Minimally Invasive and Novel Therapeutics (M.I.N.T.) in Foregut Disease
September 29th -October 1st 2022

Endoscopic resection of gastric GIST

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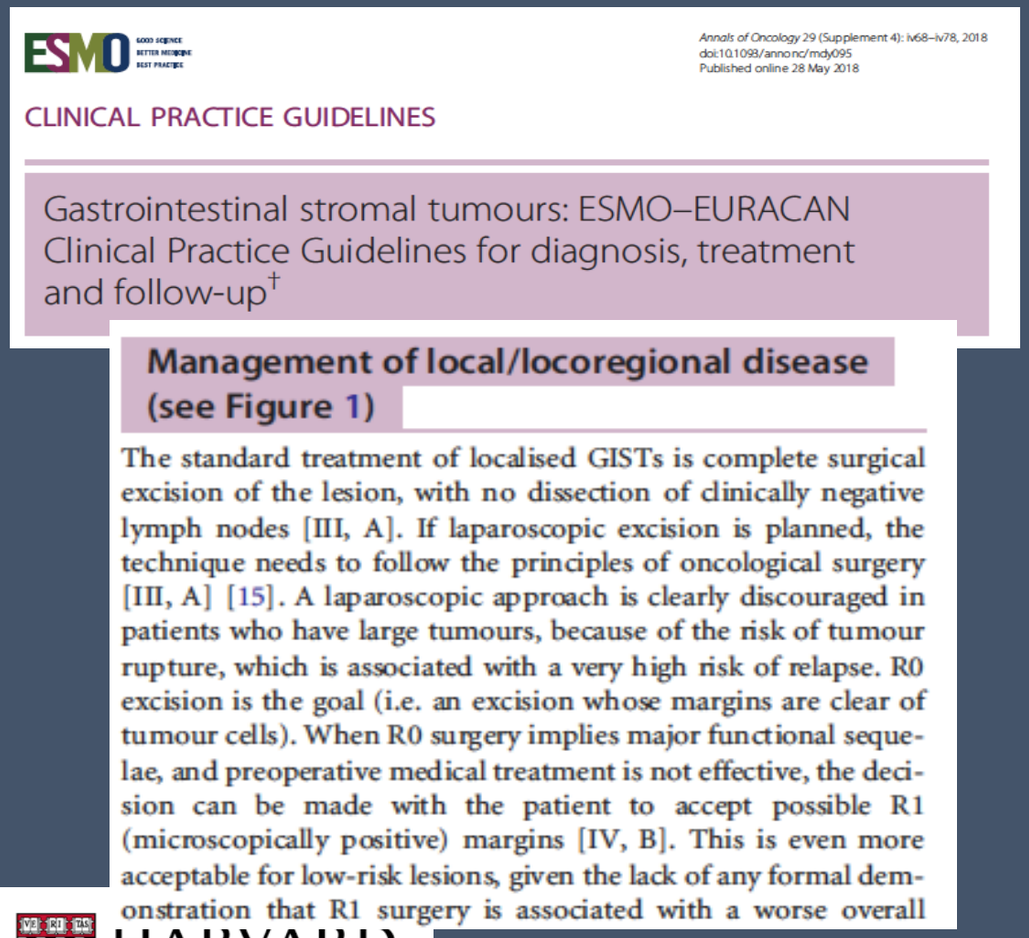
ESMO Guidelines on the management of GIST 2018 vs 2021



ESMO GOOD SCIENCE BETTER MEDICINE BEST PRACTICE

Annals of Oncology 29 (Supplement 4): iv68–iv78, 2018
doi:10.1093/annonc/mdy095
Published online 28 May 2018

CLINICAL PRACTICE GUIDELINES

Gastrointestinal stromal tumours: ESMO–EURACAN Clinical Practice Guidelines for diagnosis, treatment and follow-up†

Management of local/locoregional disease (see Figure 1)

The standard treatment of localised GISTs is complete surgical excision of the lesion, with no dissection of clinically negative lymph nodes [III, A]. If laparoscopic excision is planned, the technique needs to follow the principles of oncological surgery [III, A] [15]. A laparoscopic approach is clearly discouraged in patients who have large tumours, because of the risk of tumour rupture, which is associated with a very high risk of relapse. R0 excision is the goal (i.e. an excision whose margins are clear of tumour cells). When R0 surgery implies major functional sequelae, and preoperative medical treatment is not effective, the decision can be made with the patient to accept possible R1 (microscopically positive) margins [IV, B]. This is even more acceptable for low-risk lesions, given the lack of any formal demonstration that R1 surgery is associated with a worse overall

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ANNALS OF ONCOLOGY driving innovation in oncology

SPECIAL ARTICLE

Gastrointestinal stromal tumours: ESMO—EURACAN—GENTURIS Clinical Practice Guidelines for diagnosis, treatment and follow-up☆

- For selected presentations (small tumours in the upper or lower GI tract), endoscopic excisions may be considered at sarcoma reference centres with experience in endoscopic surgery.

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Casali PG, et al. Ann Oncol. 2018 Oct 1;29(Suppl 4):iv68-iv78.
Casali PG, et al. Ann Oncol. 2022; 33: 20-33

Guideline

Thieme

Endoscopic management of subepithelial lesions including neuroendocrine neoplasms: European Society of Gastrointestinal Endoscopy (ESGE) Guideline

ESGE

RECOMMENDATION

ESGE suggests considering removal of histologically proven gastric GISTs smaller than 20 mm as an alternative to surveillance. The decision to resect should be discussed in a multidisciplinary meeting. The choice of technique should depend on size, location, and local expertise.
Weak recommendation, very low quality evidence.

RECOMMENDATION

In the presence of an indication for resection, ESGE suggests considering ER (either STER, endoscopic submucosal excavation [ESE], or EFTR) as an alternative to laparoscopic gastric wedge excision for removing a gastric GIST <35 mm in size and protruding into the gastric lumen, with a multidisciplinary meeting beforehand.
Weak recommendation, very low quality evidence.

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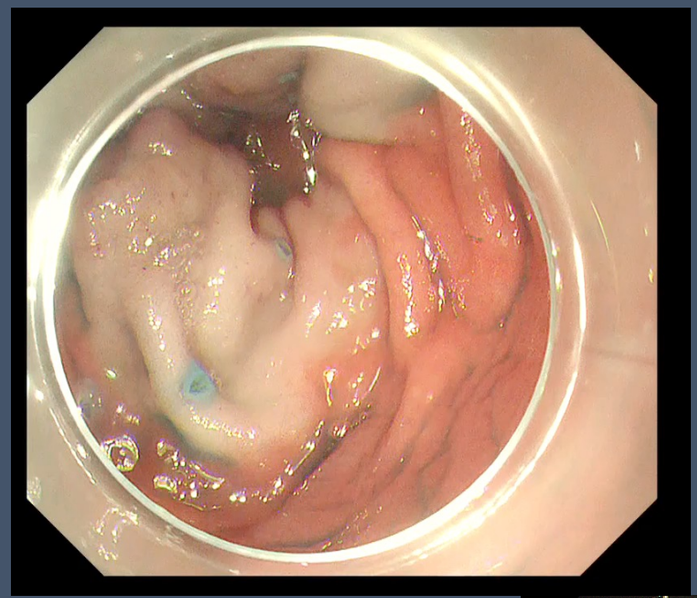
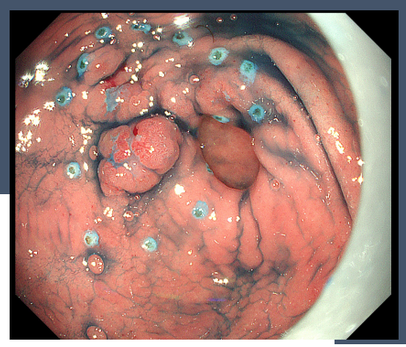
Deprez PH, et al. Endoscopy. 2022 Apr;54(4):412-429.

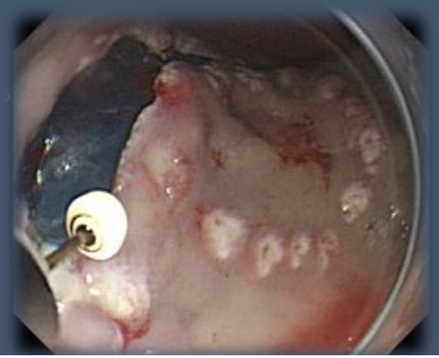
Endoscopic submucosal dissection (ESD) – revolution of endoscopic resection in early 2000

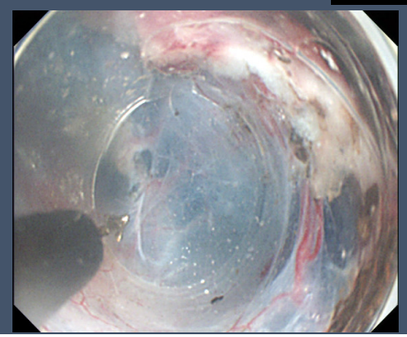
Ono et al. Gut 2001; 48 : 225-9

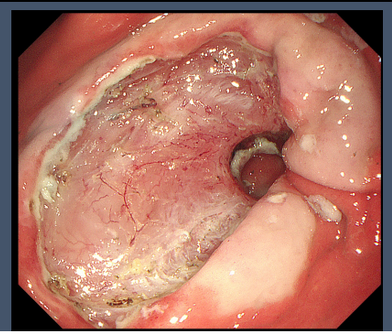
- En-bloc resection of gastric mucosal tumor
- Dedicated special ESD devices
  - IT knife, Dual knife, TT knife, etc
- Technique quickly expanded to esophageal, colorectal lesions

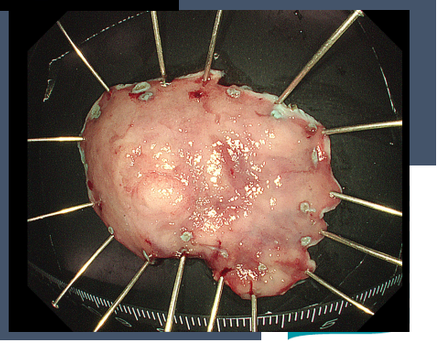






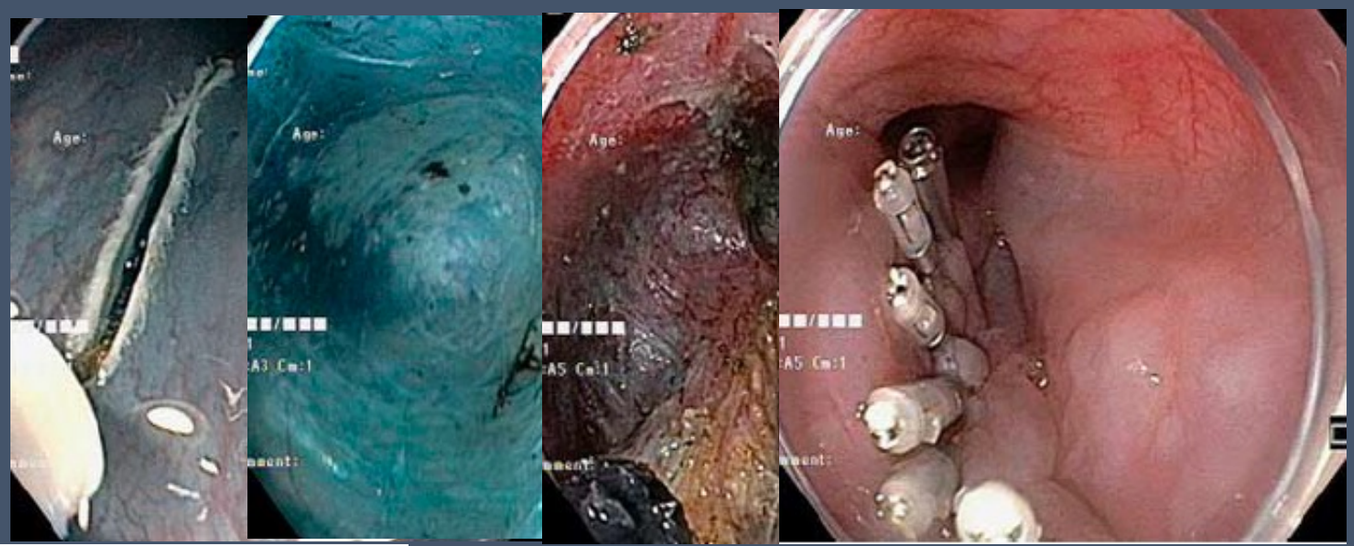


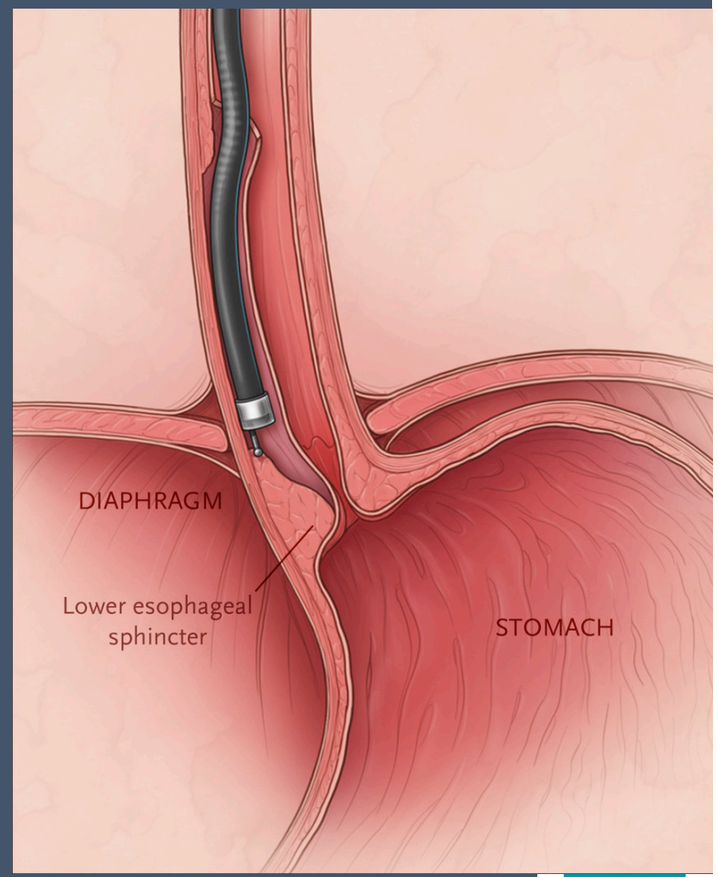




Per-oral endoscopic myotomy (POEM) for achalasia

- The first application of submucosal endoscopy
- Animal study reported in 2007, first human report in 2010
- 5cm esophageal myotomy + 2cm gastric myotomy (Longer myotomy depending on subtype)
- Closure of mucosal incision





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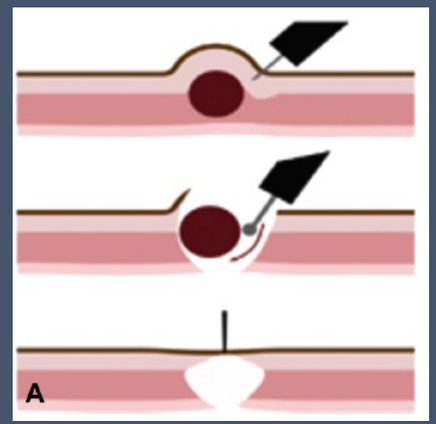
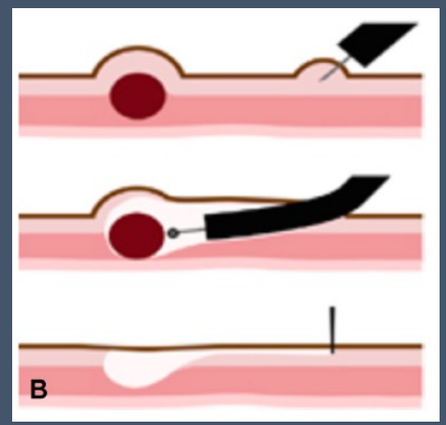
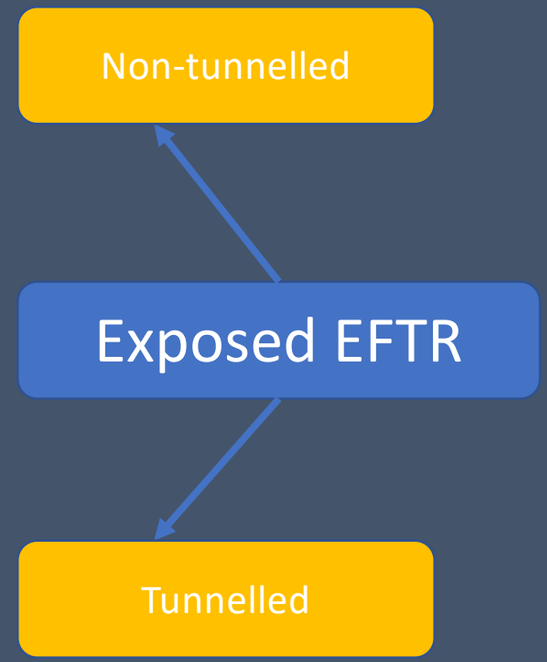
Pasricha PJ, et al. Endoscopy. 2007;39:761–764.
Inoue H, Minami H, et al. Endoscopy. 2010;42:265–271.
Werner Y.B, et al. N Engl J Med 2019; 381:2219-2229

Types of endoscopic resection for gastric SET

- Endoscopic full thickness resection (EFTR)
- Submucosal tunnelling endoscopic resection (STER) / Per-oral endoscopic tunnelling resection (POET)
- Endoscopic submucosal excavation (ESE)
- Full-thickness resection device (FTRD)







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ASGE Technology Committee. VideoGIE. 2019 Jun 29;4(8):343-350.

Considerations on endoscopic resection of gastric SET (especially GIST)

1. Case selection
   - Technical feasibility and difficulty
   - Advantage over other methods such as laparoscopic resection / LECS

2. Selection of endoscopic resection method

3. Selection of method to achieve water-tight secure defect closure

4. Perioperative and oncological outcomes

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Case selection

- Pre-operative workup

1. OGD
2. EUS (+/- contrast enhancement)
3. CT scan with contrast

- EUS guided FNB maybe performed in lesions larger than 2cm for pre-op confirmation
- Low yield of FNB if lesion <2cm

Location	• Easy to access by endoscopy, such as gastric body (Lesser and greater curvature), antrum, cardia • Potential difficult location for laparoscopic wedge resection, e.g. cardia, prepyloric antrum, lesser curvature / angularis
Size	• Generally <3.5cm should be technically retrievable via the oral route • Depends also on the shape of the lesion (The shortest axis diameter)
Morphology	• Endophytic lesion vs exophytic lesion: The more intraluminal component the better • Absent of high risk features on pre-op imaging • Non-ulcerated

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Potential advantage of endoscopic resection over laparoscopic techniques

- No need abdominal incisions
  - Potential reduction of wound pain
- Resection of minimal amount of “normal gastric tissue”
  - Less gastric deformity
  - Ability to resect lesions at cardia / prepyloric region
- No need dissect excessive lesser / greater curve arcade
  - ? Reduction in gastric functional outcome loss

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Type of endoscopic resection

EFTR

- High complete excision rate
- Suitable for almost all gastric locations
- Potential risk of full thickness defect and spillage/contamination
- Difficulty in closure of resultant defect

STER

- Easy and secure closure of mucosal entrance, no full thickness defect
- Tunnelling not possible in some gastric location
- Difficult tumor retrieval from tunnel opening if large size
- Close resection margins

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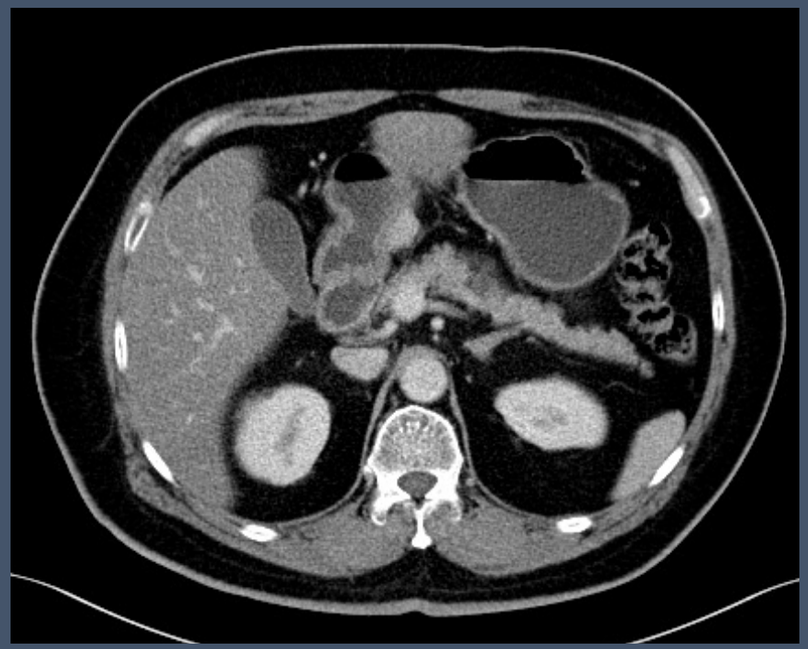
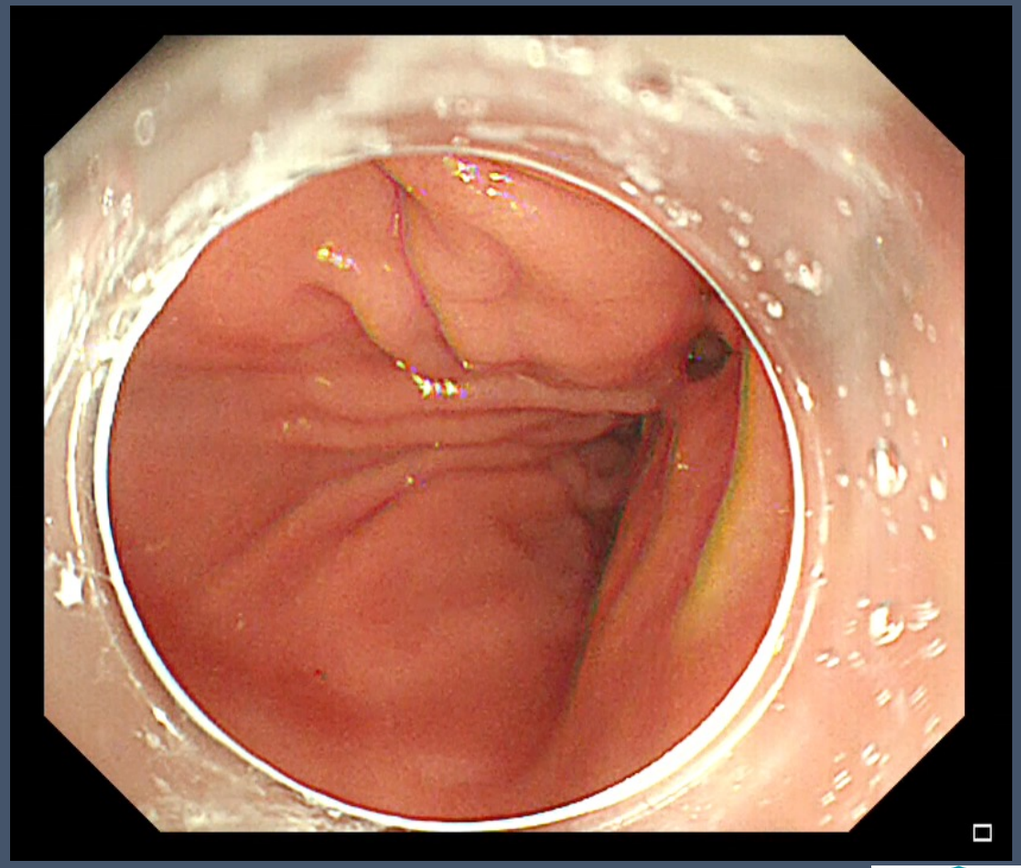
EFTR of gastric SET

- 2cm distal body SET, incidental finding on CT





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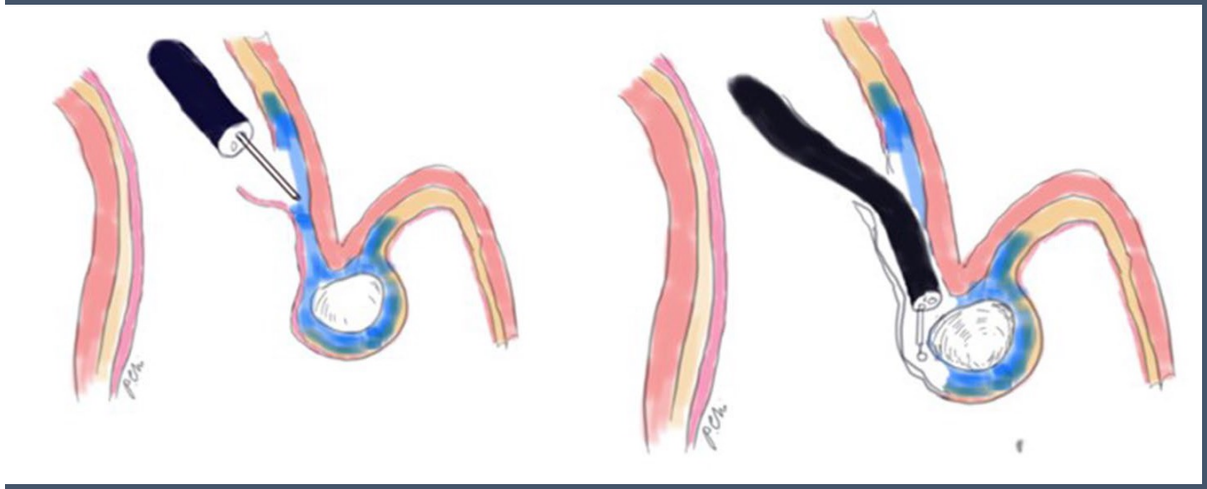
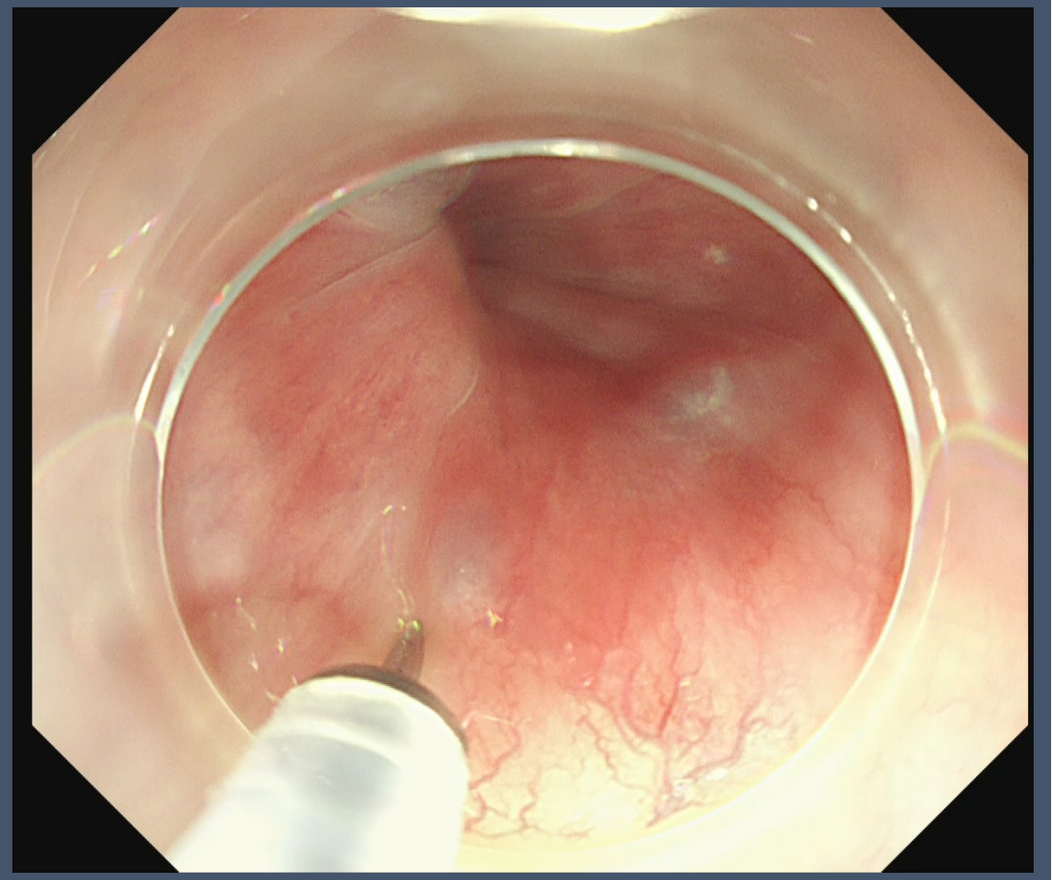
Submucosal tunnel resection of cardia GIST





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Closure of full thickness defect

- Simple clip closure
  - When mucosal preservation was successful
- Clip closure with omental patch
- Over-the-scope clip (OTSC)
- Clip-loop purse string technique
- Endoscopic “suturing” methods

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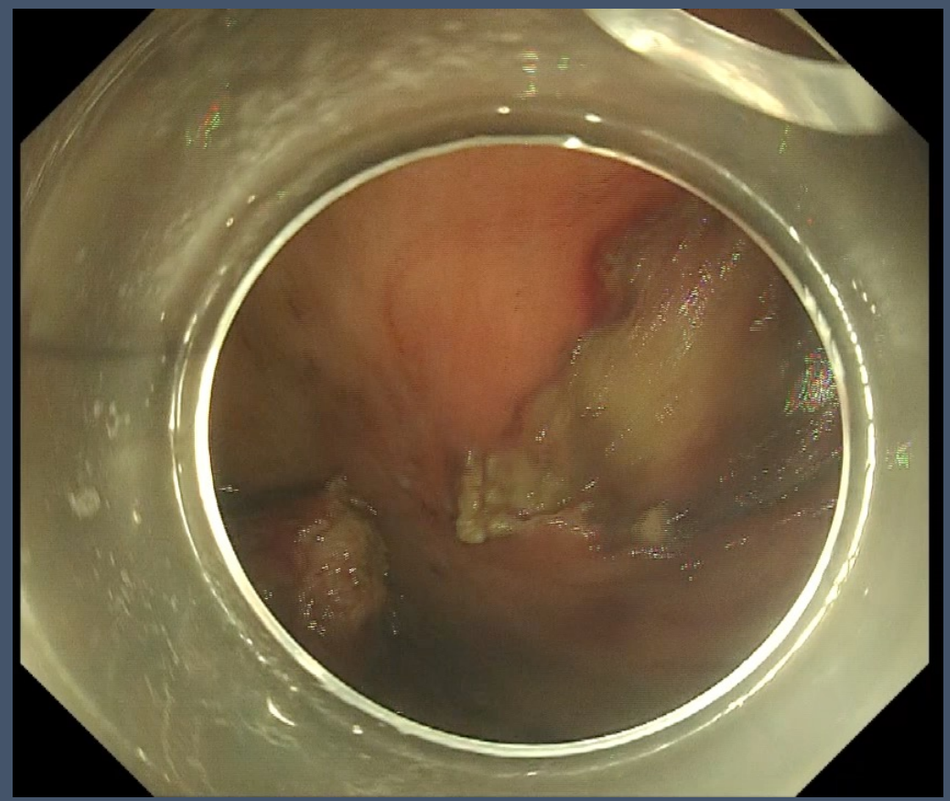
Closure of full thickness gastric defect

- Closure with clip + detachable loop purse string technique



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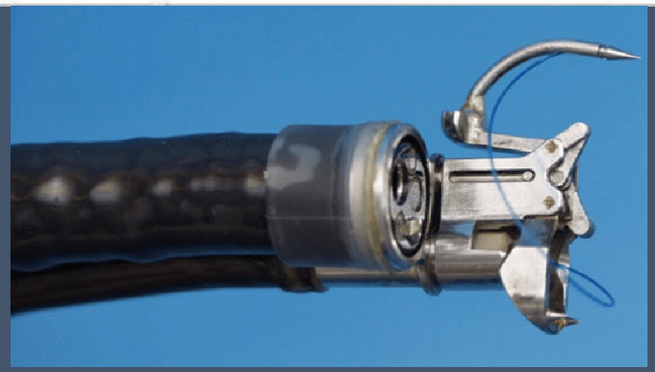
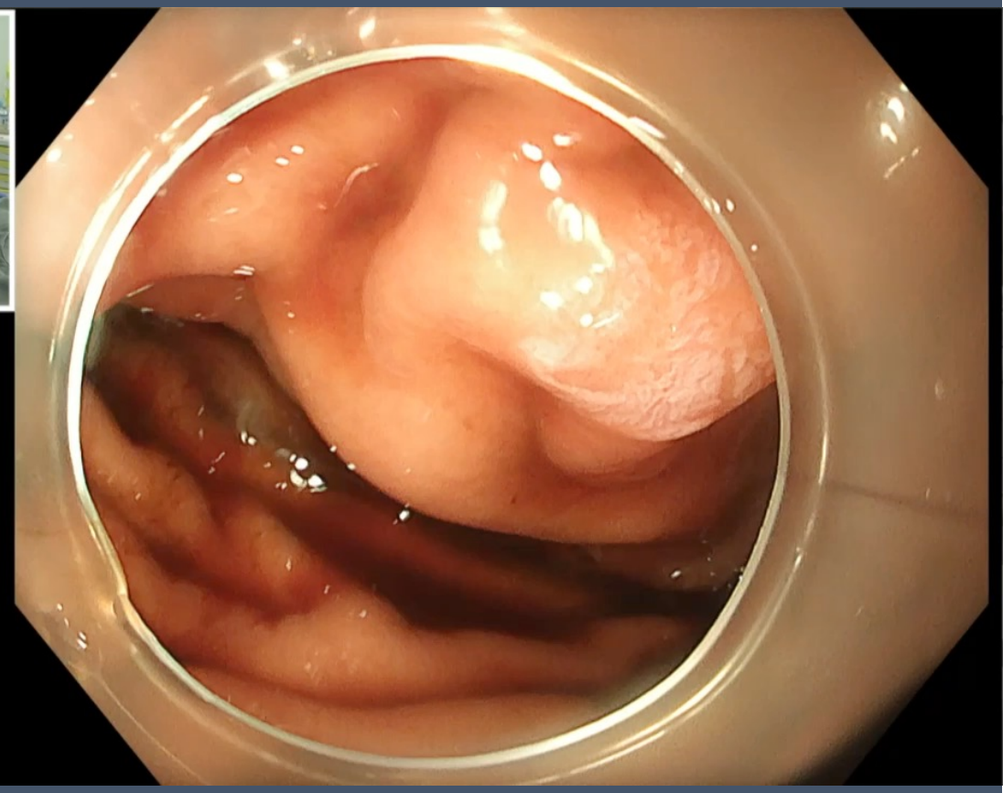
Closure of EFTR defect by endoscopic suturing device (Overstitch™)





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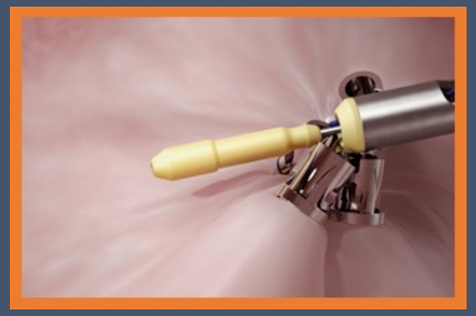
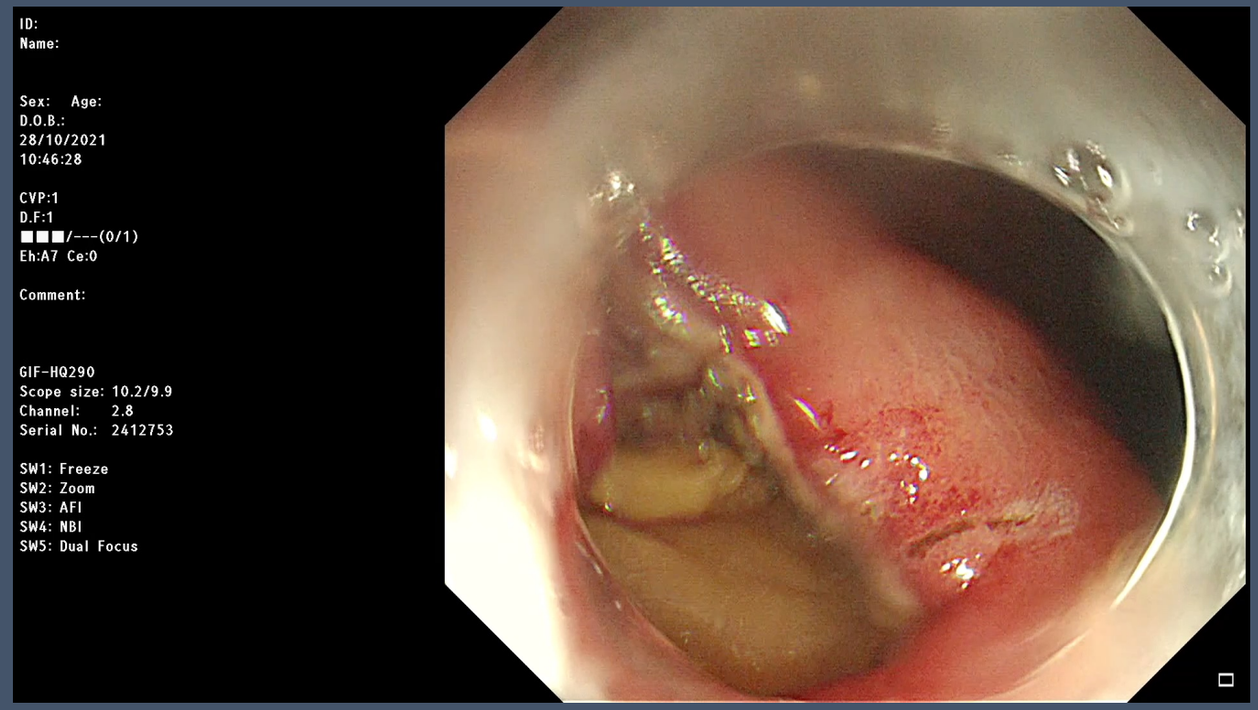
Endoscopic closure device
X-Tack Endoscopic HeliX Tacking System





Ong L, Chan SM, Yip HC et al, presented in ELSA 2021

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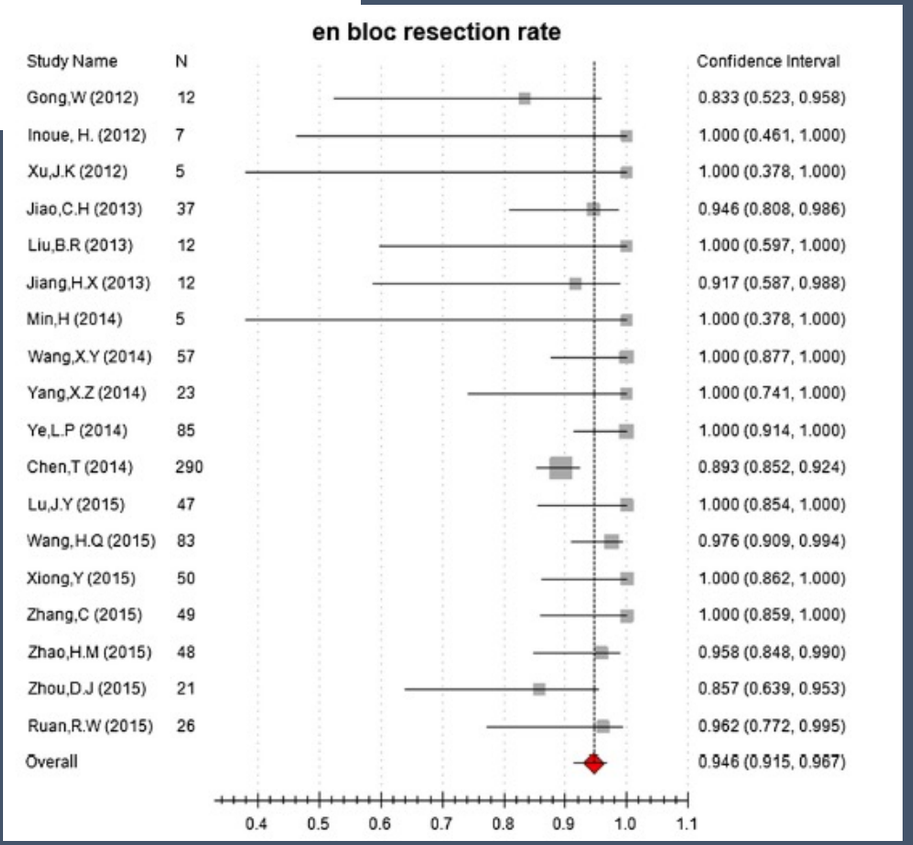
Outcomes of POET – meta-analysis

Efficacy and safety of submucosal tunneling endoscopic resection for upper gastrointestinal submucosal tumors: a systematic review and meta-analysis

Xiu-He Lv[1] · Chun-Hui Wang[1] · Yan Xie[1]

- Meta-analysis of 28 studies
  - 1041 patients, 1085 lesions
  - En-bloc resection 94.6%
  - Complications:
    - Subcutaneous emphysema / pneumomediastinum – 14.8%
    - Pneumoperitoneum – 6.8%
    - Perforations - 5.6%
    - Bleeding - rare



Lv X.-H, et al. Surg Endosc (2017) 31:49–63

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Outcomes of gastric exposed EFTR – systematic review

N=750

Reference	Lesions, n	Mean tumor size (range), cm	Location (cardia/antrum/body/fundus)	Layer of origin	Histological diagnosis (GIST/leiomyoma/schwannoma/others)	Countertraction method use	Suture technique	Mean procedure time (range), min
Zhou et al. [10]	26	2.80 ± 1.30 (1.20–4.50)	0/0/14/12	MP	16/6/1/3	no	Clips	105 (60–145)
Shi et al. [11]	20	1.47 ± 0.87 (0.40–3.00)	0/1/7/12	MP	12/4/2/2	no	EMCIS	–
Ye et al. [12]	51	2.40 ± 0.73 (1.30–3.50)	0/1/22/28	MP	30/21/0/0	no	Clips and endoloop	52 (30–125)
Feng et al. [22]	48	1.59 ± 1.01 (0.50–4.80)	0/1/7/40	MP	43/4/1/0	no	Clips	59.7 (30–270)
Dong et al. [23]	10	1.65 ± 0.59 (0.80–2.50)	1/1/1/7	MP	10/0/0/0	no	Clips	120 (60–180)
Wu et al. [24]	50	3.40 ± 0.83 (2.50–5.00)	0/13/23/14	MP	–	no	Clips	85 (55–155)
Yang et al. [25]	41	1.63 ± 5.89 (–)	0/3/25/13	–	33/4/1/3	no	Clips (n = 35); OTSC (n = 6)	78.8 (–)
Lu et al. [26]	62	2.23 ± 1.80 (0.60–6.00)	0/0/29/33	–	44/17/1/0	not-assisted (n = 30) vs thread-with-clip (n = 21) vs loop-assisted (n = 11)	Clips	85 (40–180) vs 45 (25–90) vs 40 (30–75)
Shi et al. [27]	68	2.60 ± 0.50 (2.00–3.50)	0/0/0/68	MP	68/0/0/0	no	Clips and endoloops	41 (23–118)
Hu et al. [28]	13	1.50 ± 1.00 (0.50–3.50)	0/0/2/11	MP	11/2/0/0	no	GAL	43.5 (20–80)
Sun et al. [29]	69	2.25 ± 1.40 (0.60–6.00)	3/9/17/40	MP	59/7/1/2	no	Clips or clips and endoloops	128.7 (17–600)
Abe et al. [30]	14		–	MP	–	no	Clips	–
Wu et al. [31]	25	1.70 ± 1.00 (0.50–4.50)	0/0/7/18	MP	21/2/0/2	no	p-EPSS	31 (–)
Zhang et al. [32]	61	–	–	MP	–	no	Clips or nylon rope purse	–
Li et al. [33]	192	1.30 ± 9.8 (0.20–7.00)	0/0/0/192	MP	141/46/1/4	not-assisted (n = 128) vs DFC-assisted (n = 64)	clips (n = 90); EMCIS (n = 102)	54.2 (–) vs 44.2 (–)

GIST, gastrointestinal stromal tumor; MP, muscularis propria; EMCIS, endoloop and metallic clip interrupted-suture; OTSC, over-the-scope clip; GAL, grasp-and-loop; p-EPSS, prepurse-string suture; DFC, dental floss and a hemoclip.

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Antonino G, et al. Endosc Int Open. 2020 Sep;8(9):E1173-E1182.

Outcomes of gastric exposed EFTR – systematic review

Reference	Lesions, n	Complete resection	Surgical conversion	Successfull Eo-EFTR	Major AEs	Peritonitis, abdominal abscess or infection	Delayed perforation	Delayed bleeding	Complete resection, n	Mean follow-up (range), months	Recurrence, n
Zhou et al. [10]	26	26	0	26	0	0	0	0	26	8 (6–24)	0
Shi et al. [11]	20	20	0	20	0	0	0	0	20	6,8 (2–13)	0
Ye et al. [12]	51	50	1	50	0	0	0	0	50	22.4 (1–48)	0
Feng et al. [22]	48	48	0	48	0	0	0	0	48	– (2–24)	0
Dong et al. [23]	10	10	0	10	1	1	0	0	10	12.3 (4–20)	0
Wu et al. [24]	50	50	0	50	0	0	0	0	50	1 (1–1)	0
Yang et al. [25]	41	41	0	41	0	0	0	0	41	–	–
Lu et al. [26]	62	61	0	61	0	0	0	0	61	7,6 (2–24)	0
Shi et al. [27]	68	68	0	68	1	0	0	1	68	7 (3–13)	0
Hu et al. [28]	13	13	0	13	0	0	0	0	13	5 (1–15)	0
Sun et al. [29]	69	69	0	68	4	2	1	1	69	26 (7–84)	0
Abe et al. [30]	14	14	3	11	0	0	0	0	14	–	0
Wu et al. [31]	25	25	0	25	0	0	0	0	25	7 (1–11)	0
Zhang et al. [32]	61	59	2	59	6	4	0	2	59	–	0
Li et al [33]	192	187	0	187	0	0	0	0	187	35 (20–50)	0

- Complete resection rate: 98.8%
- Surgical conversion rate: 0.8%
- Overall AE: 1.6%

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Antonino G, et al. Endosc Int Open. 2020 Sep;8(9):E1173-E1182.

Safety and efficiency of endoscopic resection versus laparoscopic resection in gastric gastrointestinal stromal tumours: A systematic review and meta-analysis

Chao Wang [a, b], Zhidong Gao [b, **], Kai Shen [a], Jian Cao [a], Zhanlong Shen [a, b], Kewei Jiang [a, c], Shan Wang [c], Yingjiang Ye [a, *]

[a] Department of Gastrointestinal Surgery, Peking University People's Hospital, Beijing, 100044, PR China
[b] Laboratory of Surgical Oncology, Peking University People's Hospital, Beijing, 100044, PR China
[c] Beijing Key Laboratory of Colorectal Cancer Diagnosis and Treatment Research, Peking University People's Hospital, Beijing, 100044, PR China

- 12 studies, all retrospective in nature, 1292 patients

- Safety outcomes:
  - ER has shorter procedural time (SMD -1.48), less time to soft diet (SMD -1.02)
  - No difference in blood loss, hospital stay, postoperative complications

- Efficacy outcomes:
  - Higher positive margins with ER (RR 6.32)
  - No difference in recurrence / 5 year DFS

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Wang C, et al. Eur J Surg Oncol. 2020 Apr;46(4 Pt A):667-674.

Conclusion

- Endoscopic resection has emerged as an alternative option of treatment of gastric GIST
- Careful selection of suitable cases could ensure safe and equivalent oncological outcomes
- Ongoing development and refinement of endoscopic techniques may further expand indications of ER for gastric GISTs

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Thank you

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