



Beneath the Surface: Decoding (Submucosal) Subepithelial GI Lesions



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10/2025



Case

- 45yo male with dysphagia and no other significant past medical history undergoes EGD.
- EGD unremarkable other than this gastric subepithelial nodule.



- What are next best steps?

Subepithelial Lesions Throughout GI Tract

Upper GI > colon

1% EGD

29%



59%



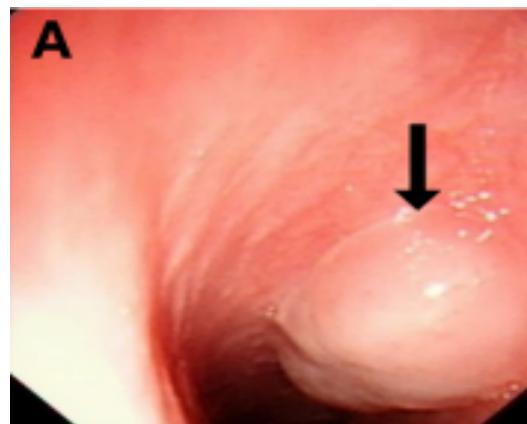
12%



Subepithelial Lesions: Esophagus

Esophagus

- 66-77% Leiomyoma
- 13% Granular cell tumor
- 5% Lymphangioma
- 1% Cyst
- 1% Lipoma



Chen Y et al. BMC Gastro 2019.

Subepithelial Lesions: Stomach

Stomach

54% GIST

16% Pancreatic rest

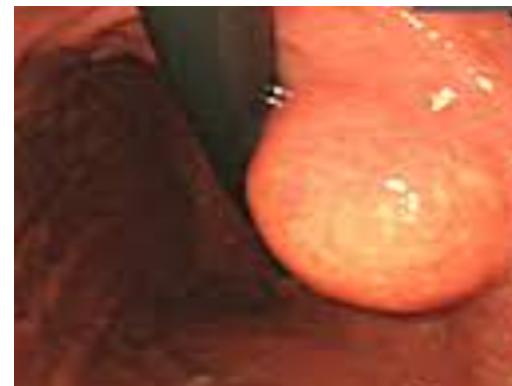
9% Cyst

5% Lipoma

3% Neuroendocrine tumor

1% Granular cell tumor

1% Lymphangioma



Subepithelial Lesions: Duodenum

Duodenum

19% Cyst

19% Brunner's gland hyperplasia

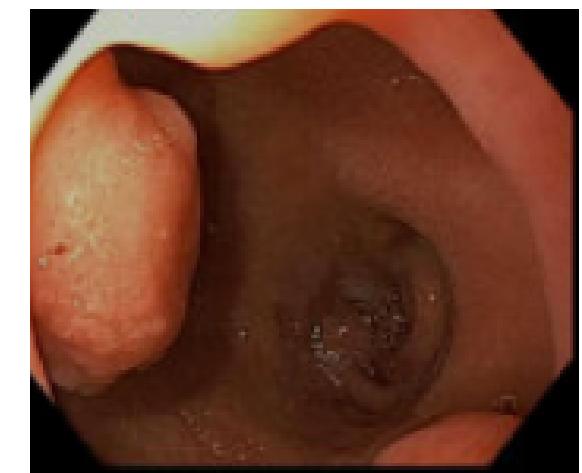
17% Neuroendocrine tumor

17% GIST

14% Lipoma

2% Pancreatic rest

2% Lymphangioma



Tang J et al. GIE 2016

Subepithelial Lesions: Rectum

Rectum

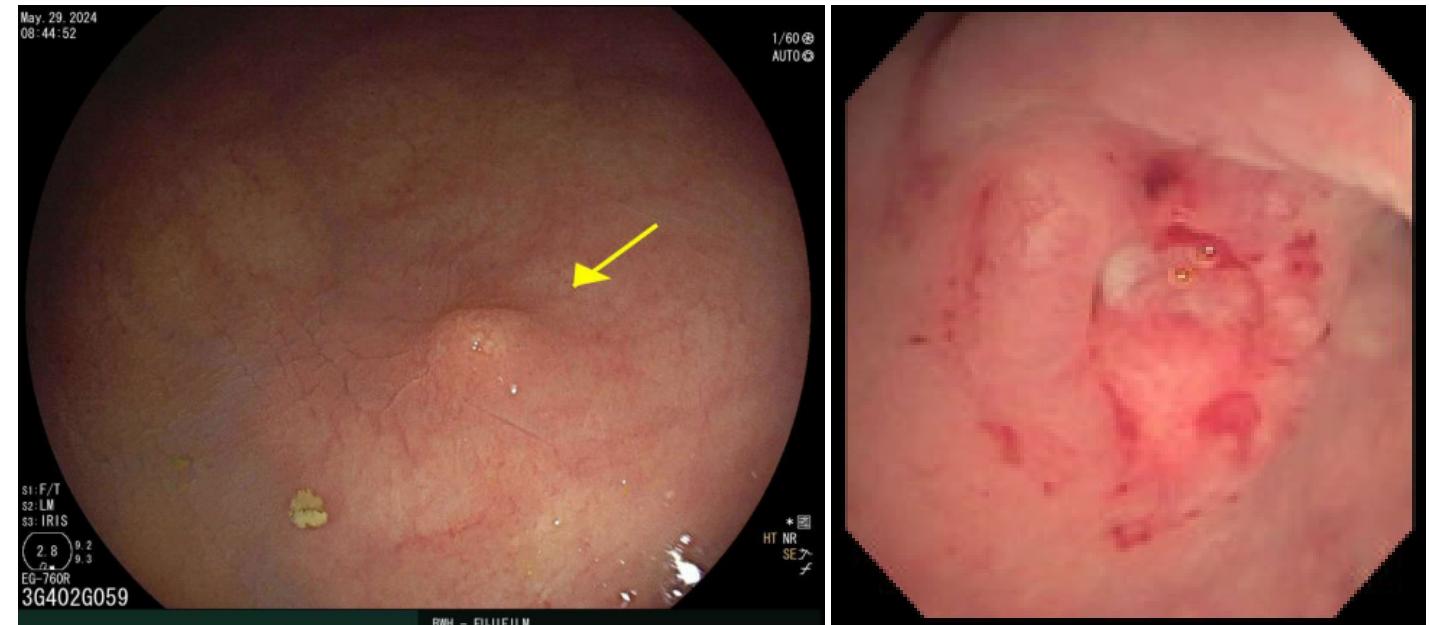
43% Neuroendocrine tumor

14% Lipoma

13% Lymphangioma

7% GIST

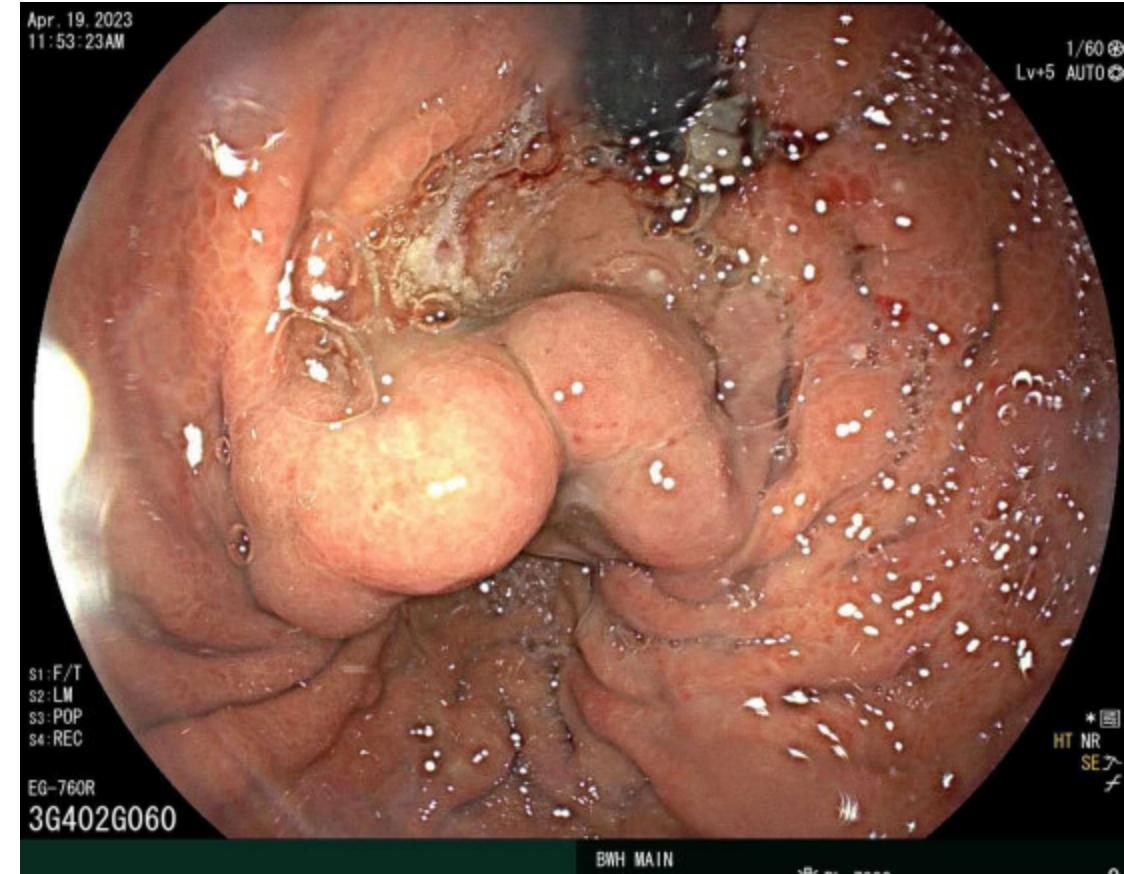
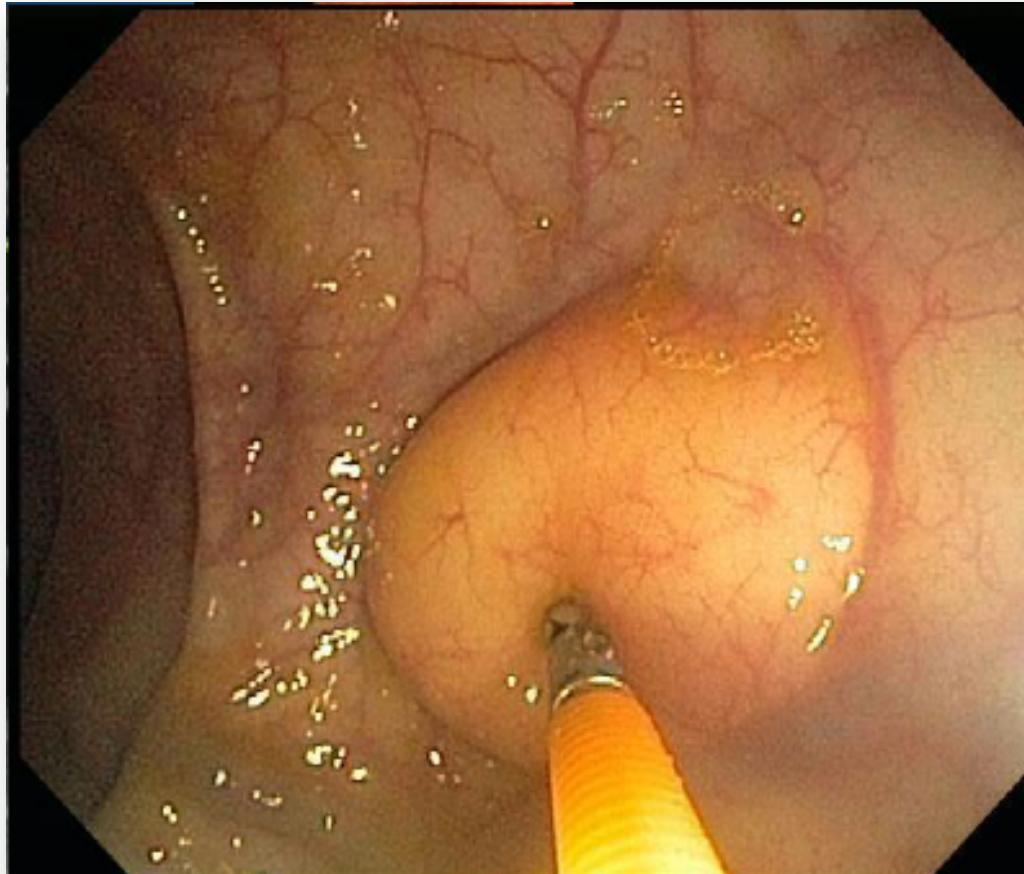
7% Leiomyoma



Approach to Incidental Subepithelial Lesions

- Concern: Malignant potential
- Try to diagnose to offer appropriate management
- During initial EGD/ colonoscopy, assess for features of lipoma, cyst, varices.
- If unsure of diagnosis, do EUS

Lipoma, Gastric Varices



ACG Guideline: Diagnosis of Subepithelial Lesions

- We suggest EUS be performed preferentially compared with endoscopy and contrast-enhanced cross-sectional imaging for the diagnosis of nonlipomatous SEL (Conditional recommendation; very low quality of evidence)
- We do not suggest bite-on-bite biopsies in the evaluation of SEL before EUS (Conditional recommendation; very low quality of evidence)

ACG Guideline: Diagnosis of Subepithelial Lesions

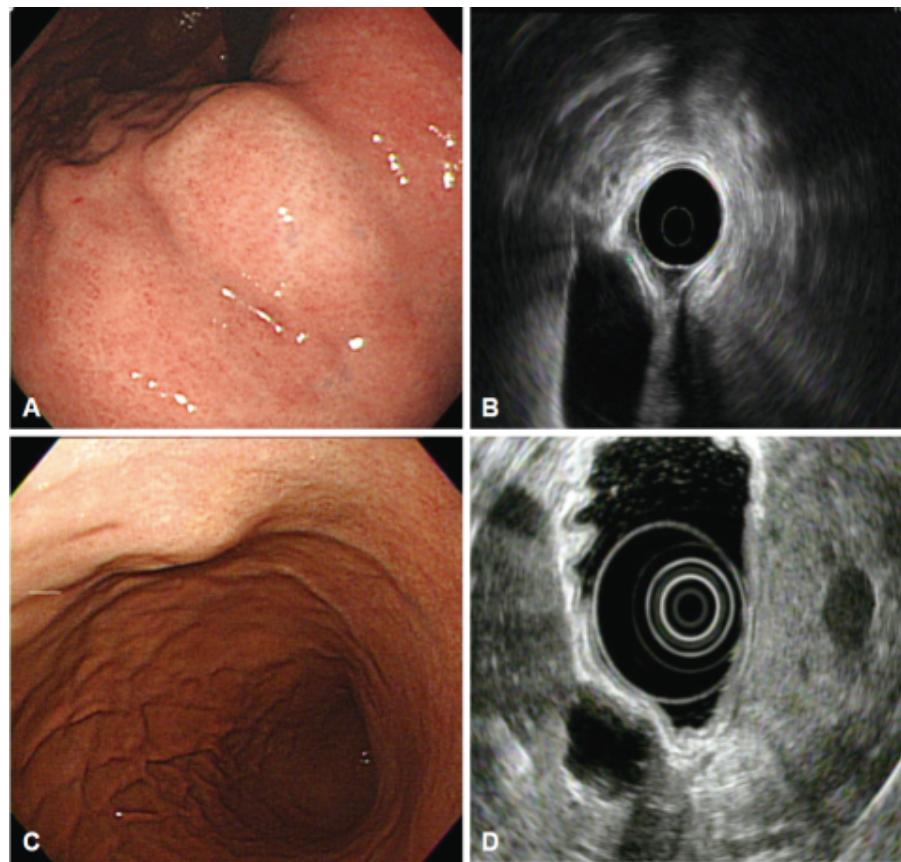
- We do not recommend one type of echoendoscope (forward viewing vs oblique viewing) when evaluating SEL (strong recommendation; low quality of evidence)



Jacobson BC et al. AJG 2023

Extrinsic Compression

- Up to 1/3



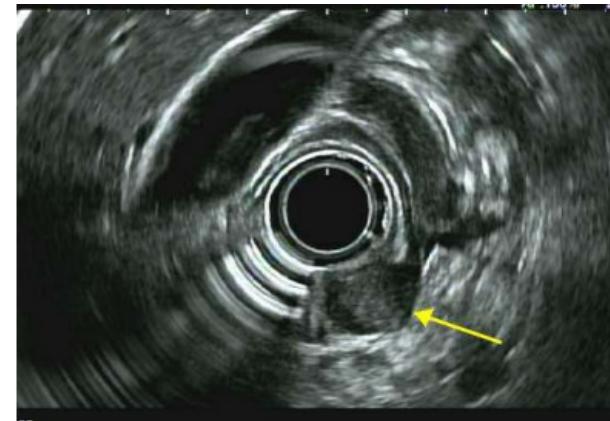
Suzuki R and Bhutani M. GIE 2013
Gong EJ, Kim DH. Clin Endosc 2016.

EUS Diagnosis of Subepithelial Lesions



Case

- 45yo male with dysphagia and no other significant past medical history undergoes EGD.
- EGD unremarkable other than this gastric subepithelial nodule.



- What are next best steps?

ACG Guideline: Diagnosis of Subepithelial Lesions

- We suggest EUS with tissue acquisition to improve diagnostic accuracy in the identification of solid nonlipomatous SEL (Conditional recommendation; very low quality of evidence)

EUS Imaging of Subepithelial Lesions

	Layer			Echotexture
	M. mucosa	Submucosa	M. propria	
GIST	✓	✓	✓	Hypoechoic
Leiomyoma	✓		✓	Hypoechoic
Lipoma		✓		Hyperechoic
Neuroendocrine tumor	✓	✓		Hypoechoic
Pancreatic rest	✓	✓	✓	Hypoechoic, anechoic ducts
Cyst	✓	✓	✓	Anechoic
Granular cell tumor	✓	✓		Hypoechoic, heterogeneous
Lymphangioma		✓		Anechoic with septa
Schwannoma		✓	✓	Hypoechoic
Varices		✓		Anechoic, courses along

EUS Imaging of Subepithelial Lesions

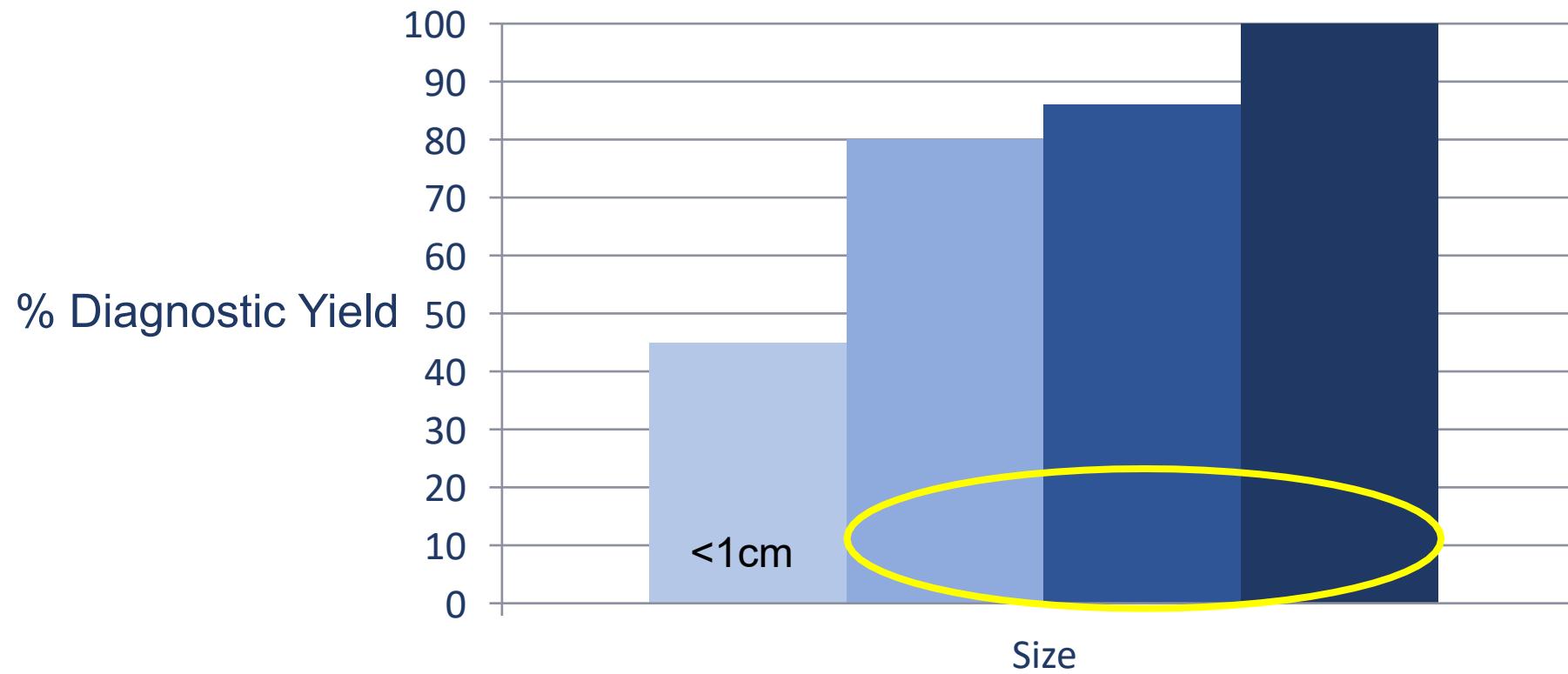
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ACG Guideline: Diagnosis of Subepithelial Lesions

- We suggest EUS-FNB alone or EUS-FNA with ROSE sampling of solid nonlipomatous SEL compared with EUS-FNA without ROSE (Conditional recommendation; low quality of evidence)
- Key concept: There is no fixed cutoff in size below which FNA/FNB may not be attempted. Small SEL should be managed on a case-by-case basis depending on the location, ease of sampling, clinical history, perceived risks and benefits of a surveillance approach, and potential for primary endoscopic resection.

Technique of EUS Tissue Acquisition

Size Matters

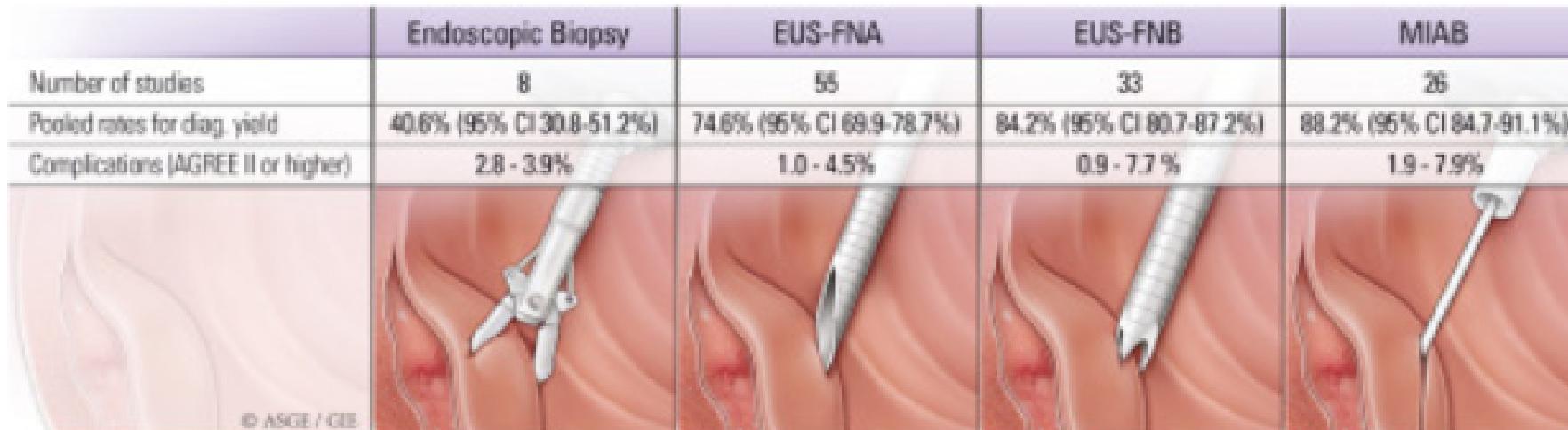


Hoda KM et al. GIE 2009; Beshir A et al. GIE 2014; Rong L et al. Dig Endosc 2012;
Akahoshi K et al. World J GI 2007; Joo DC et al. Surg Endo 2022; Nagai K et al. EUS 2021

ACG Guideline: Diagnosis of Subepithelial Lesions

- We suggest using an unroofing technique when a preresection definitive diagnosis of a SEL is necessary and when EUS-FNA or FNB is nondiagnostic (Conditional recommendation; low quality of evidence)

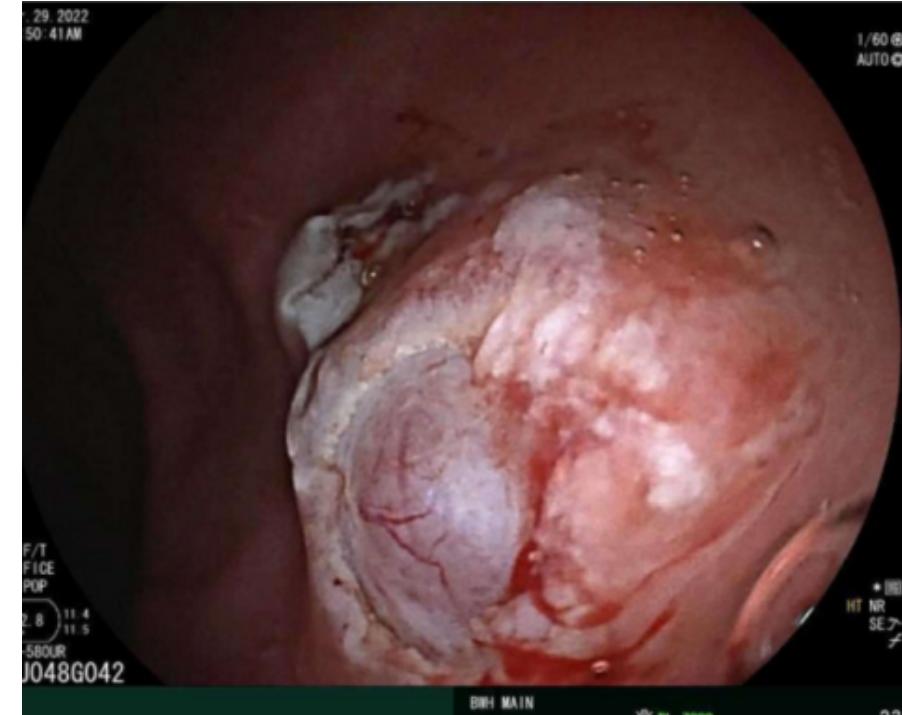
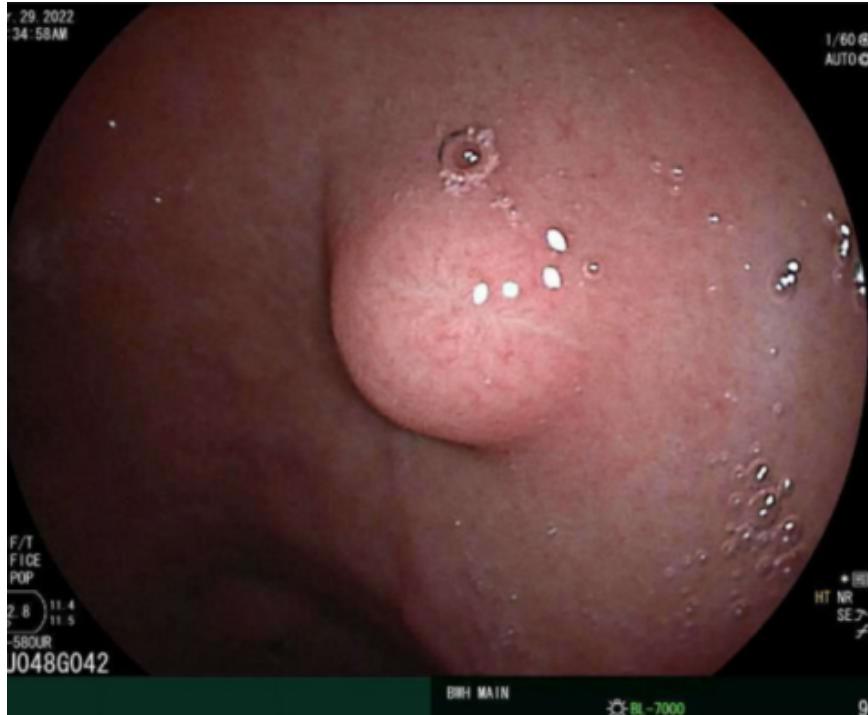
	Endoscopic Biopsy	EUS-FNA	EUS-FNB	MIAB
Number of studies	8	55	33	26
Pooled rates for diag. yield	40.6% (95% CI 30.8-51.2%)	74.6% (95% CI 69.9-78.7%)	84.2% (95% CI 80.7-87.2%)	88.2% (95% CI 84.7-91.1%)
Complications (AGREE II or higher)	2.0 - 3.9%	1.0 - 4.5%	0.9 - 7.7%	1.9 - 7.9%



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Jacobson BC et al. AJG 2023; Verloop C et al. GIE 2024

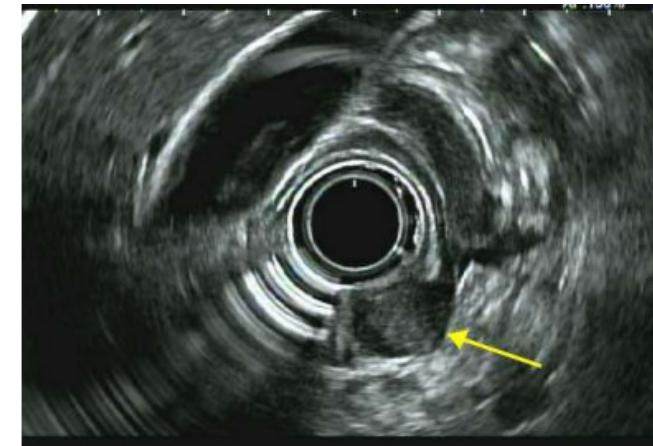
Mucosal Incision-Assisted Biopsy/ Unroofing Techniques



Diagnostic yield 90-96%
Complications up to 5.7%
Maybe preferred in small SELs

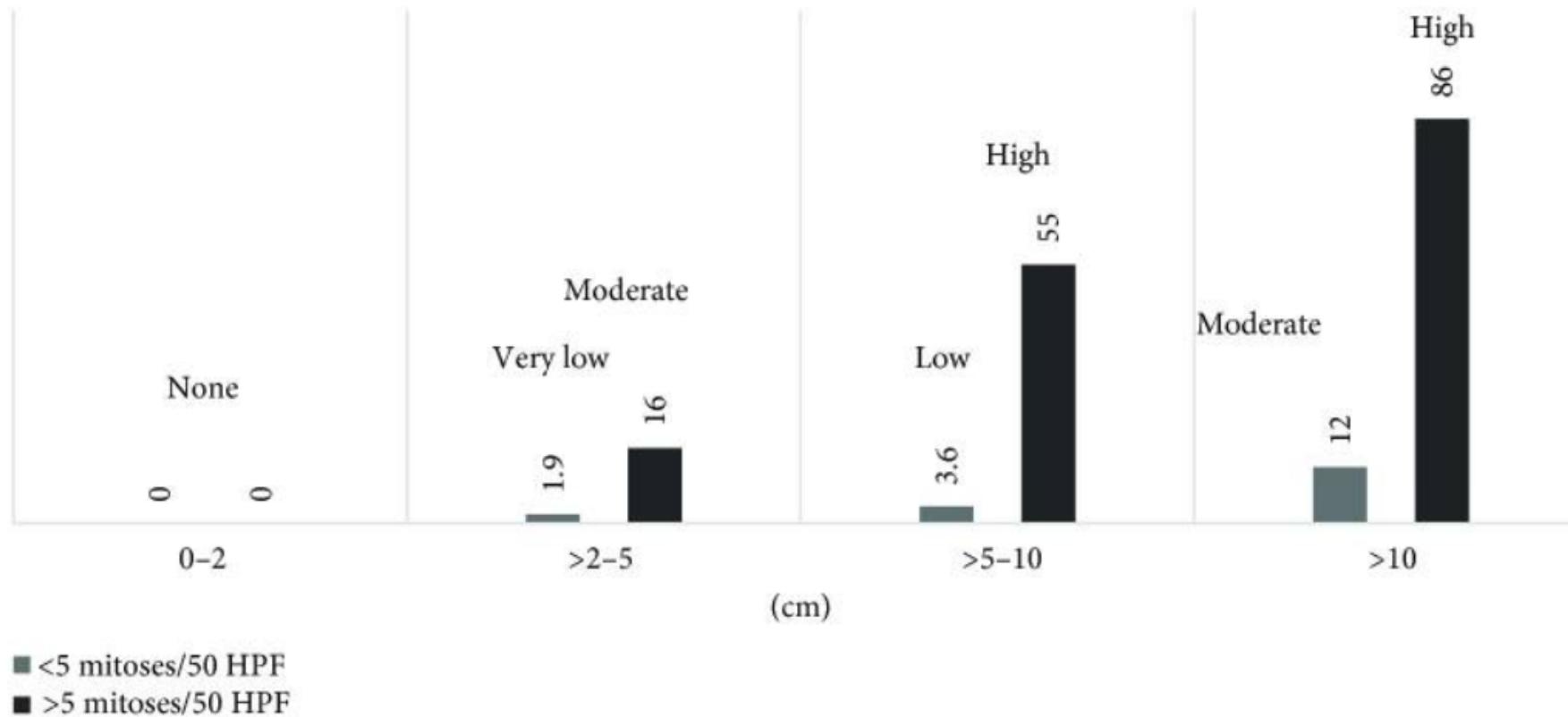
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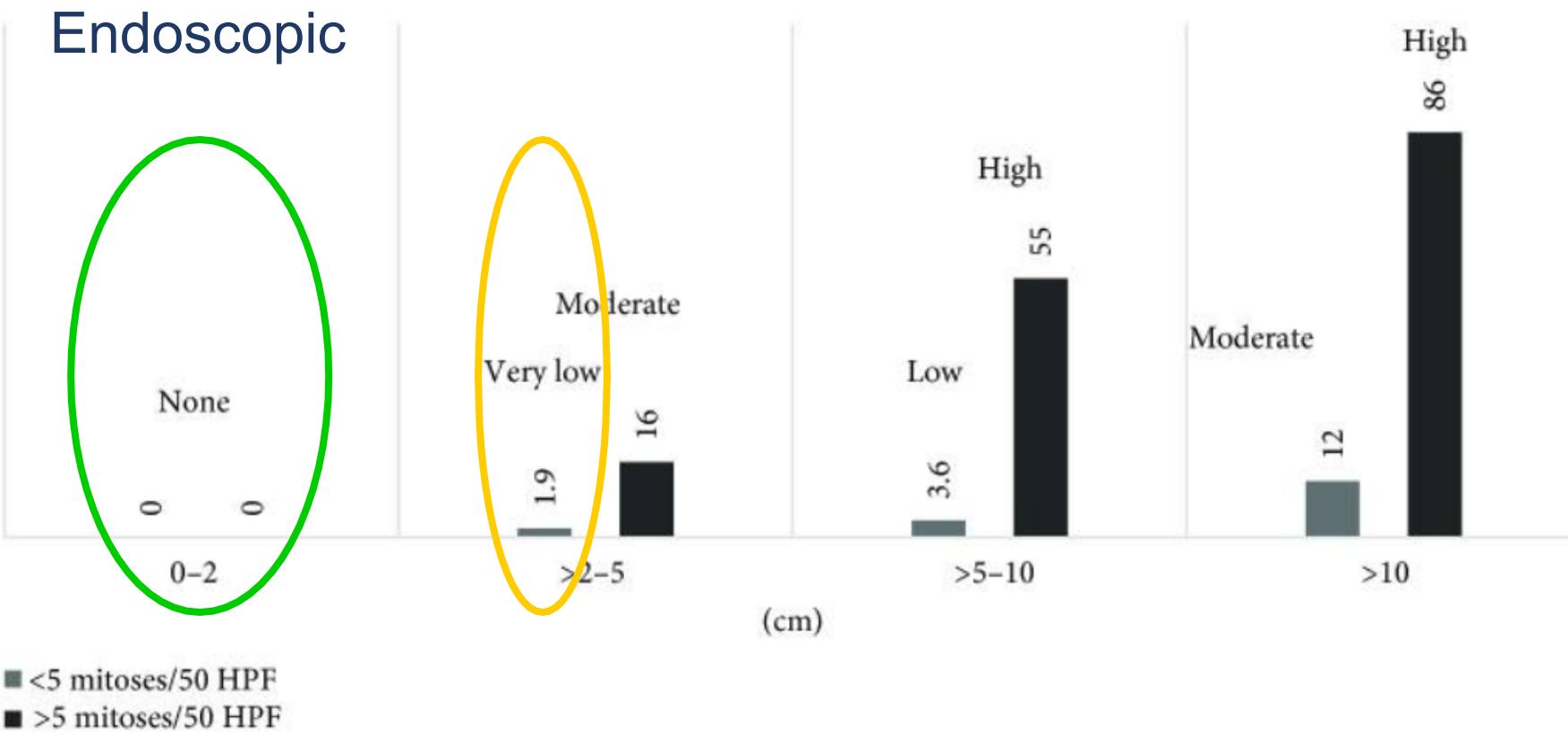
GIST

Risk of Malignancy in Gastric GISTs



Marcella C et al. Gastro Res Pract 2018

Risk of Malignancy in Gastric GISTs



Marcella C et al. Gastro Res Pract 2018

ACG Guideline: Treatment of Subepithelial Lesions

- There is insufficient evidence to recommend surveillance vs resection of gastric GIST <2 cm in size. Owing to their malignant potential, we suggest resection of gastric GIST >2 cm and all nongastric GIST. (Conditional recommendation; very low quality of evidence)

Gastric GIST < 2cm

- Surveillance

- ❖ No high-risk features:
EGD/EUS qyear



- Resection:

- ❖ Irregular margin, cystic spaces, calcifications, heterogeneous, ulceration

- Endoscopic or surgical



Cost, procedure time,
blood loss, LOS



Larger/ exophytic
lesions

Long term recurrence?

Deprez P et al. Endo 2022; Meng Y et al. J Gastro Hep 2017.

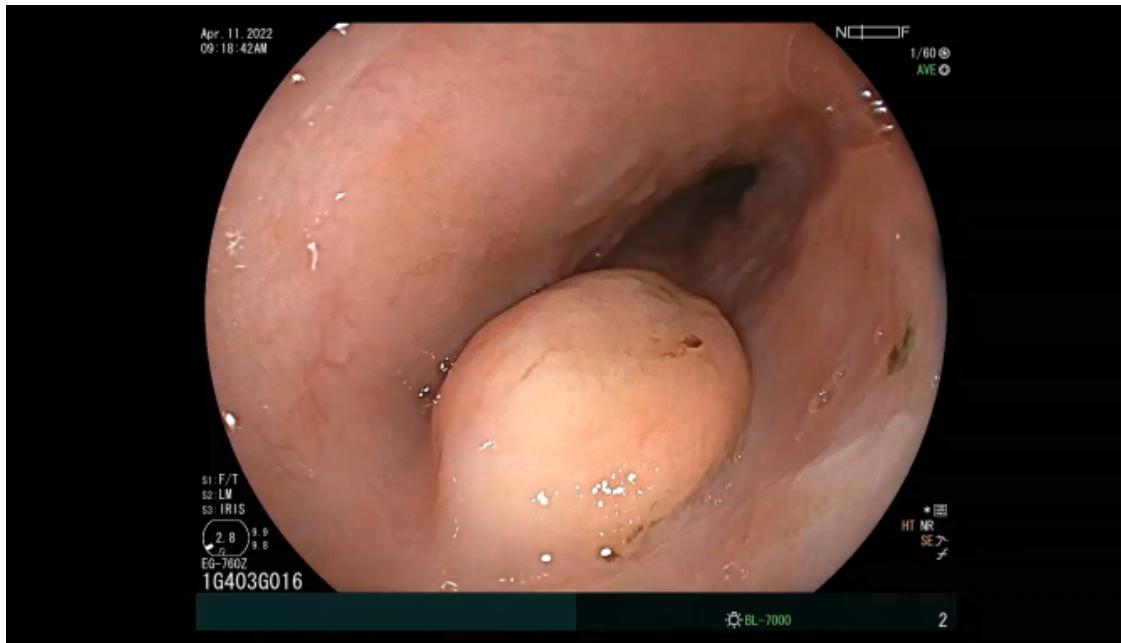
ACG Guideline: Treatment of Subepithelial Lesions

- Key concept: For GIST <2 cm, if the clinical decision is to resect, endoscopic methods may be considered as acceptable alternative therapies compared with surgery. There is insufficient data to suggest any one endoscopic method as superior.
- We suggest either STER or surgical resection for the management of SEL originating from the muscularis propria layer of the esophagus and GE junction when resection is necessary. (Conditional recommendation; very low quality of evidence)

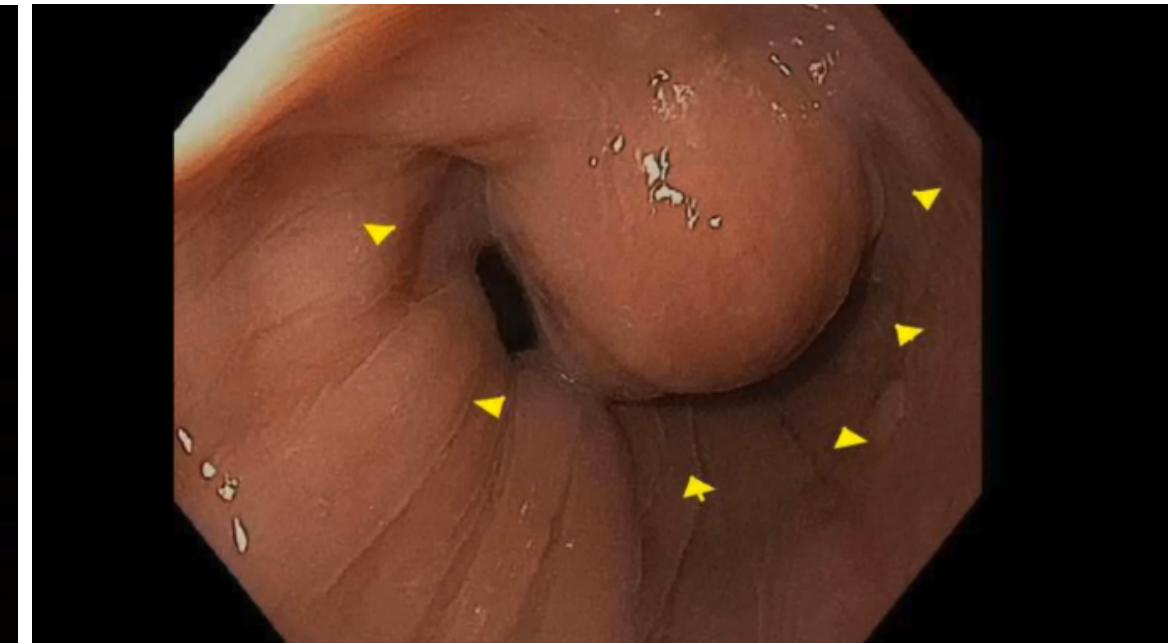
Endoscopic Resection

ESD/ ESE

*Videos Courtesy Dr. Hiro Aihara
Brigham and Women's Hospital*



STER



ESE ~ STER efficacy (~91-5%) and adverse events (~6% perforation)
ESE faster
STER for larger (1-4cm) lesions

Neto F et al. Surg Endosc 2021; Lu J et al. Surg Endosc 2014; Kim H. World J GIE 2015; Ye L et al. Surg Endo 2014; Meng Y et al. J Gastro Hep 2017; Lu J et al. Surg Endosc 2014; Lv HX et al. Surg Endo 2017

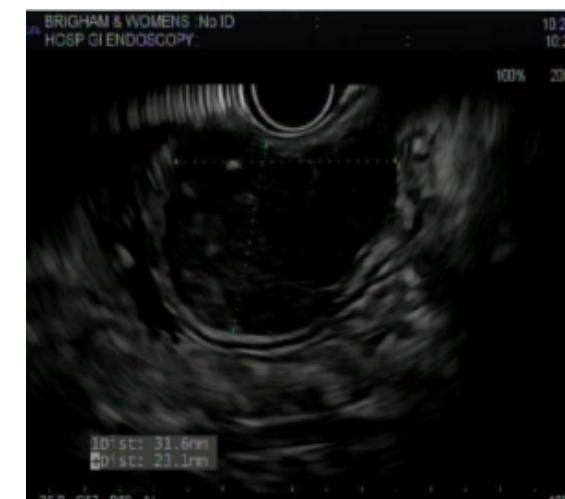
Leiomyoma

- Asymptomatic leiomyomas:

❖ Large: Resect



❖ Small: No surveillance or periodic surveillance



Forlemu AN et al. *Cureus* 2020; Deprez PH et al. *Endosc* 2022

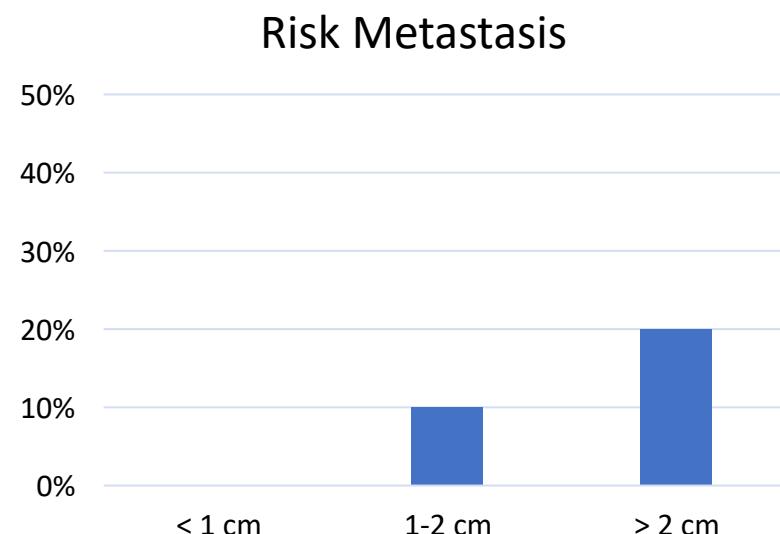
Neuroendocrine Tumors

ACG Guideline: Treatment of Subepithelial Lesions

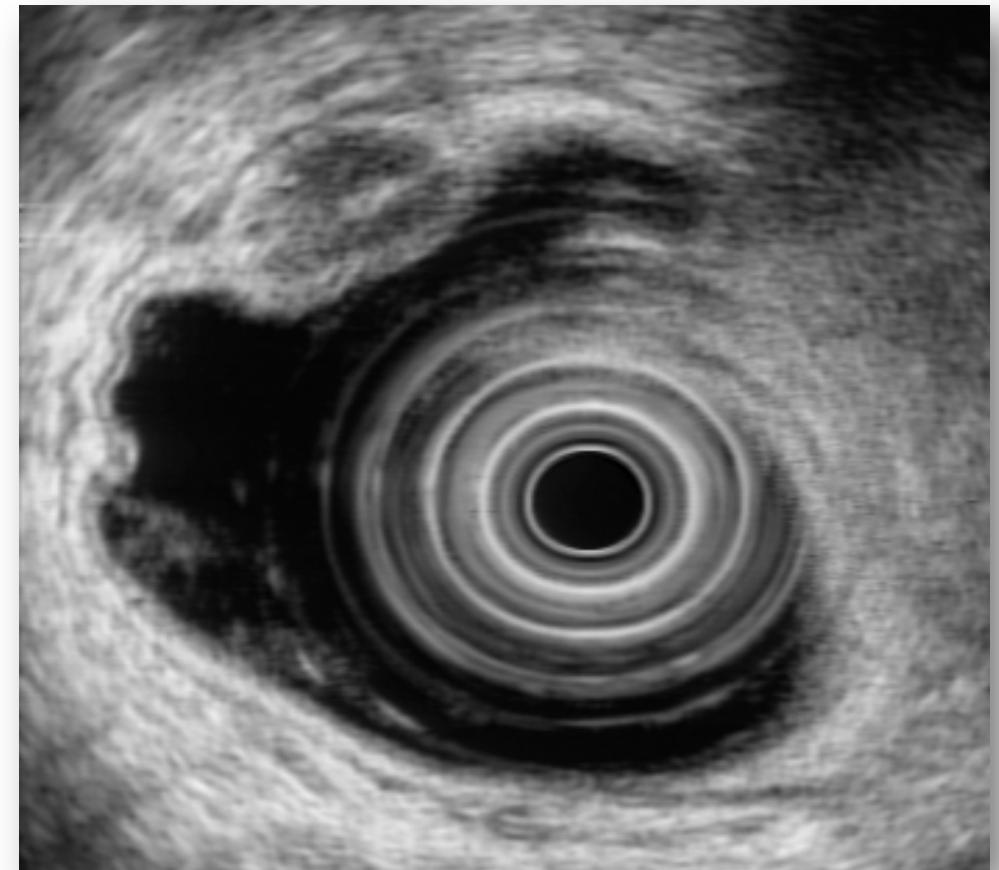
- We suggest EMR or ESD for the resection of type 1 gastric neuroendocrine tumors (gNETs). (Conditional recommendation; very low quality of evidence)

Gastric NET

- *Type 1*



❖ >1 cm: EMR or ESD



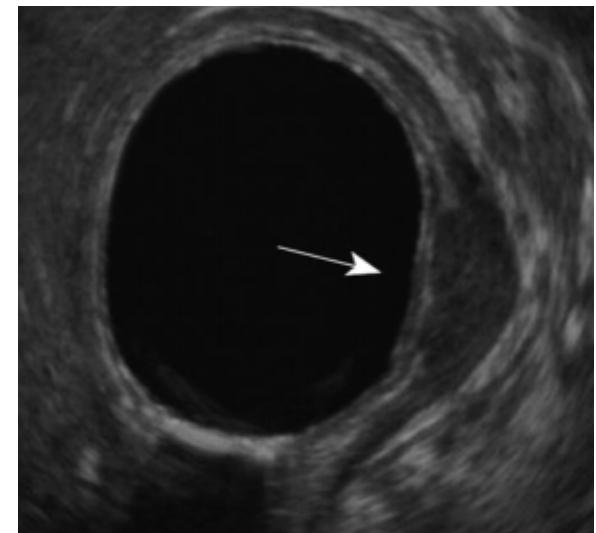
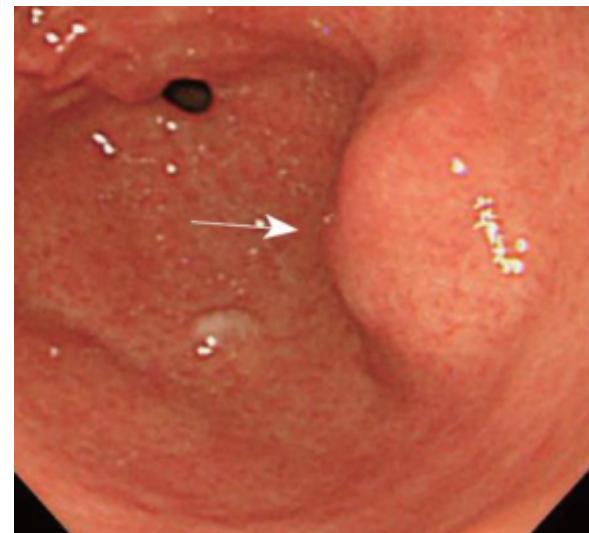
Canakis A and Lee LS. World J GIE 2022.

ACG Guideline: Treatment of Subepithelial Lesions

- We suggest ESD over EMR for the resection of low-grade, small type 3 gNETs without radiologist or EUS evidence of lymphadenopathy that do not undergo surgical resection (Conditional recommendation; very low quality of evidence)

Gastric NET

- *Type 3*
 - ❖ 30-80% metastasis
 - ❖ >1 cm associated with LN metastasis
 - ❖ Consider ESD in <1 cm, well differentiated, G1-2, negative DOTATATE

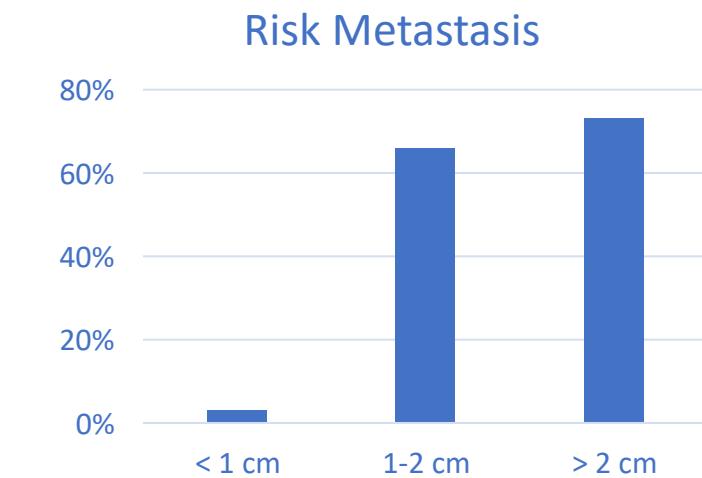


ACG Guideline: Treatment of Subepithelial Lesions

- We do not suggest one type of endoscopic therapy (EMR or ESD) for the resection of small (<1 cm), low grade rectal NETs. (Conditional recommendation; very low quality of evidence)

Rectal NET

- Size, depth of invasion, grade all affect prognosis
- 70-88% < 1 cm
- <1 cm rectal: band ligation or underwater EMR
- 1-2 cm rectal: ?ESD

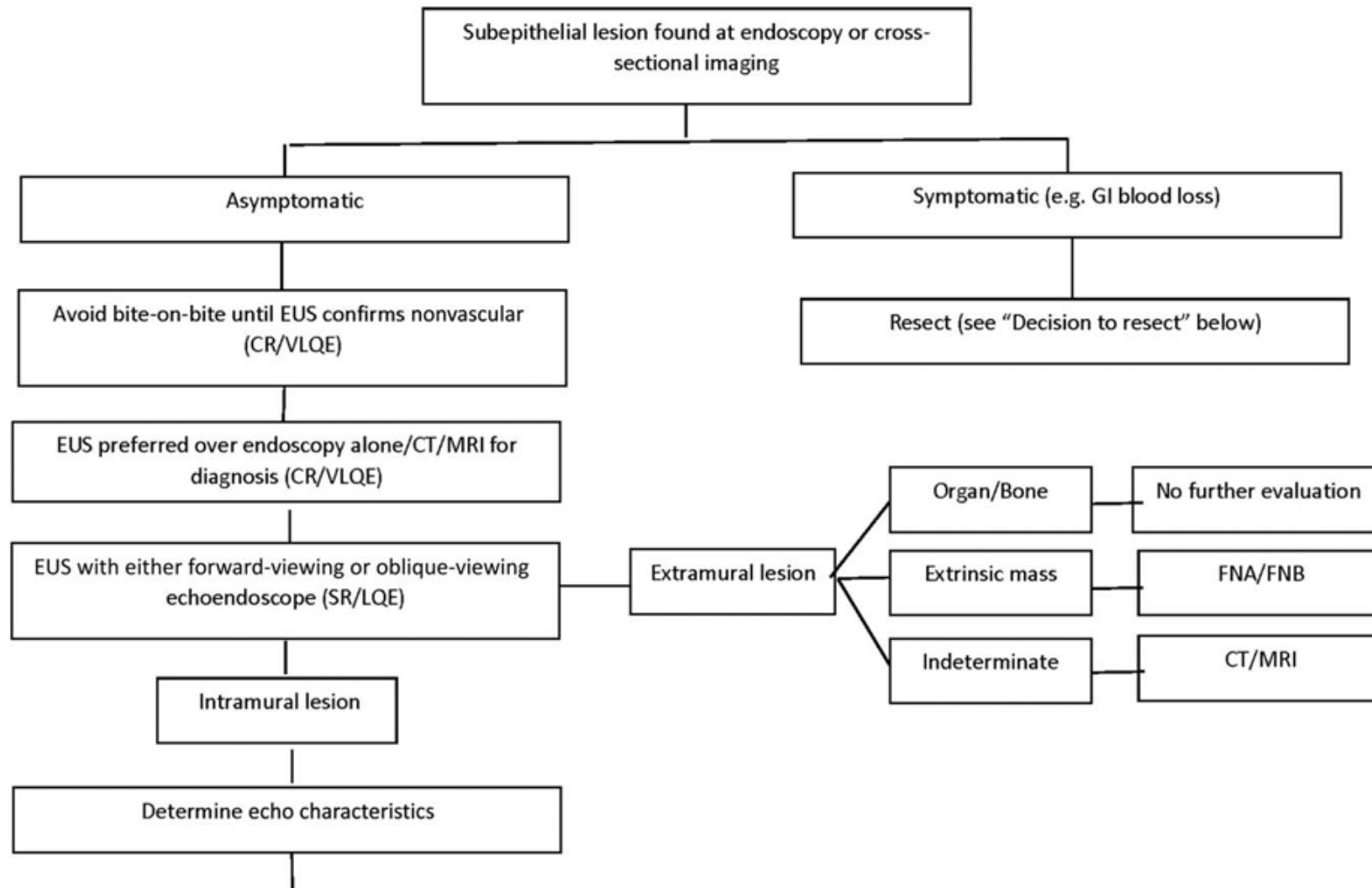


Canakis A and Lee LS. World J GIE 2022.

ACG Guideline: Diagnosis of Subepithelial Lesions

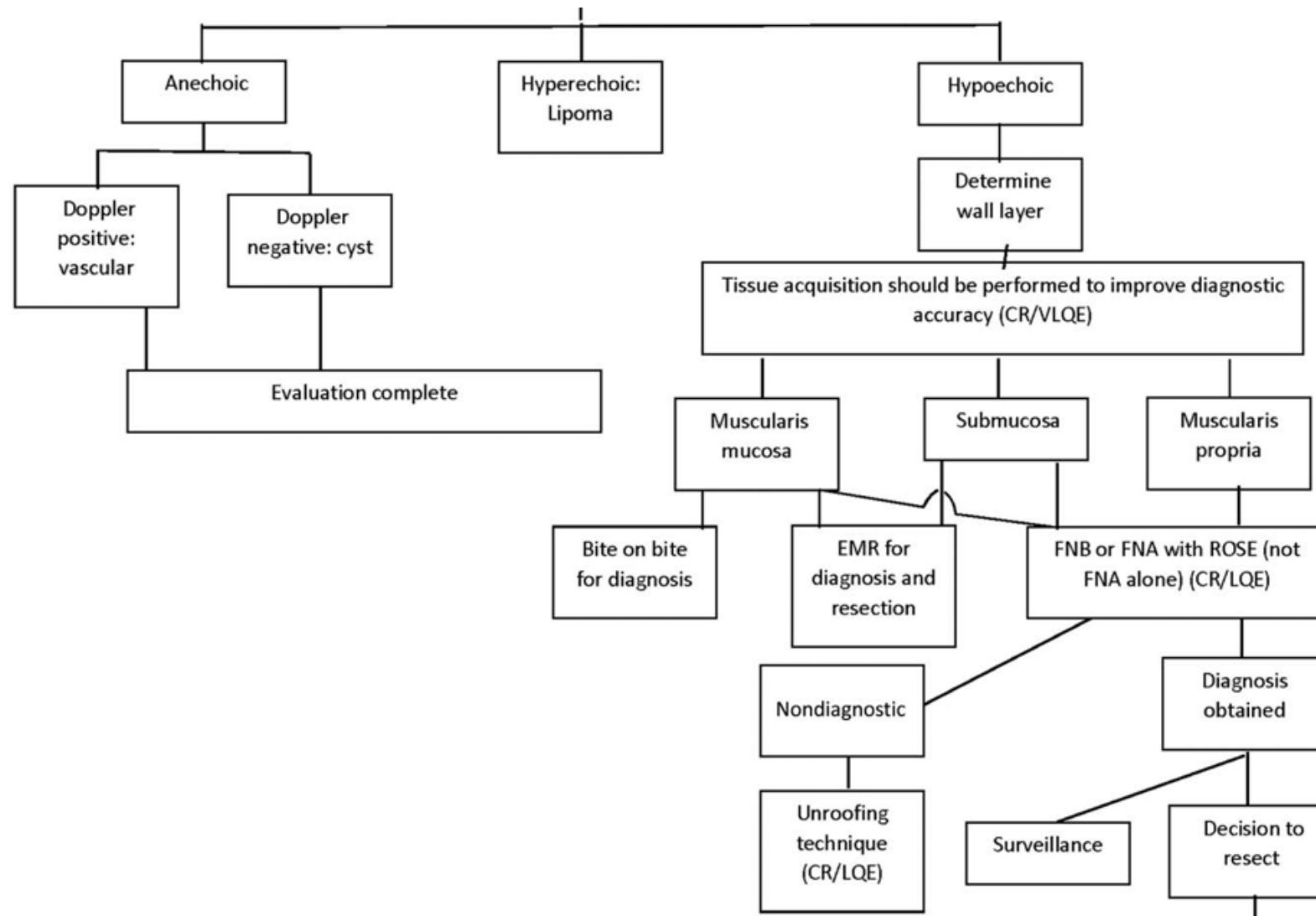
- Key concept: In the absence of a tissue diagnosis and/or resection of a SEL, the patient should be enrolled in some form of surveillance plan unless there is a high degree of confidence that the SEL has no malignant potential.

Algorithm



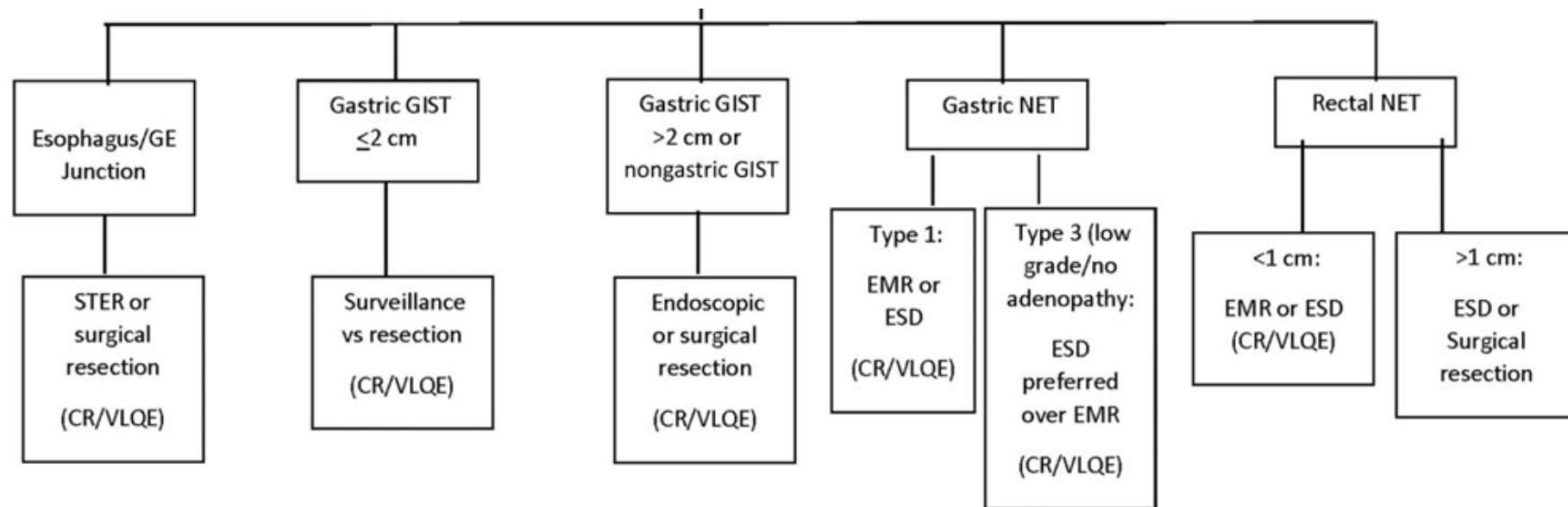
Jacobson BC et al. AJG 2023

Algorithm



Jacobson BC et al. AJG 2023

Algorithm



Jacobson BC et al. AJG 2023

Thank you from Boston!



Brigham and Women's Hospital
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