

TIPS, TRICKS AND GETTING OUT OF TROUBLE:

Magnetic Compression Anastomosis

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Disclosure Slide

Nothing to disclose



200 Years of Compression Anastomosis

A CHRONOLOGY OF CONTROLLED COMPRESSION



1826
Denans

Early experimental
compression anastomosis.



1892
Murphy Button

Sutureless compression
enters surgical practice.



20th century
**AKA-2 and
biofragmentable ring**

The compression
concept expands.



Late 20th century
**Experimental
magnetic systems**

Fixed and paired magnetic
approaches emerge.



2009
Magnamosis

Controlled magnetic
compression
characterized.



2020s
**Modern magnetic
platforms**

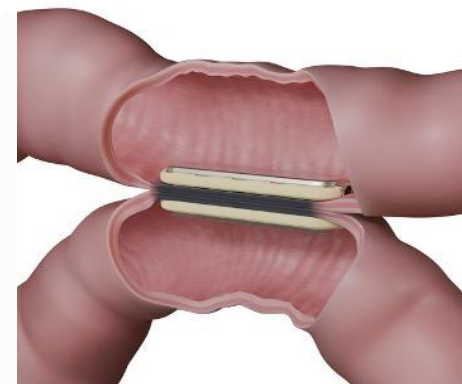
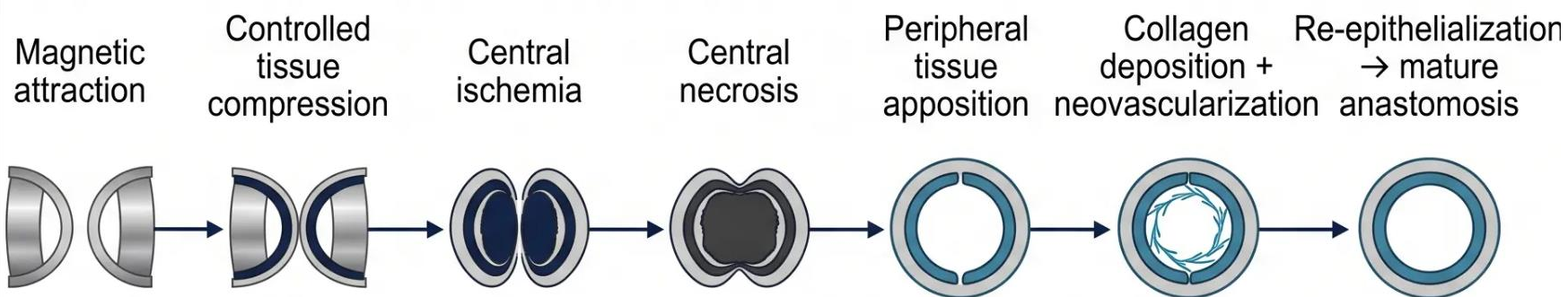
Geometry, delivery,
immediate-lumen adjuncts,
and metabolic
applications.

The concept is old. Our ability to control compression, delivery and geometry is new.

Kaidar-Person O, et al. Am J Surg. 2008;195:818–826. · Hardy TG Jr, et al. Dis Colon Rectum. 1985;28:899–901.
Jamshidi R, et al. J Pediatr Surg. 2009;44:222–228. · Wall J, et al. Endoscopy. 2013;45:643–648.

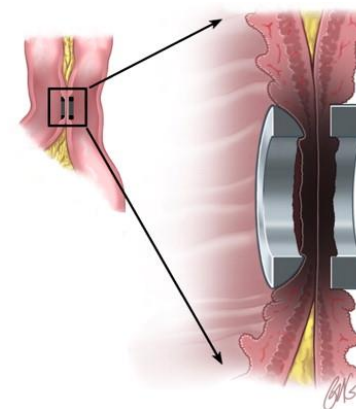
The Biology Behind Magnetic Anastomosis

PROGRESSIVE COMPRESSION HEALING



Central tissue:
ischemia → necrosis

Healing perimeter:
apposition, collagen deposition,
neovascularization



The center undergoes controlled necrosis
while the perimeter heals

PUBLISHED EXPERIMENTAL EVIDENCE

Published porcine histology reported favorable early seal formation, lower acute inflammation and less early bacterial infiltration, with favorable neoangiogenesis and re-epithelialization metrics versus stapled anastomosis.



Magnetic Compression Anastomosis

Kaur A, Shaikh S, Valdivieso Randa SC, Bekhari F, Masl VR · SAGES 2026 · Surgical Endoscopy · PREMA 2020 · PROSPERO #1268382

HISTORICAL EVOLUTION OF COMPRESSION ANASTOMOSES 1892 → 2026

13 studies · 9 countries · 106 patients



KEY OUTCOMES



HOW MCA WORKS

Real first. Open second. — A biological paradigm shift in anastomosis.



• Pooled + Randomized
Controlled

• RCTs + CASE QA

• Narrative synthesis

CLINICAL APPLICATIONS

- ES:**
Distal esophageal strictures
- Whipple C2**
T10, duodenal cancer · Distal biliary ducts · T-tubes
- Restorix (MagE4/MagE2)**
87% T2D resolution · 1-day stay · no hospital
- Endovascular**
NET, tumor 1.4 cm · not without procedure

0 V106 leaks · 0 V106 deaths · SAFETY PROFILE

- Thoracic instruments required — No PFT, holds without steel body
- Postoperative / ICU (exclusive) minimal — MRI contraindicated in situ

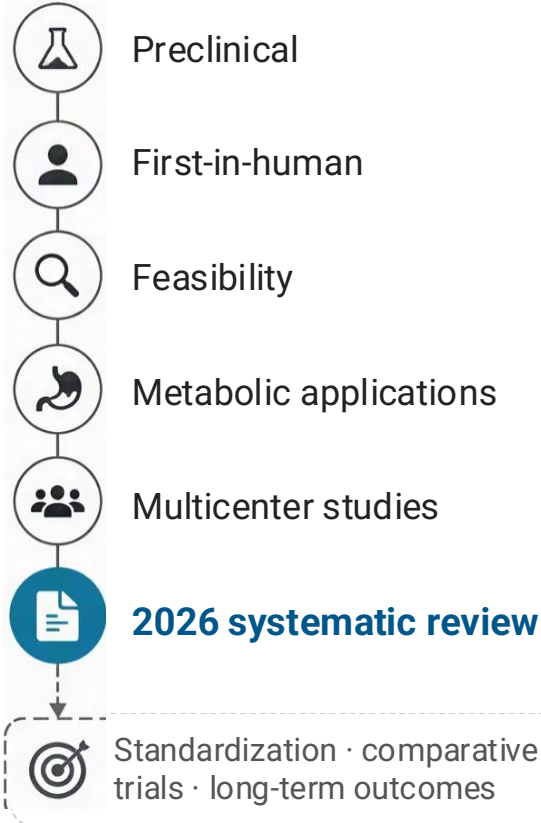
MAGNET DEVICE TYPES — MCA is a Platform Technology, Not a Single Device



Magnetic Anastomosis: Current Evidence and Evolution

SYSTEMATIC REVIEW · EARLY HUMAN EXPERIENCE

Kaur A, Shaikh S, Valdivieso Rueda SC, Bokhari F, Mani VR. Surg Endosc. 2026.



2026 SYSTEMATIC REVIEW		
13 studies	106 patients	9 countries
5 prospective first-in-human trials	2 retrospective cohorts	6 case reports
At least 8 device architectures.		

REPORTED MCA-ATTRIBUTABLE LEAKS

0 / 106

reported in included early human literature



EARLY HUMAN EXPERIENCE — NOT PROOF OF ZERO LEAK RISK.

- Small cohorts
- Heterogeneous indications
- Multiple device architectures
- No randomized comparative evidence
- Limited long-term outcomes / publication bias

The evidence is promising—but the learning curve matters.

That is where tips, tricks, and getting out of trouble become important.

Pre-Operative Safety and Magnetic Compatibility

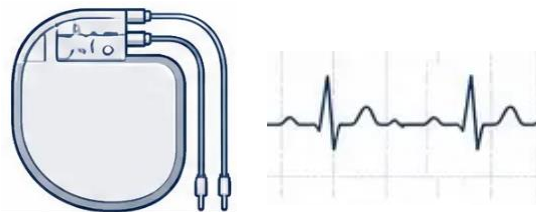
BEFORE MCA — SCREEN THE PATIENT, THEN REVIEW THE SPECIFIC DEVICE IFU.



ANTICIPATED MRI?

For GT Metabolic MagDI: magnets are MR Unsafe.

No MRI while magnets remain in the body.



IMPLANTED ELECTRICAL DEVICE?

For GT Metabolic MagDI: current reviewed labeling contraindicates pacemaker, defibrillator, and potentially interacting electrical or metal implants.



METALLIC IMPLANTS / DEVICE INTERACTION?

Do not generalize restrictions across platforms. Confirm the labeling for the exact MCA system.



MAGNET
PLACED



PATIENT REMAINS
MAGNETIC



PASSAGE CONFIRMED
BY RADIOGRAPHY



MRI MAY BE
RECONSIDERED
ACCORDING TO
DEVICE LABELING

The patient remains a magnetic patient until magnet passage is confirmed.

GT METABOLIC MAGDI — DEVICE-SPECIFIC SAFETY INFORMATION.

Current reviewed MagDI labeling: MRI is contraindicated when expected within 40 days after placement or before device passage; confirm expulsion radiographically before MRI.

GI Windows: Techniques for Self-Forming Magnets

DIFFERENT MAGNET. DIFFERENT TECHNIQUE.

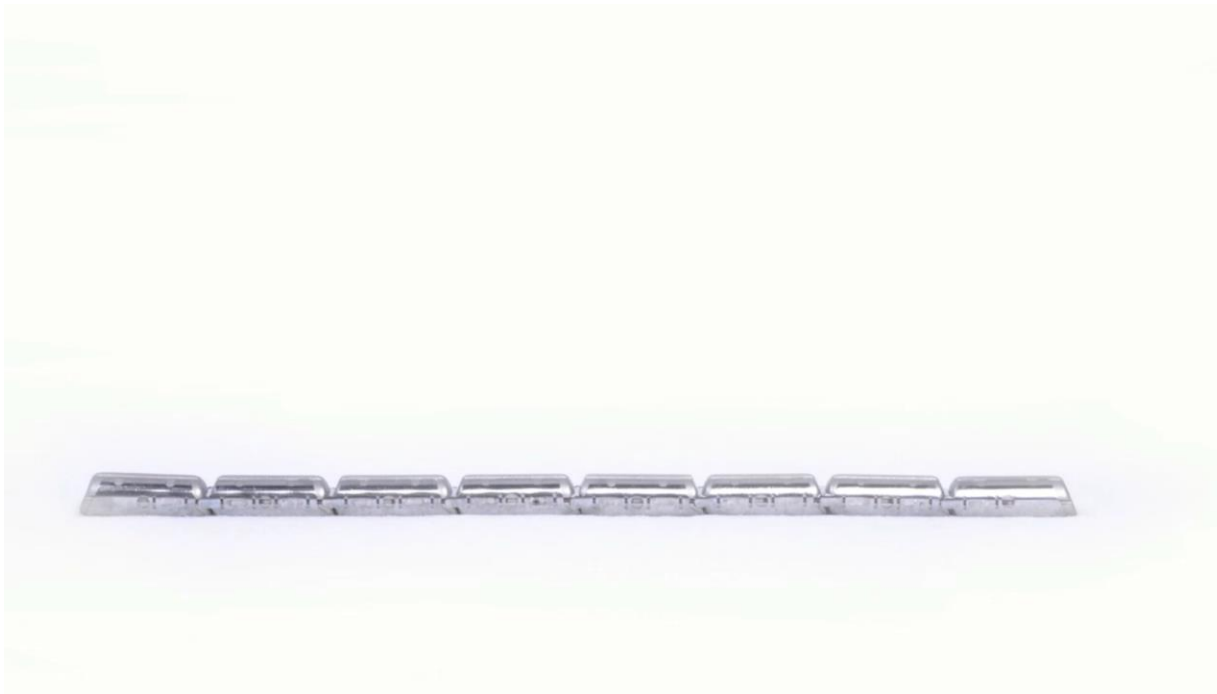
1 DELIVER

2 ORIENT

3 CLEAR

4 INITIATE COUP

5 SELF-FORM +



Let the magnet self-form—
but only after you create the right geometry.



TECHNICAL PEARL —
EXPERT EXPERIENCE

Know when not to couple: excessive tension, inadequate mobility, uncertain orientation, tissue interposition, or uncertain anatomy.



FLows pivotal study —
prospective, multicenter,
single-arm; 79 patients
at six centers.

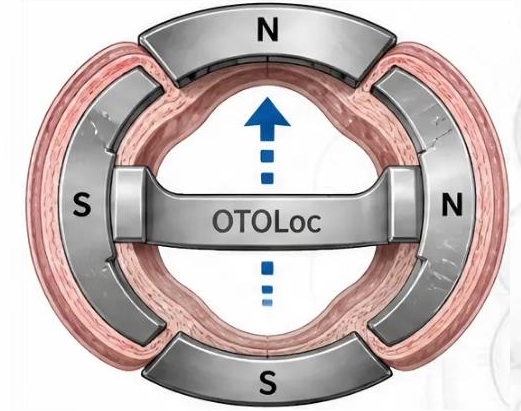


FDA 510(k) K253550 —
decision January 9, 2026.



Cleared indication —
side-to-side jejunum-jejunum
and ileum-ileum anastomoses
in adults older than 21 years.

OTOLoc CONCEPT



1

1 MAGNETIC COUPLING



2

2 OTOLoc preserves enterotomy /
immediate fluidic flow



3

3 COMPRESSION + HEALING
→ MAGNET PASSAGE



FDA DOCUMENTATION: ENTEROTOMY
PRESERVATION FOR IMMEDIATE FLUIDIC FLOW

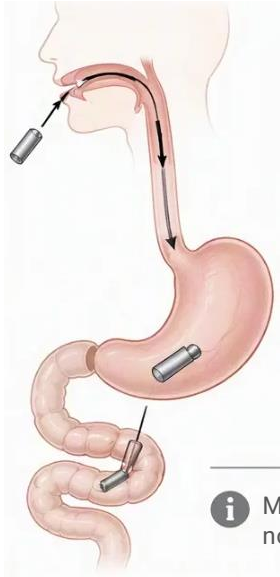


GT Metabolic MagDI: First Magnet Delivery Strategies

DEVICE-SPECIFIC DELIVERY PATHWAYS

1 • SWALLOW

TECHNICAL PEARL — EXPERT EXPERIENCE



- Least invasive when suitable
- Swallow with water
- Allow physiologic progression, then position laparoscopically.

i Mineral oil: expert experience; not verified in reviewed IFU.

2 • ENDOSCOPY

PUBLISHED / IFU-SUPPORTED DELIVERY



- Dedicated controlled orogastric/endoscopic delivery
- Precise positioning
- Useful when swallowing is not feasible or progression is inadequate.



If a swallowed magnet has progressed too far, do not force the planned procedure.

3 • ENTEROTOMY

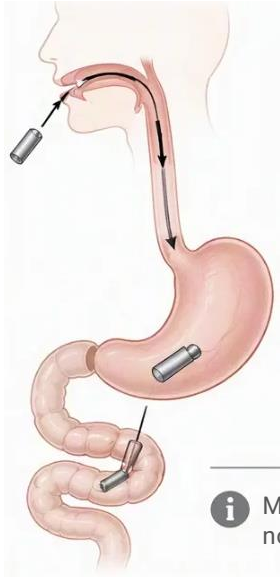
DEVICE-SPECIFIC IFU BAILOUT



- Direct placement or retrieval when progression fails
- Use when anatomy prevents safe advancement
- Have enterotomy-closure capability available as backup.

Never force a delivery strategy that isn't working.

1 • SWALLOW



- Least invasive when suitable

- Allow physiologic progression, then position laparoscopically.

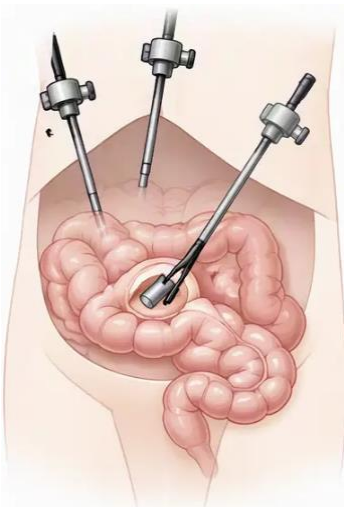
i Mineral oil: expert experience; not verified in reviewed IFU.



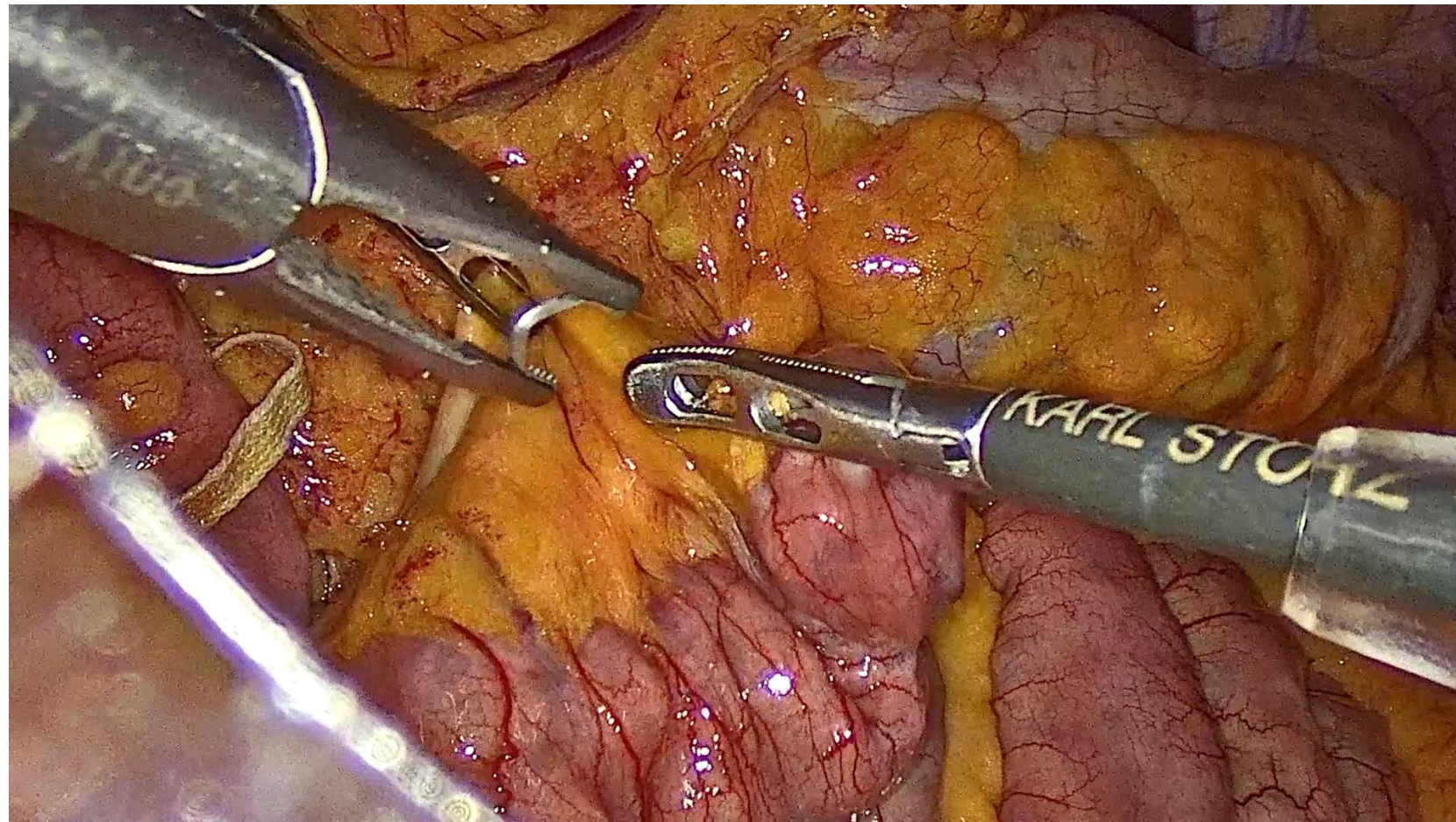
LUZ AIDA PULIDO LASSO
40329246
F / 42
ABDOMEN AP (SUPINO)
2026-03-02
08:04:36
TABLE BUCKY
93.00 [kV]
320.00 [mA]
64.00 [ms]
20.48 [mAs]
DER
R SUPINE
421
W: 33568, WW: 59560

3 • ENTEROTOMY

DEVICE-SPECIFIC IFU BAILOUT



- Direct placement or retrieval when progression fails
- Use when anatomy prevents safe advancement
- Have enterotomy-closure capability available as backup.



● — Surf It. Don't Drag It.

The LPD provides external laparoscopic magnetic control of an intraluminal linear magnet.

LPD — LAPAROSCOPIC POSITIONING DEVICE

More magnetic force is not necessarily better.

The magnet may be atraumatic. Your instrument may not be.



TECHNICAL PEARL — EXPERT EXPERIENCE

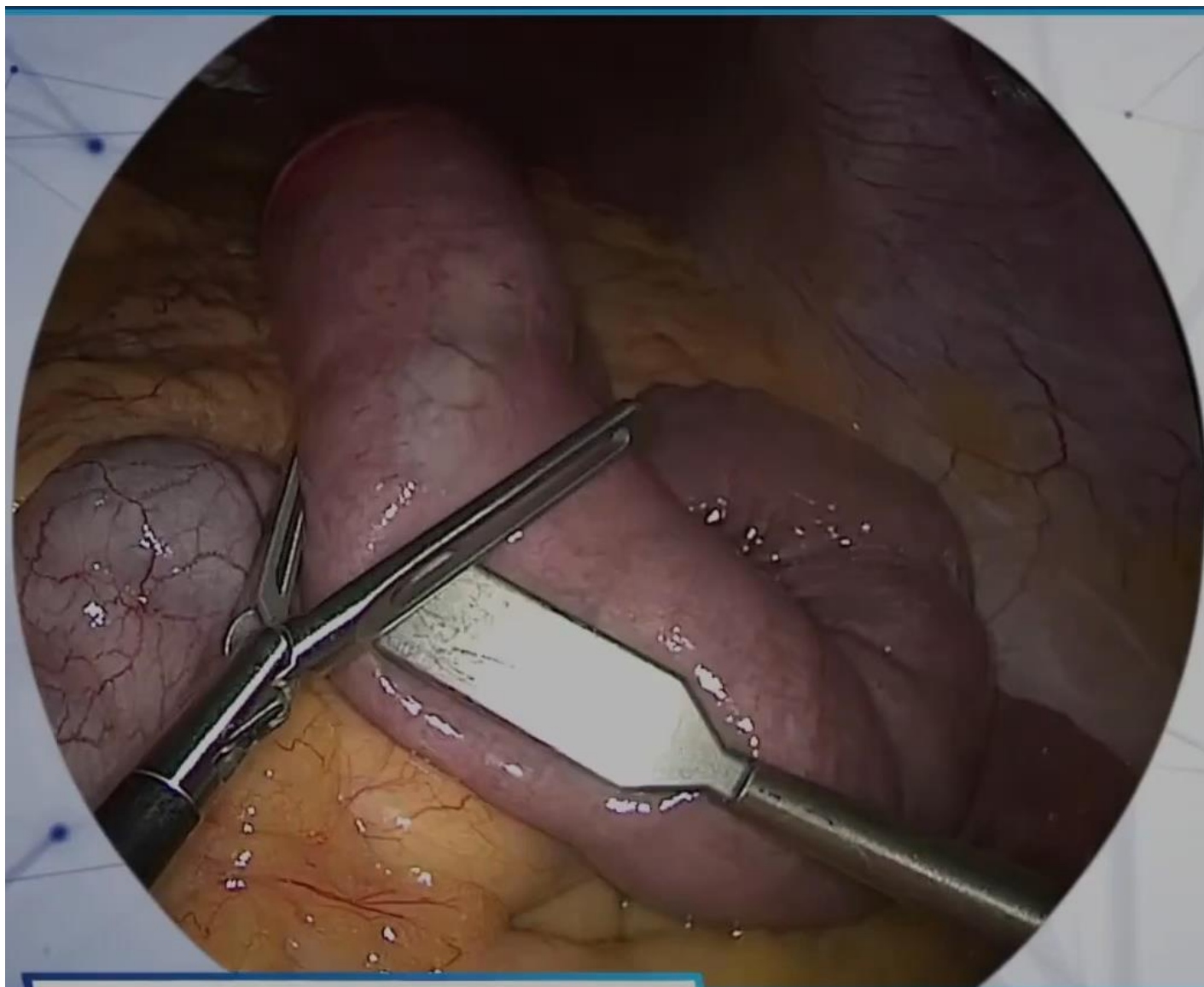
- ✓ Use short, sequential movements.
- ✓ Move and straighten bowel around the magnet.
- ✓ Use broad, atraumatic bowel handling.
- ✓ Stop when resistance increases.
- ✓ Reassess angle, relaxation, and LPD selection.



NEVER

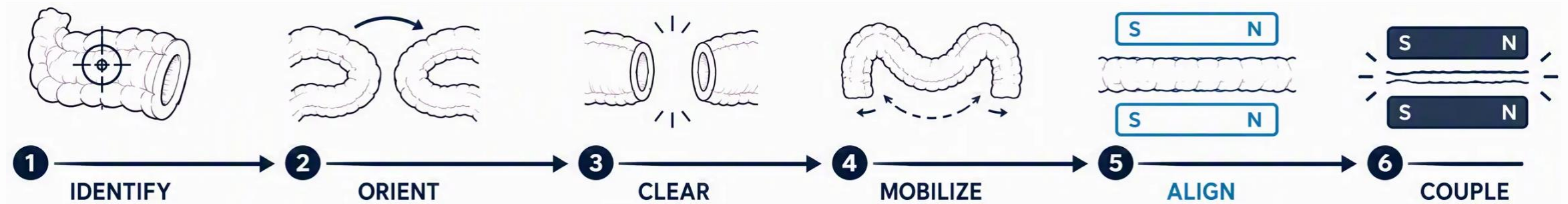
- ✗ Do not pull against mesenteric resistance.
- ✗ Do not apply focal traction.
- ✗ Do not force an angulated loop.



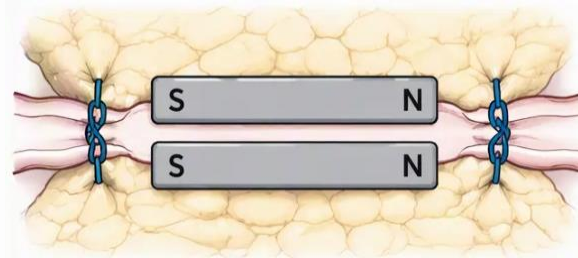


Alignment Before Attraction: Coupling and Stabilization

TECHNIQUE DISCIPLINE



Magnetic attraction should complete your positioning—not correct it.



TECHNICAL PEARL – EXPERT EXPERIENCE

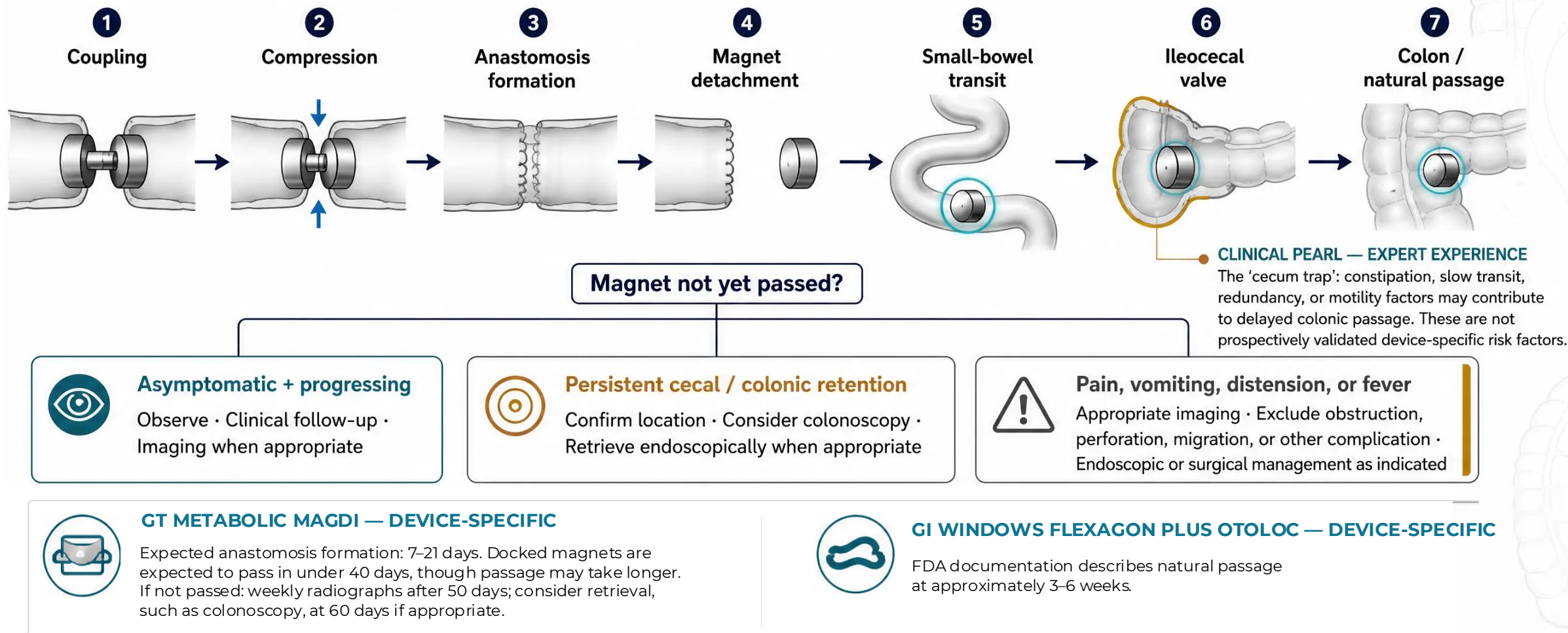
In substantial visceral adiposity or heavy mesentery, two end-stabilization stitches may maintain parallel alignment and reduce early shear.

This maneuver is not prospectively validated.

● Post-Procedure Management: Transit and Device Passage

FOLLOW-UP AFTER MAGNETIC COMPRESSION ANASTOMOSIS

Follow the magnet until you know it has passed.



Delayed passage ≠ failed anastomosis.

Do not operate on a magnet that can be safely retrieved endoscopically.



XXIX IFSO World Congress

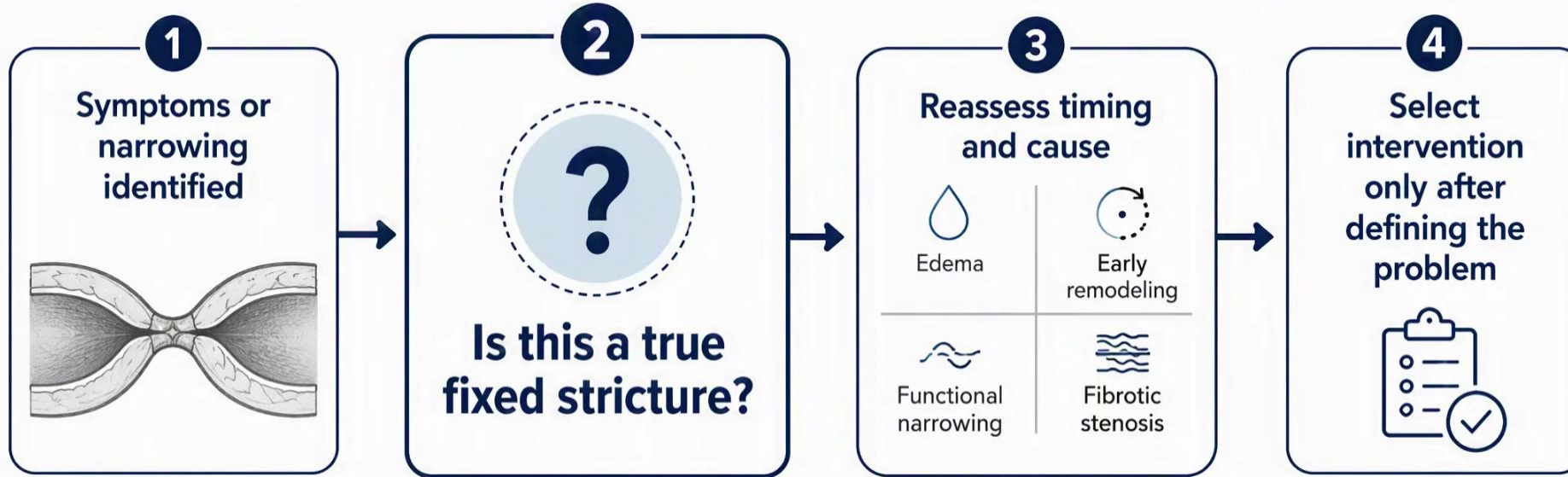
1-4 September 2026
Toronto, Canada



Managing Strictures and Preventing Perforation

DON'T TURN A STRICTURE INTO A PERFORATION

DEVICE-SPECIFIC WARNING — GT METABOLIC MAGDI



Timing relative to magnet release and passage



Anatomy



Symptoms



Imaging / endoscopic assessment when clinically indicated



CLINICAL PEARL — EXPERT EXPERIENCE

Pause before treating an early narrowing as permanent stenosis.



MAGDI IFU WARNING:

Do not dilate a magnetic compression anastomosis.

Risk: perforation / defect and bleeding.

particularly in duodenal magnetic anastomosis.

STOP-IDENTIFY-CORRECT-CONFIRM Troubleshooting Algorithm

SYSTEMATIC RESPONSE TO TECHNICAL PROBLEMS

When geometry, tissue integrity, or control is uncertain, pause before proceeding.

1 – STOP

pause forceful advancement or further coupling; stabilize the bowel and instruments.



2 – IDENTIFY

determine whether the problem is advancement failure, bowel injury, malalignment, or partial separation.

3 – CORRECT

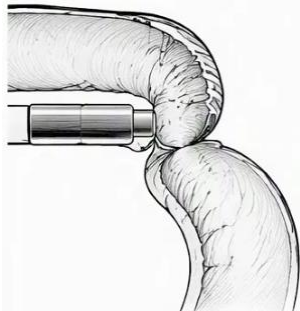
restore anatomy, release tension, clear interposed tissue, reassess the device-specific pathway, and repair or escalate when indicated.

4 – CONFIRM



verify intended anatomy, parallel alignment, bowel-wall apposition, absence of trapped tissue, acceptable tension, and tissue integrity before continuing.

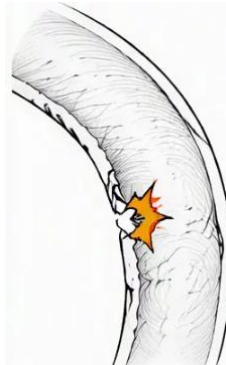
ADVANCEMENT FAILURE



Stop traction · Reassess angle and mesenteric geometry · Reposition bowel rather than forcing the magnet.

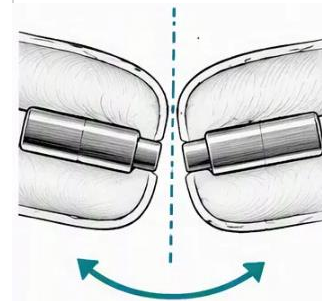
TECHNICAL PEARL – EXPERT EXPERIENCE

BOWEL INJURY



Recognize early · Assess severity · Repair or perform surgical management as indicated · Do not continue forceful manipulation.

MALALIGNMENT



Separate only if safely feasible · Re-identify bowel segments · Eliminate twist, tension, and tissue interposition · Re-align in parallel.

PARTIAL SEPARATION



Stop · Assess tension and shear · Restore parallel contact and stabilization · Confirm complete coupling before proceeding.

TECHNICAL PEARL – EXPERT EXPERIENCE



DO NOT USE MAGNETIC ATTRACTION TO CORRECT UNCERTAIN ANATOMY

Trouble becomes injury when the surgeon keeps moving.

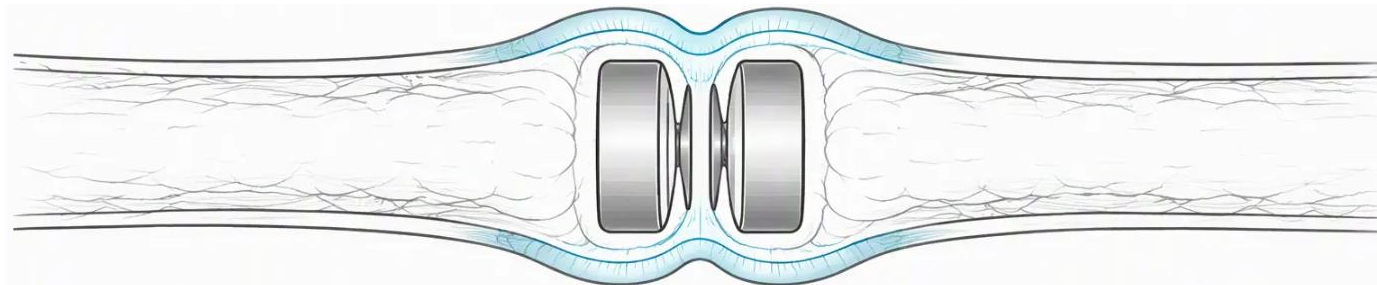
12 Rules for Safe Magnetic Anastomosis

FINAL SAFETY CHECKLIST

1 Know the exact device labeling	2 Confirm anatomy and indication	3 Screen for MRI and implant conflicts	4 Choose the delivery route early
5 Never force a failed delivery	6 Create geometry before coupling	7 Clear all interposed tissue	8 ALIGN BEFORE ATTRACTION
9 SURF — DON'T DRAG	10 More force is not always better	11 Follow the magnet until it passes	 Don't turn a stricture into a perforation

FINAL PRINCIPLE

**THE MAGNET CREATES THE ANASTOMOSIS.
THE SURGEON CREATES THE CONDITIONS FOR IT TO HEAL.**



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