
XXVIII IFSO World Congress
9-12 September 2025 | Santiago, Chile
COMBINED THERAPIES, THE DAWN OF A NEW ERA
IFSO
SANTIAGO 2025
MAGNETIC COMPRESSION ANASTOMOSIS:
PAST, PRESENT AND FUTURE
IFSO 2025 Santiago
Combined Therapies, The Dawn of a New Era
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Disclosure

- LEVITA MAGNETICS
- GI WINDOWS
- AQUA MEDICAL

Introduction

Magnetic Compression Anastomosis (MCA).

Principle = *magnets create pressure necrosis → controlled fistula → anastomosis without sutures or staples.*

PubMed®

"magnetic compression anastomosis"

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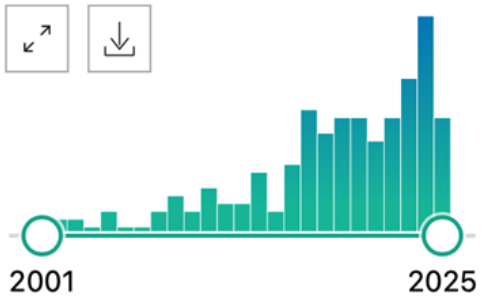
RESULTS BY YEAR



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Cite

Magnetic compression anastomosis for benign obstruction of the common bile duct.

Takao S, Matsuo Y, Shinchi H, Nakajima S, Aikou T, Iseji T, Yamanouchi E.

Endoscopy. 2001 Nov;33(11):988-90. doi: 10.1055/s-2001-17923.

PMID: 11668410

Advances in interventional radiology have made possible **magnetic compression anastomosis** between the bile duct and the small intestine as a novel treatment. ...Two magnets were immediately attracted towards each other transmurally, and anastomosis was establi ...

Historical Background (Past)

Early experimental work (1970s–1990s, animal models).

Case Reports > Khirurgiia (Mosk). 1993 Mar:(3):10-18.

[Endoscopic biliodigestive anastomosis with the use of magnets (experimental and clinical study)]

[Article in Russian]

V S Savelév, M V Avaliani, S A Kapranov, A D Bashirov, T B Boldina

Comparative Study > Arkh Patol. 1978;40(8):56-61.

[Sutureless anastomoses in gastrointestinal surgery with and without steady magnetic field (experimental study)]

[Article in Russian]

N N Kanshin, N K Permiakov, R A Dzhalagoniia, B I Nikulin, A A Kuznetsov

First clinical applications (pediatric biliary atresia, esophageal strictures, intestinal bypass).

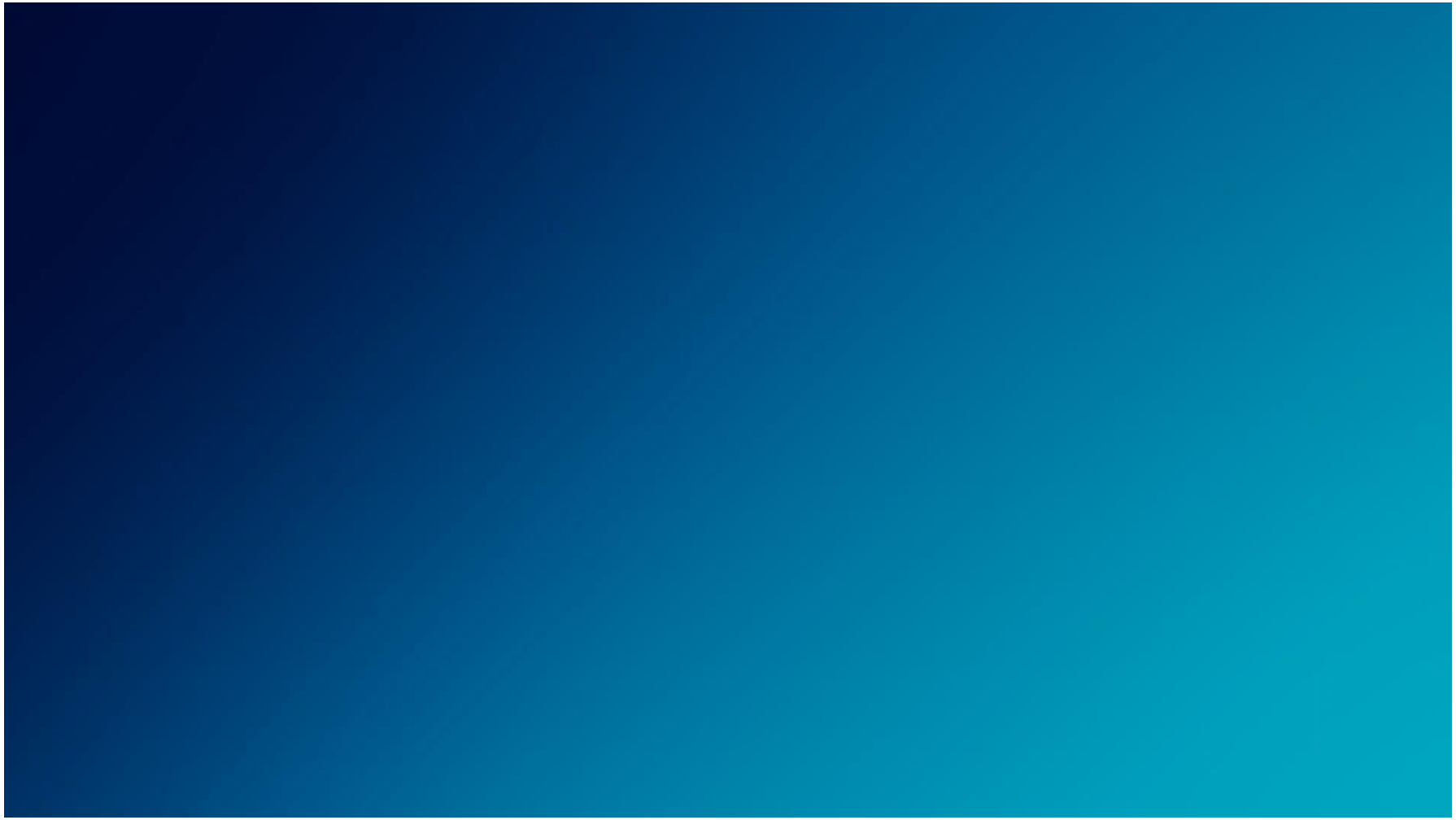
> Neth J Surg. 1980;32(1):20-7.

Early experiences with magnetic rings in resection of the distal colon

A Jansen, J N Keeman, G A Davies, P J Klopper

Limitations in early adoption (device design, availability, safety concerns).

Current Applications (Present)



Evidence & Outcomes

Summarize main published results:

- High anastomosis patency rates (80–95%).
- Reduced leakage risk compared to stapled/sutured.
- Shorter procedure times.

Mention limitations: strict patient selection, small series, need for standardization.

Advantages

Minimally invasive, sutureless, reduced leak rate.

Potential cost savings, less OR time.

Endoscopic delivery in some contexts.

Challenges / Limitations

Only use in bipartition technique

Device availability and regulatory approval.

Risk of magnet migration or incomplete anastomosis.

Limited long-term data in bariatric surgery.

Learning curve and standardization issues.

Technological Advances (Future)

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Pioneering Magnets: The First Experience with Self-Forming Magnets and the OTOLoc Delivery tool to create a primary patent Anastomosis.

13- Diciembre 2023

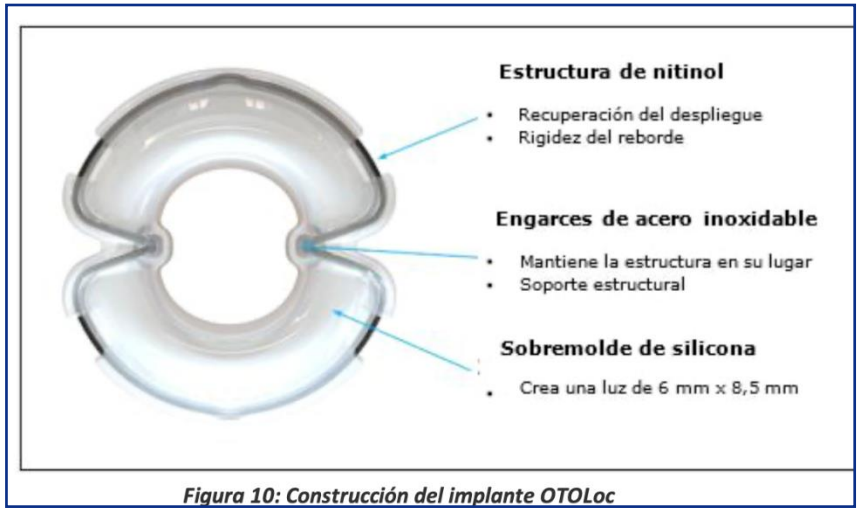


Figura 10: Construcción del implante OTOLoc

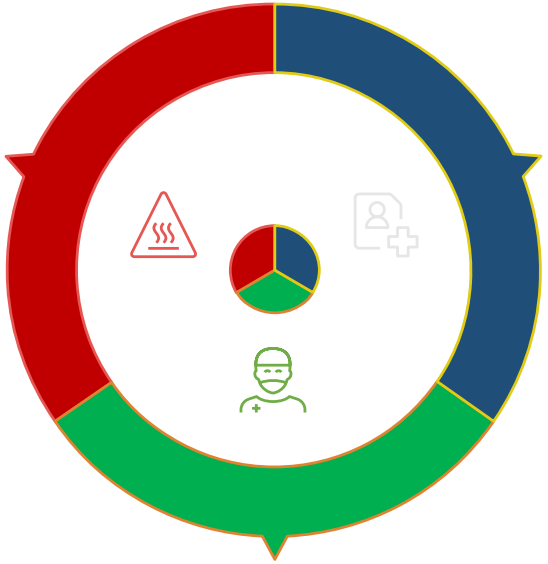
Y-Y Anastomosis en bypass gástrico con imanes + OTOLoc

PRIMER CASO EN EL MUNDO

RYGB J-J Feasibility Results

Patient Demographics

- 5 Pts were recruited (sex ratio 60% Female)
- Mean age of 35.8
- Initial BMI of 44.8 ±7.6 kg/m2



Procedures

- All procedures were performed laparoscopy.
- There was no conversion or peri-operative mortality.
- All ECC's & SFMs were delivered and connected with no delivery malfunctions
- Average anastomosis creation time of 10 min (enterotomy to coupling)
- All ECC and SFMs passed with no retentions

Surgical Endoscopy

Safety and Early Results of Immediately-Patent Magnetic Jejuno-Jejunal Anastomoses (IMPA-JJ) in Roux-en-Y Gastric Bypass.

--Manuscript Draft--

Manuscript Number:	
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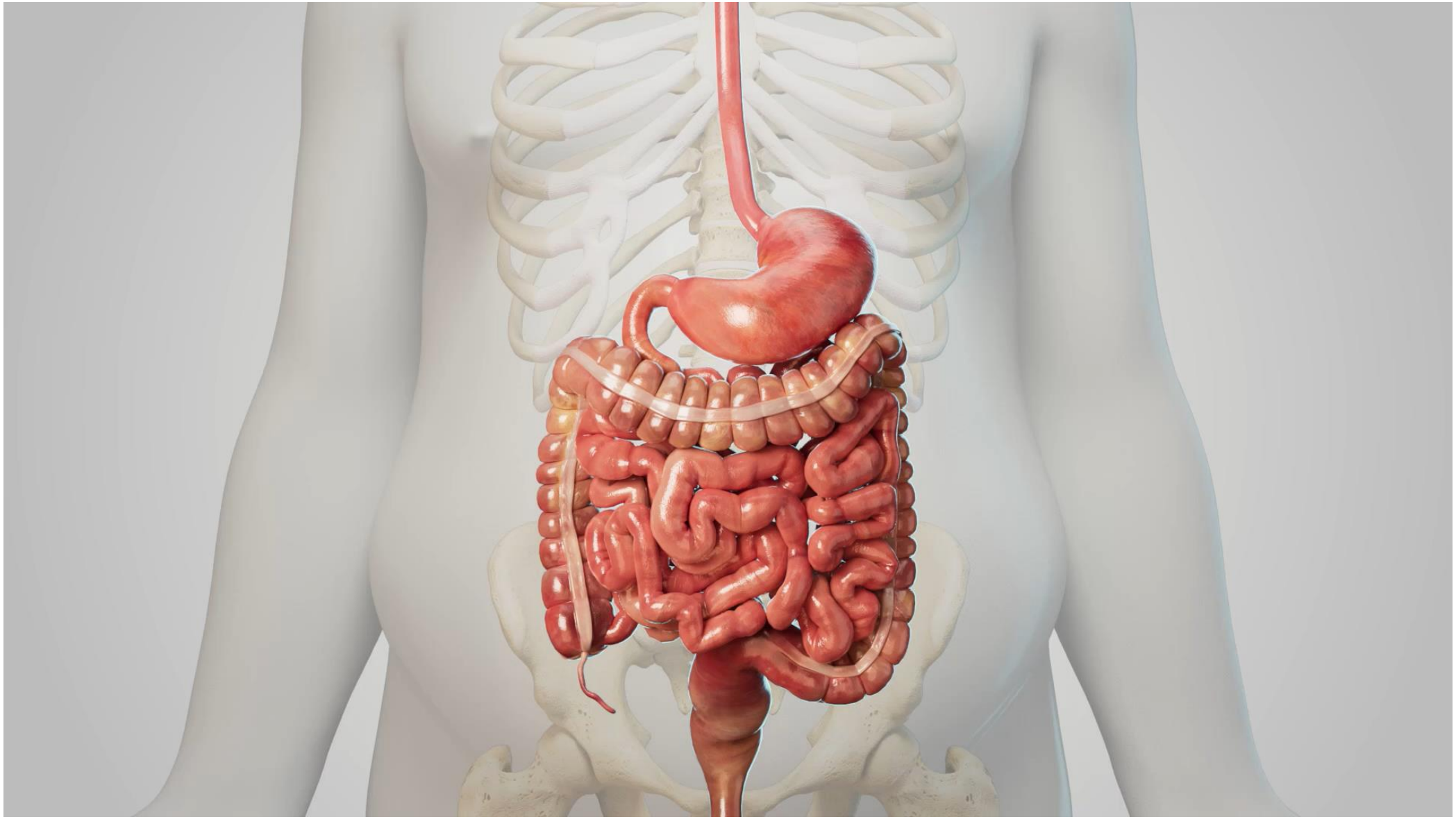

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Future Perspectives in Bariatric Surgery

Could MCA replace staplers in RYGB gastrojejunostomy?

Role in revisional surgery or anastomotic strictures.

Research gaps: long-term safety, multicenter RCTs, metabolic outcomes.

Magnetic Compression Anastomosis (MCA) vs. Traditional Stapled Anastomosis

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Parameter	MCA	Stapled Anastomosis
Operative Time	Shorter. often < 5 min for anastomosis creation)	Longer (suturing/stapling adds 10-20 min depending on complexity)
Leak Rate	Low in early studies (<1% in small series); promising but limited long-term data	Well-documented 1–5% leak risk depending on center and procedure
Cost	Potentially lower (fewer staplers, shorter OR time), but device cost varies and not yet standardized	High (multiple stapler loads; contributes significantly to bariatric surgery expenses)
Technical Demand	Simpler placement once device is available; requires endoscopic or minimal surgical delivery	Requires surgical expertise with stapler handling and/or suturing; standard of care, widely trained
Limitations	Device availability, risk of migration, limited long-term evidence	Well-established, reproducible, universally available

Key Takeaways

MCA has moved from experimental to selective clinical use.

Promising tool in bariatric and GI surgery, but still needs high-quality evidence.

Future = less invasive, more precise, potentially transformative.

References

- **Jamshidi et al., J Pediatr Surg (2009)**
"Magnamosis: magnetic compression anastomosis with comparison to suture and staple techniques" – A landmark porcine study comparing uniform vs. gradient compression MCA with stapled and sutured anastomoses, showing comparable strength and leak resistance, with gradient compression favoring faster patency. PubMed

- **Ore et al., Surgery (2023)**
"Comparative early histologic healing quality of magnetic versus stapled small bowel anastomosis" – Demonstrated that MCA yielded superior early healing, with less inflammation, early neovascularization, and more complete epithelialization than stapled anastomoses in pig models. PubMed

- **Gagner et al., Surgical Endoscopy (2023)**
"Side-to-side duodeno-ileal magnetic compression anastomosis: design and feasibility of a novel device in a porcine model" – Evaluated a new MCA tool in pigs, showing patent anastomoses with minimal inflammation and good histopathologic outcomes. FDA Access DataPMC

- **Evans et al., Obesity Surgery (2024)**
"Evaluation of a Magnetic Compression Anastomosis for side-to-side jejunoileal partial diversion in a nonhuman primate model" – The first MCA application in primates, achieving patent anastomoses, metabolic improvements (decreased HOMA-IR), and significant weight loss. SpringerLink

- **Biertho et al., SOARD (2025)**
"Magnetic duodenoileal anastomosis with sleeve gastrectomy" – Reports improved anastomotic healing and favorable hypoxic remodeling when MCA is used alongside sleeve gastrectomy. soard.org

- **Marrache et al., GIEJ (2021)**
Review article on the evolution of endoscopic gastrointestinal anastomosis including MCA techniques. giejournal.org

- **Zhang et al., Scientific Reports (2022)**
"Establishment of Yan-Zhang's staging of digestive tract magnamosis in a rat model" – Defined healing phases (from magnetic maintenance to stable healing) of MCA through histologic and mechanical benchmarks.

Thank you

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