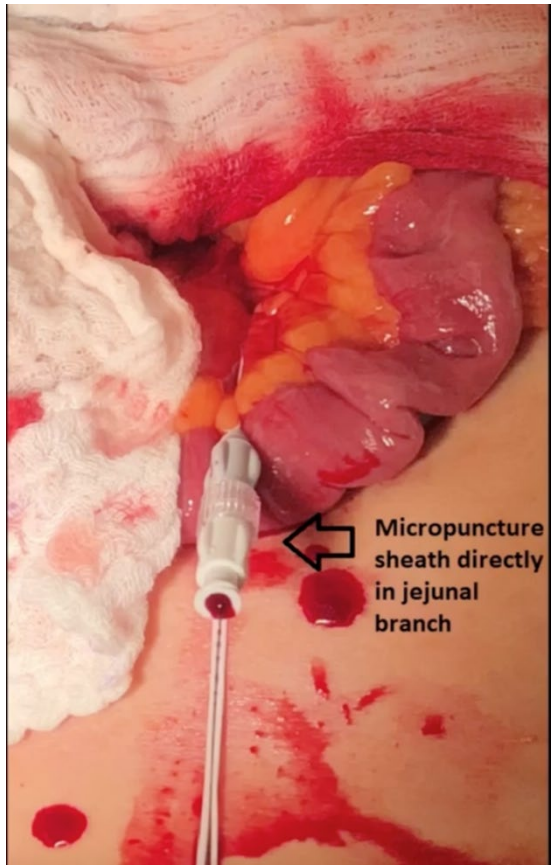
From the Society for Vascular Surgery

Journal of Vascular Surgery
June 2023

Retrograde superior mesenteric artery stenting via jejunal arterial access—how I do it

Kofi B. Quaye, MD,[a] Zachary F. Williams, MD,[a] *and* Mitchell W. Cox, MD,[b] *Durham, NC; and Galveston, TX*





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Variations

Jejunal

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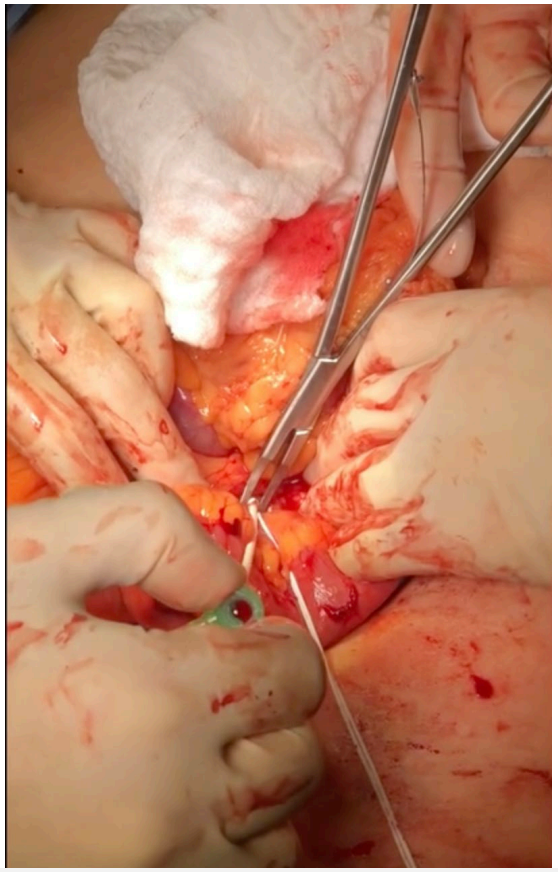
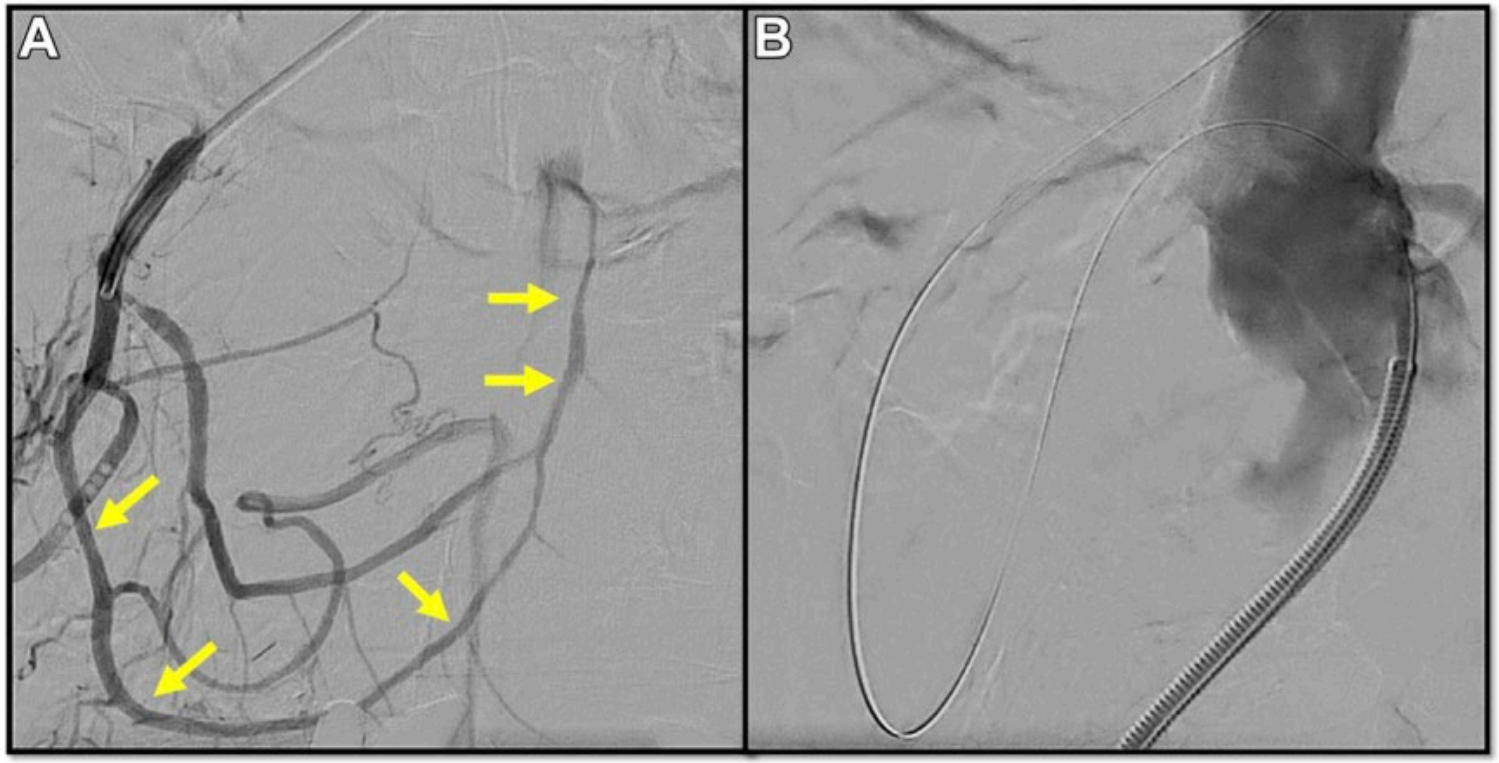


Transcollateral

Transcollateral retrograde recanalization of superior mesenteric artery occlusion through the pancreaticoduodenal arcade

Khaled El-Qawaqzeh, MD, Romeo Mateo, MD, Heepeel Chang, MD, Arun Goyal, MD, Sateesh Babu, MD, *and* Daniel J. Ventarola, MD, *Valhalla, NY*



Journal of Vascular Surgery Cases, Innovations and Techniques
April 2025

Variations

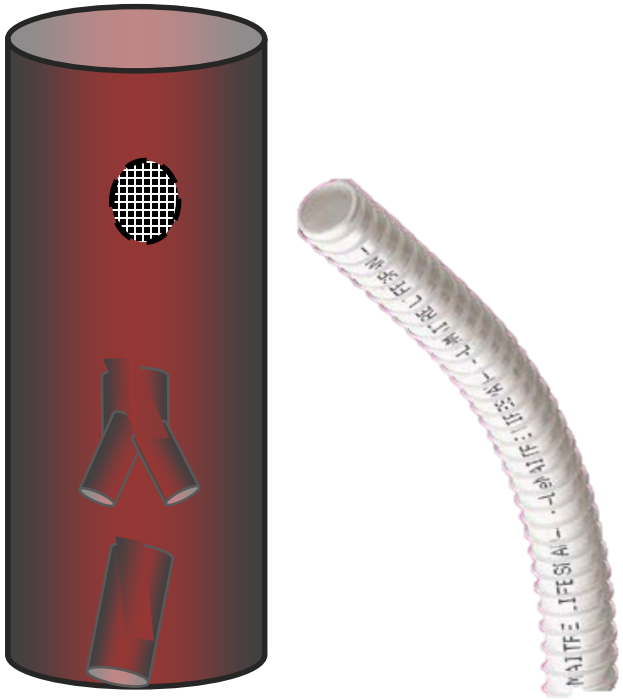
Clampless Anastomosis

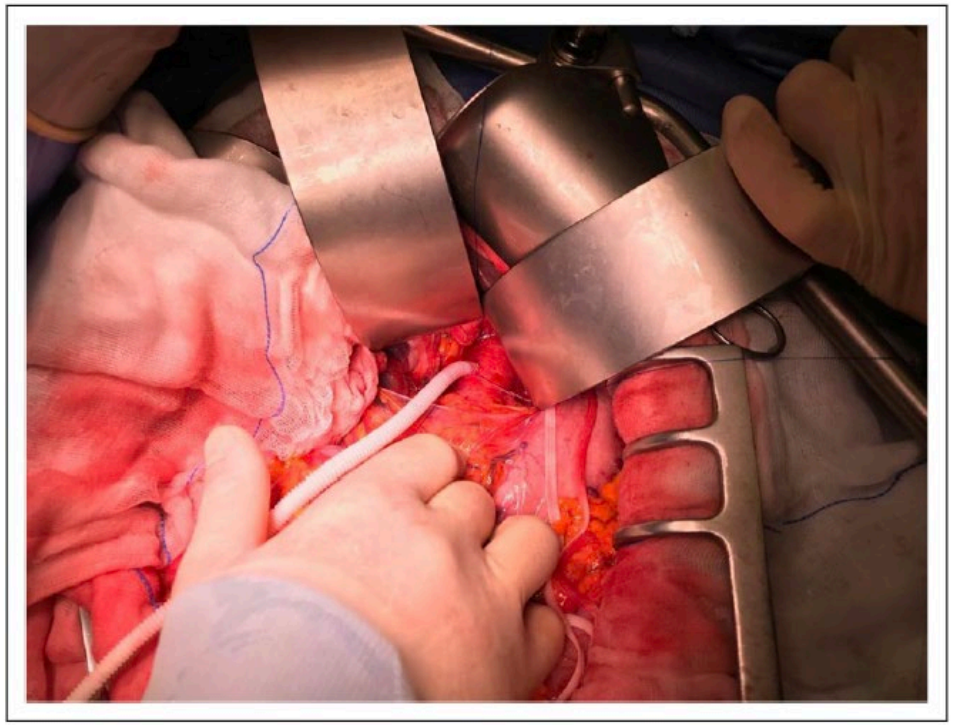
Vascular and Endovascular Surgery
2024, Vol. 58(4) 419–425

DOI: 10.1177/15385744231215566
journals.sagepub.com/home/ves
Sage

Hybrid Clampless Anastomosis in Antegrade Aorto-Superior Mesenteric Artery Bypass

Elisabetta Tanda, MD[1], Sara Zappadu, MD[1], Gabriele De Donno, MD[1], Salvatora Dettori, MD[1], Sandro Ciccarello, MD[1], Franco Piredda, MD[1], and Gian Franco Fadda, MD[1]





Clampless Anastomosis

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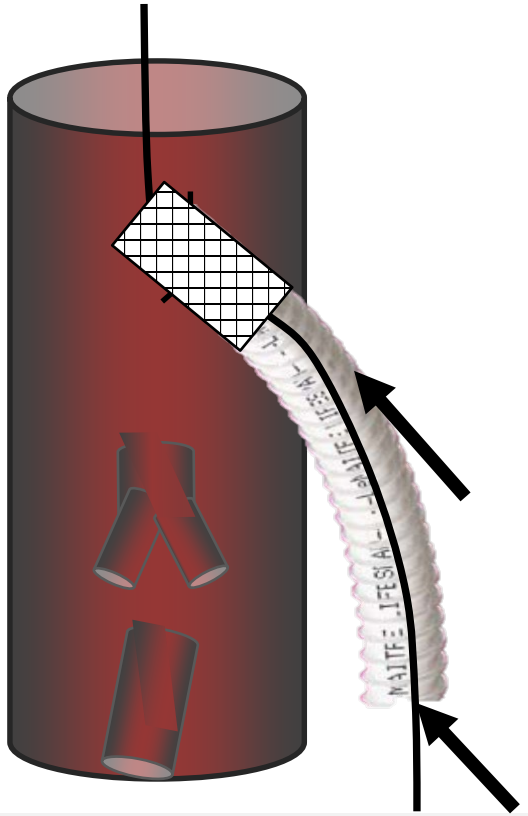

Variations

Clampless Anastomosis

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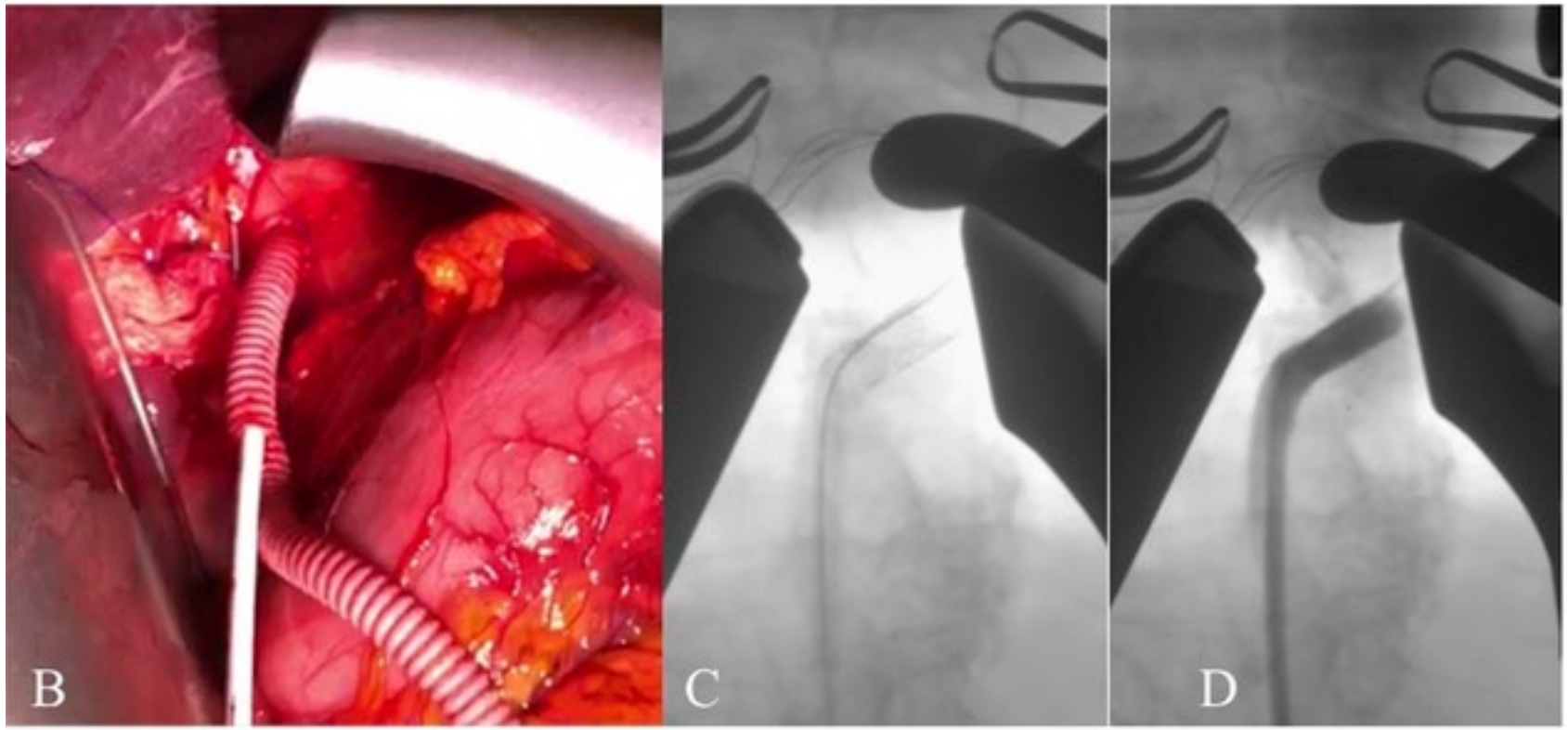

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Variations

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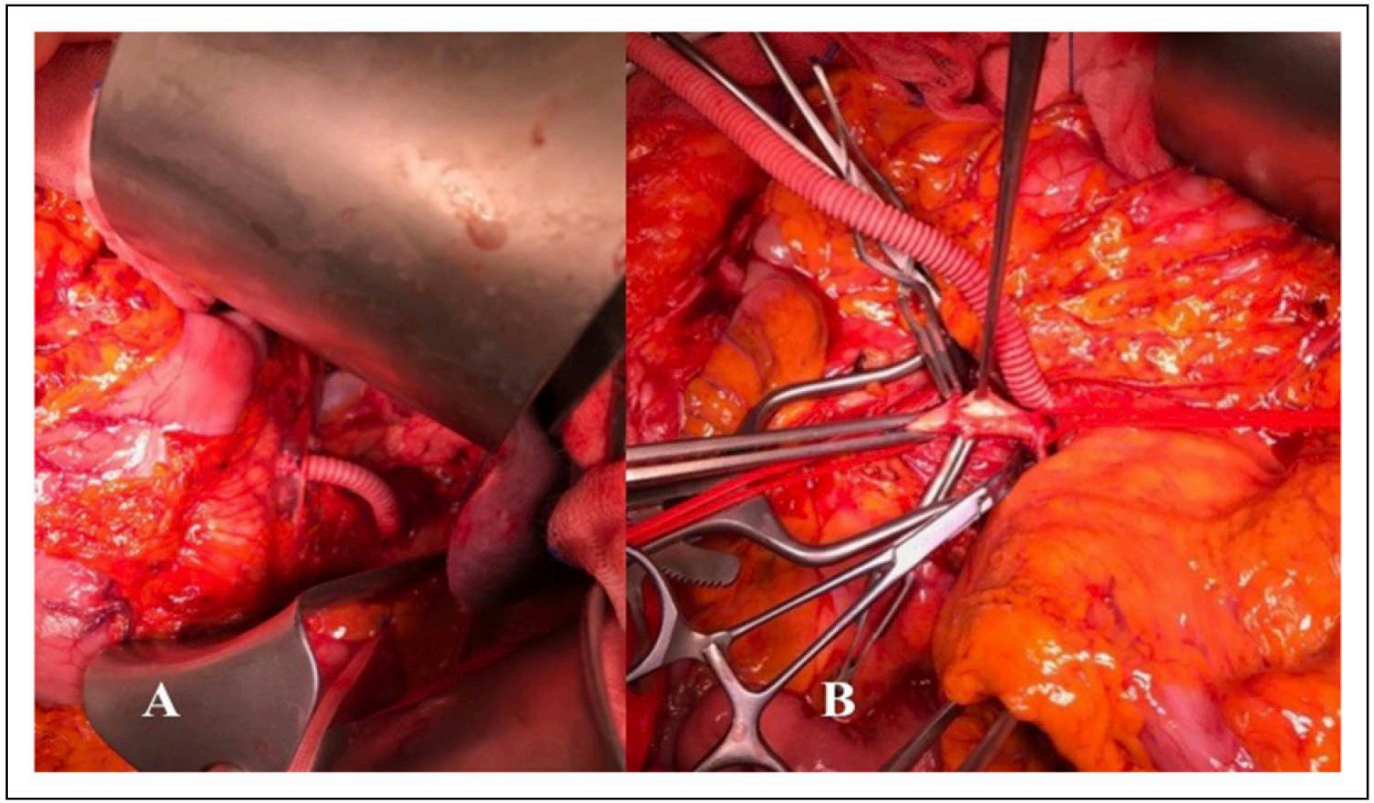

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LITERATURE

Literature

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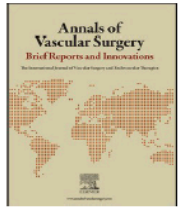


Retrograde Open Mesenteric Stenting: A Case Report and Literature Review

Suren Jeevaratnam [a,b], Houssam Farres [a], Camilo Polania-Sandoval [a], Yetzali Claudio-Medina [a], Hennessy Morales-Arroyo [a], Young Erben [a,*]

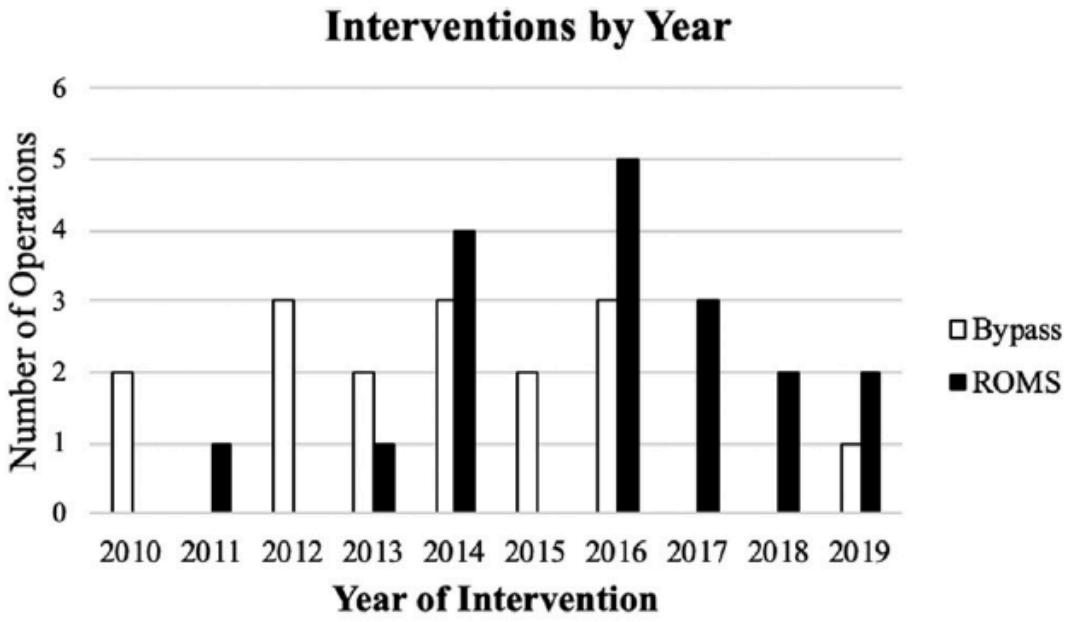
[a] Division of Vascular and Endovascular Surgery, Mayo Clinic, Jacksonville, FL
[b] West Virginia School of Osteopathic Medicine, Lewisburg, WV

Year	Author	Study Design	N of patients	Technical success	Conversion to Bypass	30-day Mortality	Primary patency at 1-year	Primary patency at 2-year	Survival at 1-year
2024	Habib et al.	Retrospective	42					NR	
2023	Cirillo-Penn et al.	Retrospective	34					NR	
2021	Senemaud et al.	Retrospective	37					NR	
2020	Andraska et al.	Retrospective	18					16 (87.50%)	
2019	Roussel et al.	Retrospective	25					NR	
2018	Oderich et al.	Retrospective	54					76±8%	
				90-98%	< 5%	20-40%	75 -90%		50-65%

From the Eastern Vascular Society

Retrograde open mesenteric stenting should be considered as the initial approach to acute mesenteric ischemia

Elizabeth Andraska, MD, MS, Lindsey Haga, MD, Xiaoyi Li, MD, Efthymios Avgerinos, MD, PhD, MSc, Michael Singh, MD, Rabih Chaer, MD, MS, Michael Madigan, MD, MS, *and* Mohammad H. Eslami, MD, MPH, *Pittsburgh, Pa*



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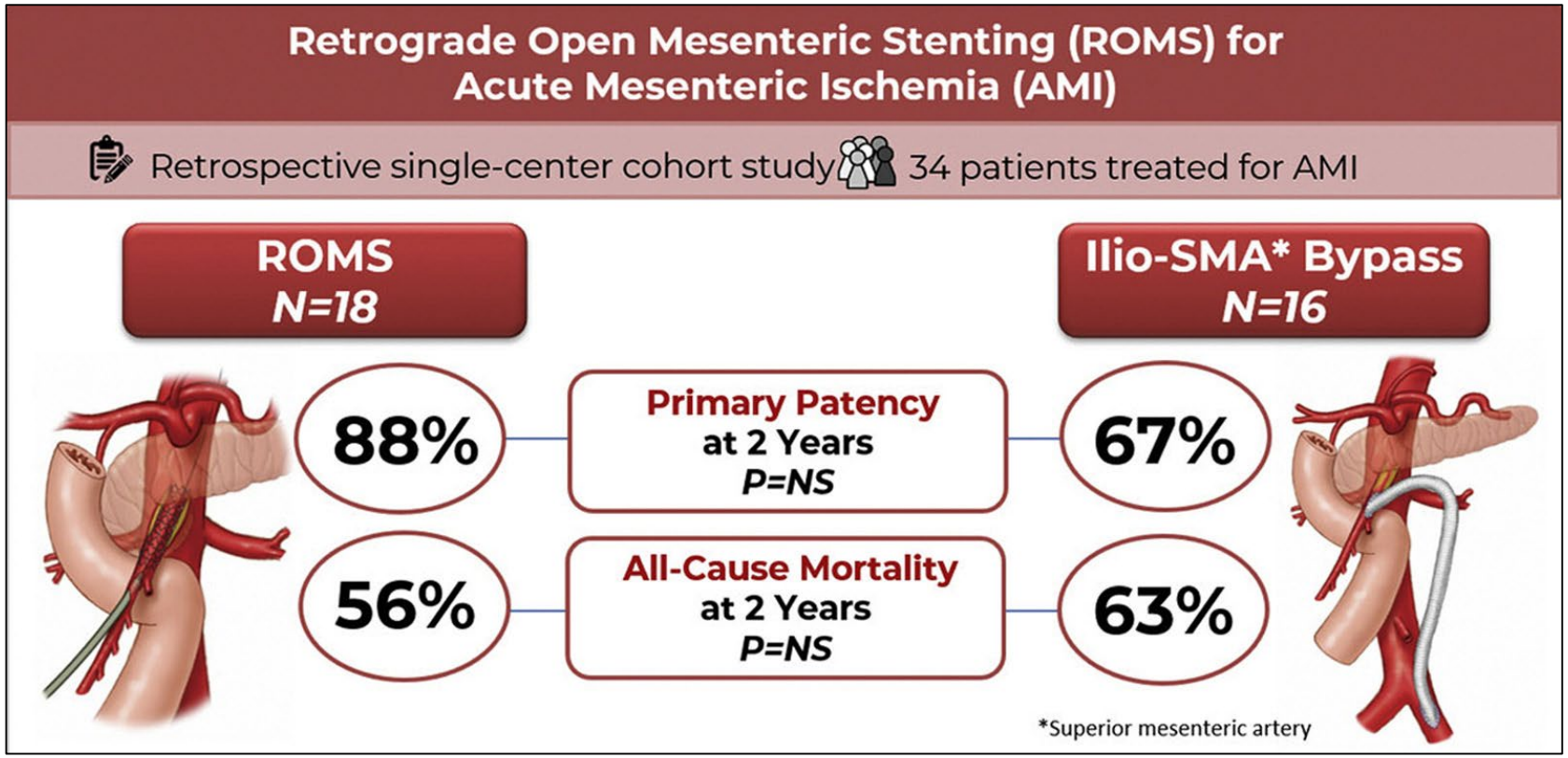
Literature



Conclusions: Complication, reintervention, and mortality rates after ROMS are similar to those of mesenteric bypass in the setting of AMI. Given similar postoperative outcomes and ability to perform these procedures in a conventional operating room but with significantly shorter operative times, ROMS should be considered a first-line option in acute situations when the operator is comfortable performing the procedure. (J Vasc Surg 2020;72:1260-8.)

OUR EXPERIENCE…

Our Experience

CHU de Québec

CHU DE QUEBEC 2020-2025 23 patients	
Age	**73 yo** (63-86)
Gender	**8M: 15F**
Diagnosis	**14 Acute: 9 Chronic**
Technical success	**96%** (22/23)
30d Mortality	**17%** (4/23) **29%** for acute
1y Mortality	**33%** (6/18)
Patency at 1 year	**92%** (11/12)

Our Experience…

CHU de Québec

CHU DE QUEBEC 2020-2025 23 patients	
Number of stents	**1-3**
Stents	**Atrium, VBX, Innova, Xlence**
Stent Size	**5-8mm**
Arterial closure	**12 Primary : 11 Angioplasties**
Patch angioplasty	**5 Veins : 6 Bovine pericardial**
Bowel resection	**Acute: 71%**

In Summary

INDICATIONS

CHRONIC

- Flush occlusions
- Stenosis that are difficult to cross with standard guidewire techniques

ACUTE

- Patients who already have an indication for laparotomy to address bowel
- Favorable lesions

ADVANTAGES

- Allows expeditious access and revasc.
- Less risk of distal embolization
- The proximity of the sheath to the lesion offers excellent support
- No aortic cross-clamping
- No vein harvest
- Avoid prosthetic in contaminated field

Conclusion

- Mesenteric ischemia is increasing in incidence
- Bypass and antegrade stenting have been mainstay of the treatment
- ROMS allows expeditious revascularization
  - In AMI who need laparotomy for exploration
  - In CMI with flush mesenteric occlusions not suitable for antegrade stenting
  - Shorter OR time and similar technical success rates
- Limitations
  - Location of stent placement
  - Type of stent implanted (covered vs uncovered)
  - Stent complications
  - AMI carries high mortality rate

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Thank you