



# Beneath the Surface: Decoding (Submucosal) Subepithelial GI Lesions



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# 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

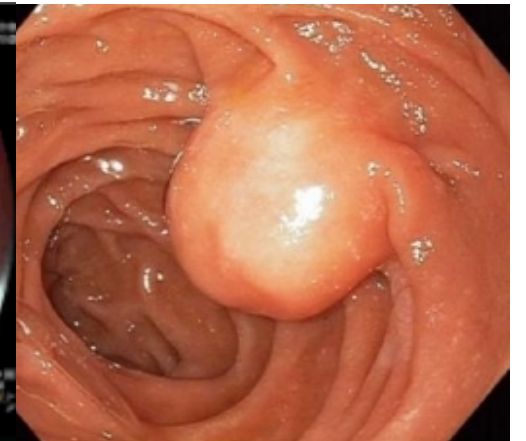
29%



59%



12%



# Subepithelial Lesions: Esophagus

## Esophagus

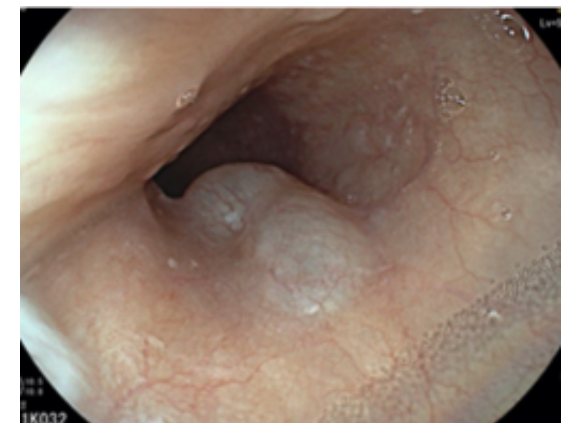
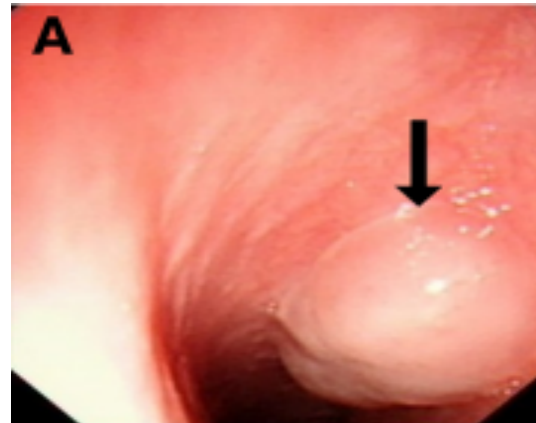
66-77% Leiomyoma

13% Granular cell tumor

5% Lymphangioma

1% Cyst

1% Lipoma





# 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

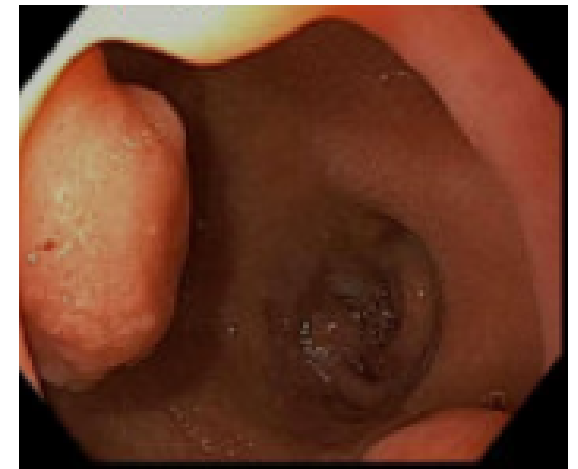
17% Neuroendocrine tumor

17% GIST

14% Lipoma

2% Pancreatic rest

2% Lymphangioma



# Subepithelial Lesions: Rectum

## Rectum

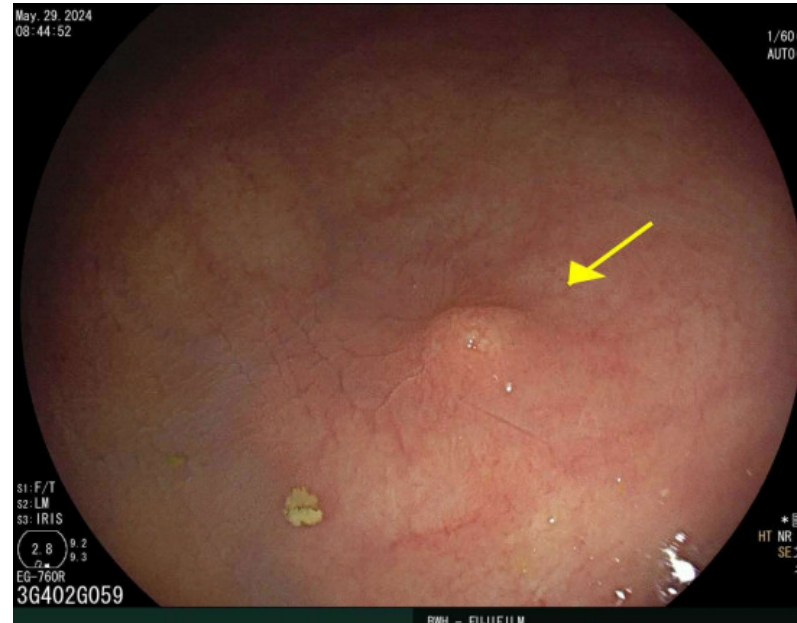
43% Neuroendocrine tumor

14% Lipoma

13% Lymphangioma

7% GIST

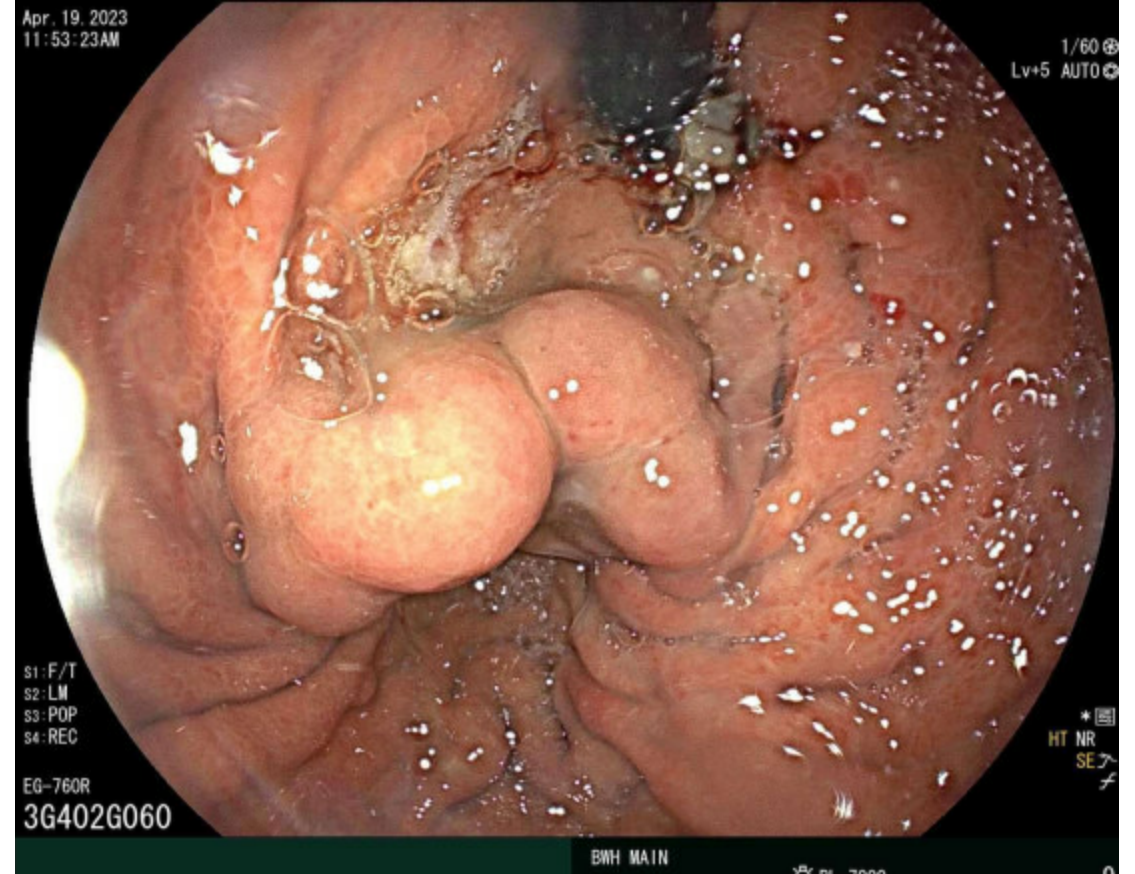
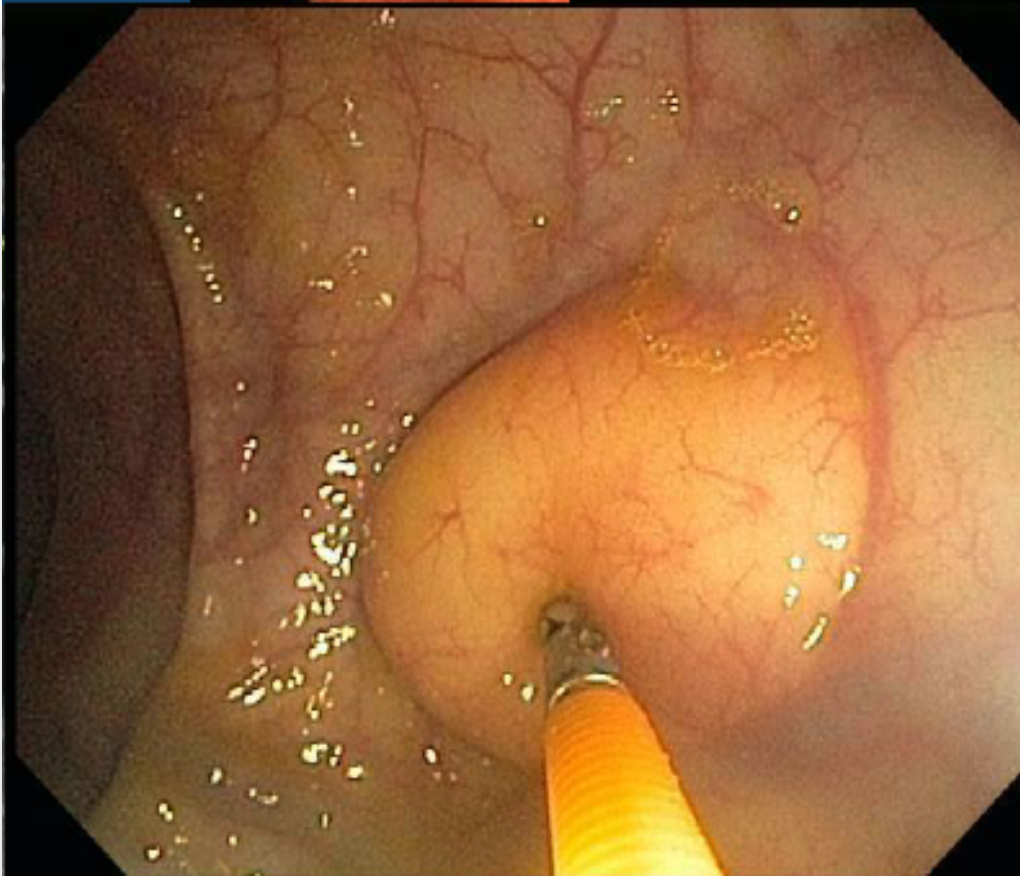
7% Leiomyoma



# 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

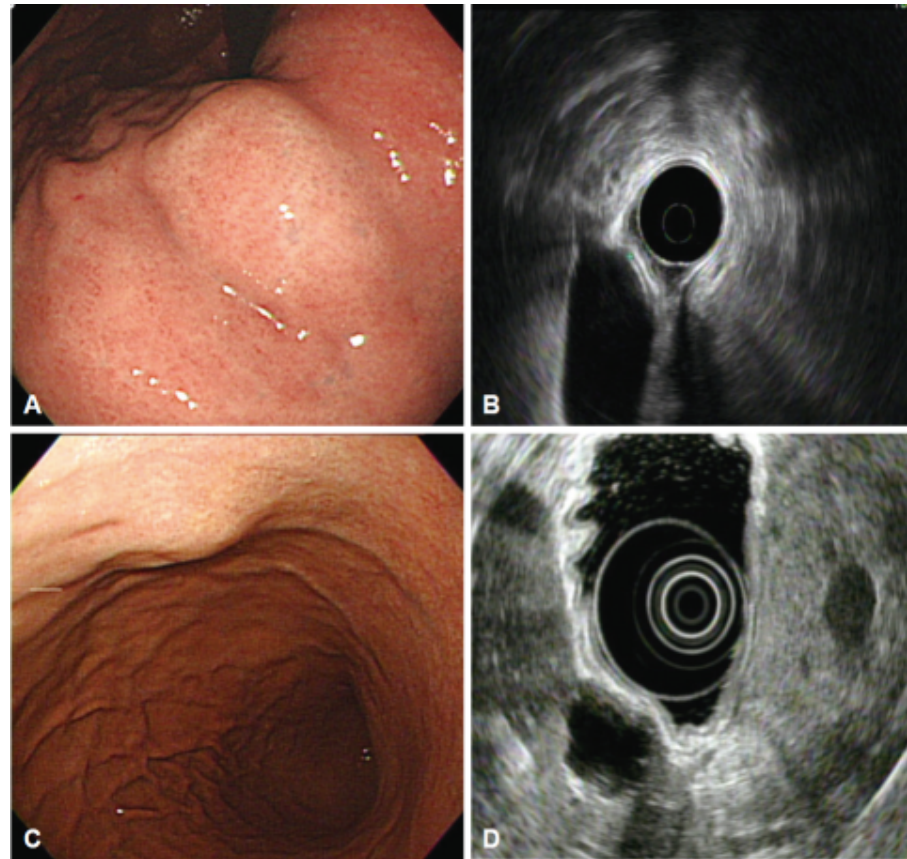
- We do not recommend one type of echoendoscope (forward viewing vs oblique viewing) when evaluating SEL (strong recommendation; low quality of evidence)



*Jacobson BC et al. AJG 2023*

# Extrinsic Compression

- Up to 1/3



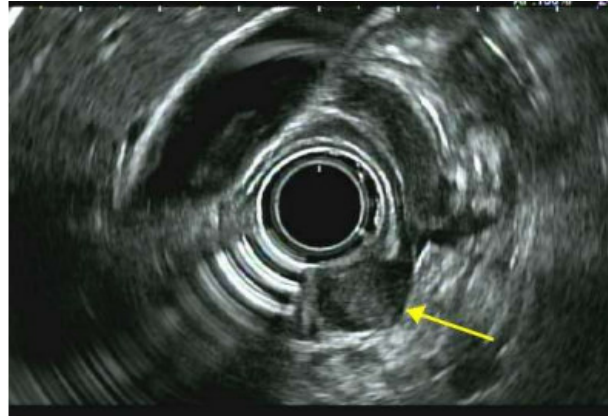
*Suzuki R and Bhutani M. GIE 2013  
Gong EJ, Kim DH. Clin Endosc 2016.*

# 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

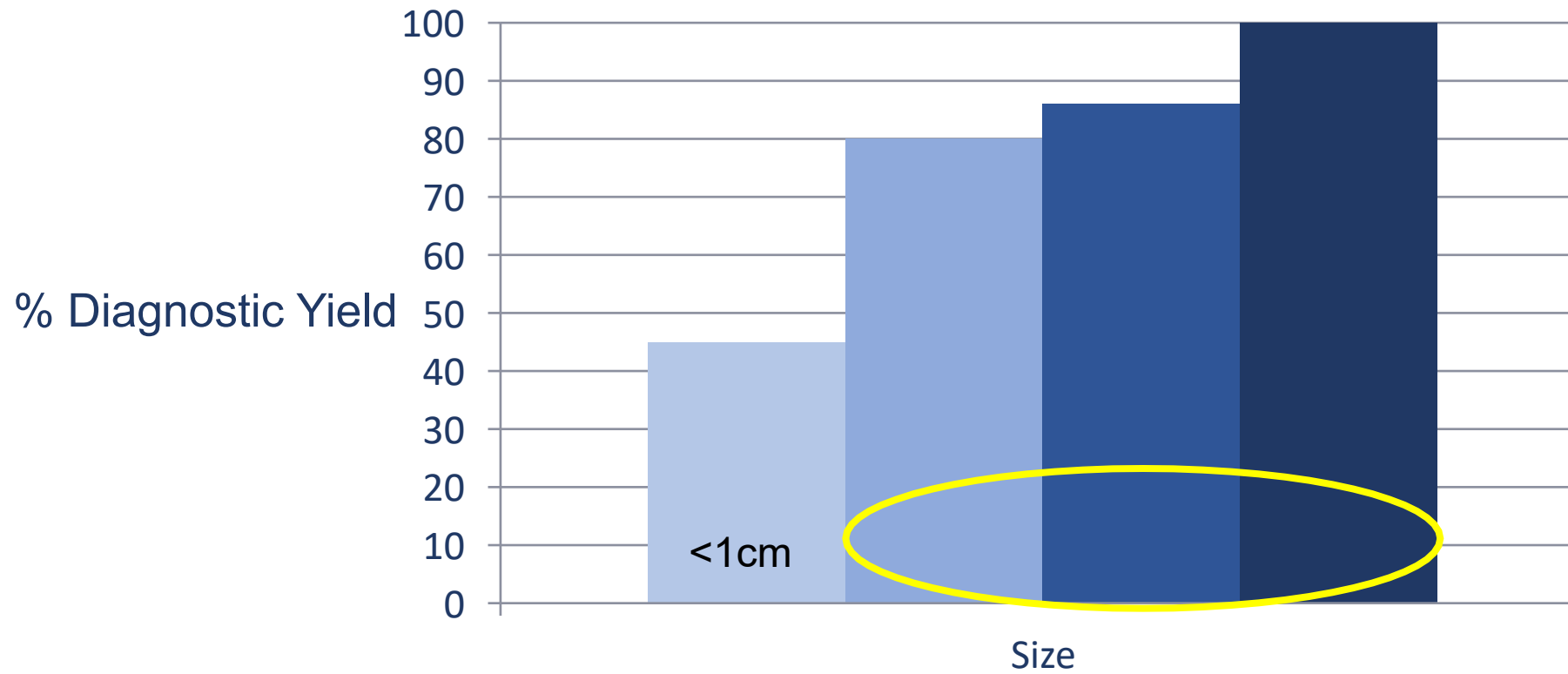
	Layer			Echotexture
	M. mucosa	Submucosa	M. propria	
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# ACG Guideline: Diagnosis of Subepithelial Lesions

- 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

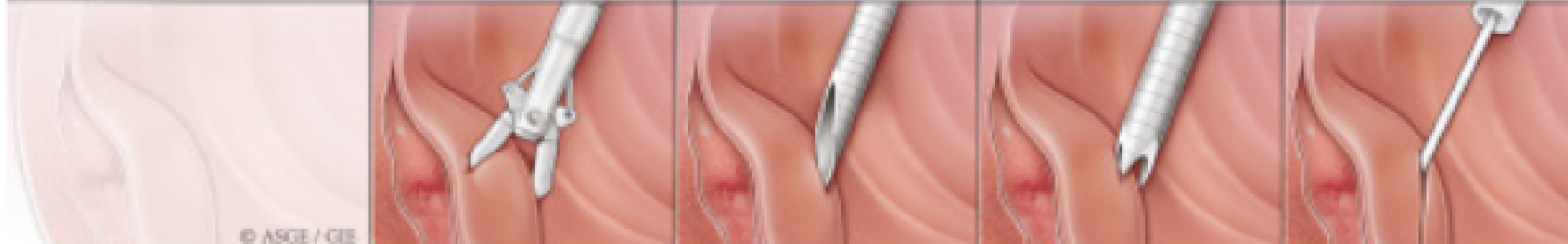


*Hoda KM et al. GIE 2009; Beshir A et al. GIE 2014; Rong L et al. Dig Endosc 2012; Akahoshi K et al. World J GI 2007; Joo DC et al. Surg Endo 2022; Nagai K et al. EUS 2021*

# ACG Guideline: Diagnosis of Subepithelial Lesions

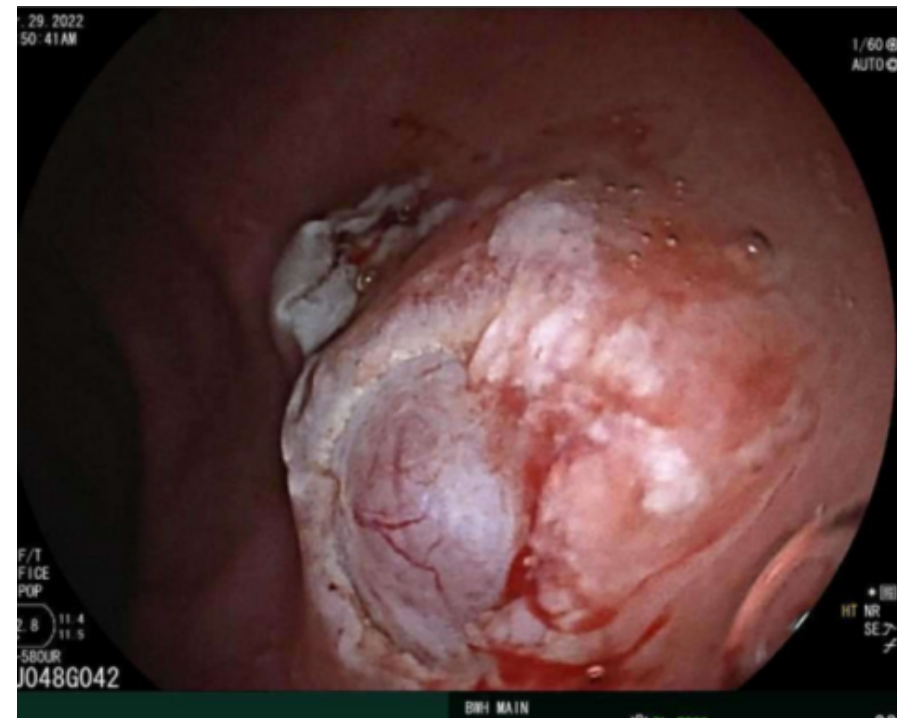
- We suggest using an unroofing technique when a preresection definitive diagnosis of a SEL is necessary and when EUS-FNA or FNB is nondiagnostic (Conditional recommendation; low quality of evidence)

	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)	2.8 - 3.9%	1.0 - 4.5%	0.9 - 7.7 %	1.9 - 7.9%

The table is followed by four vertical illustrations showing the different biopsy techniques. From left to right: 1. Endoscopic Biopsy: A standard biopsy forceps is shown taking a sample from the mucosal surface. 2. EUS-FNA: An endoscopic ultrasound probe is shown with a fine needle aspirating a subepithelial lesion. 3. EUS-FNB: An endoscopic ultrasound probe is shown with a larger needle core sampling a subepithelial lesion. 4. MIAB: An endoscopic ultrasound probe is shown with a mucosal incision being made to expose the subepithelial layer for biopsy. A small copyright notice '© ASGE / GIE' is visible at the bottom left of the illustrations.

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

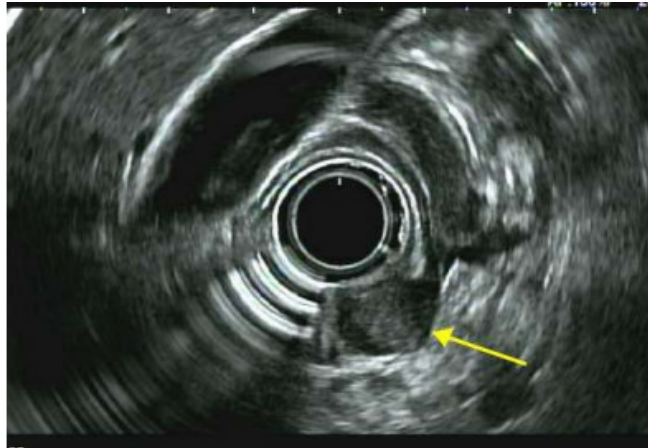
# Mucosal Incision-Assisted Biopsy/ Unroofing Techniques



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

# Case

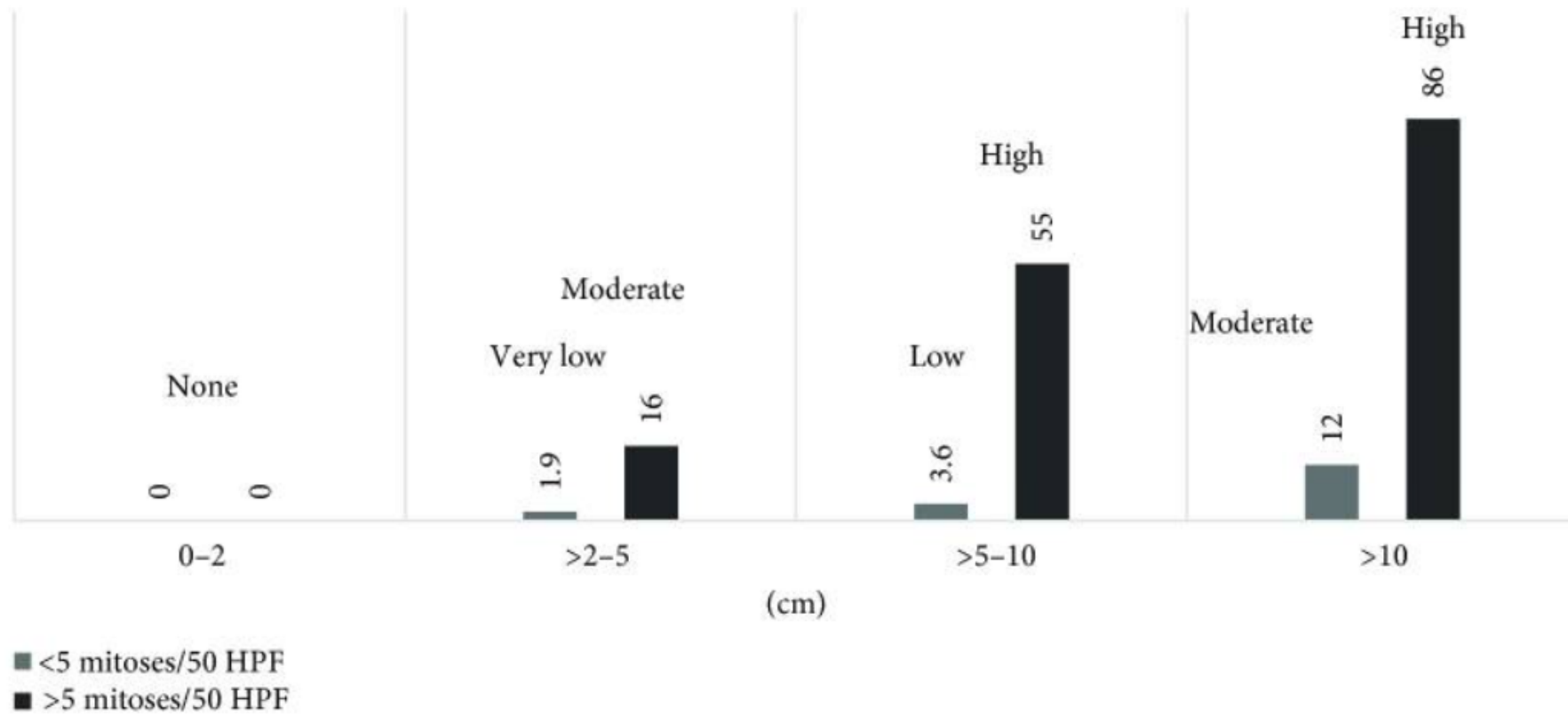
- 45yo male with dysphagia and no other significant past medical history undergoes EGD.
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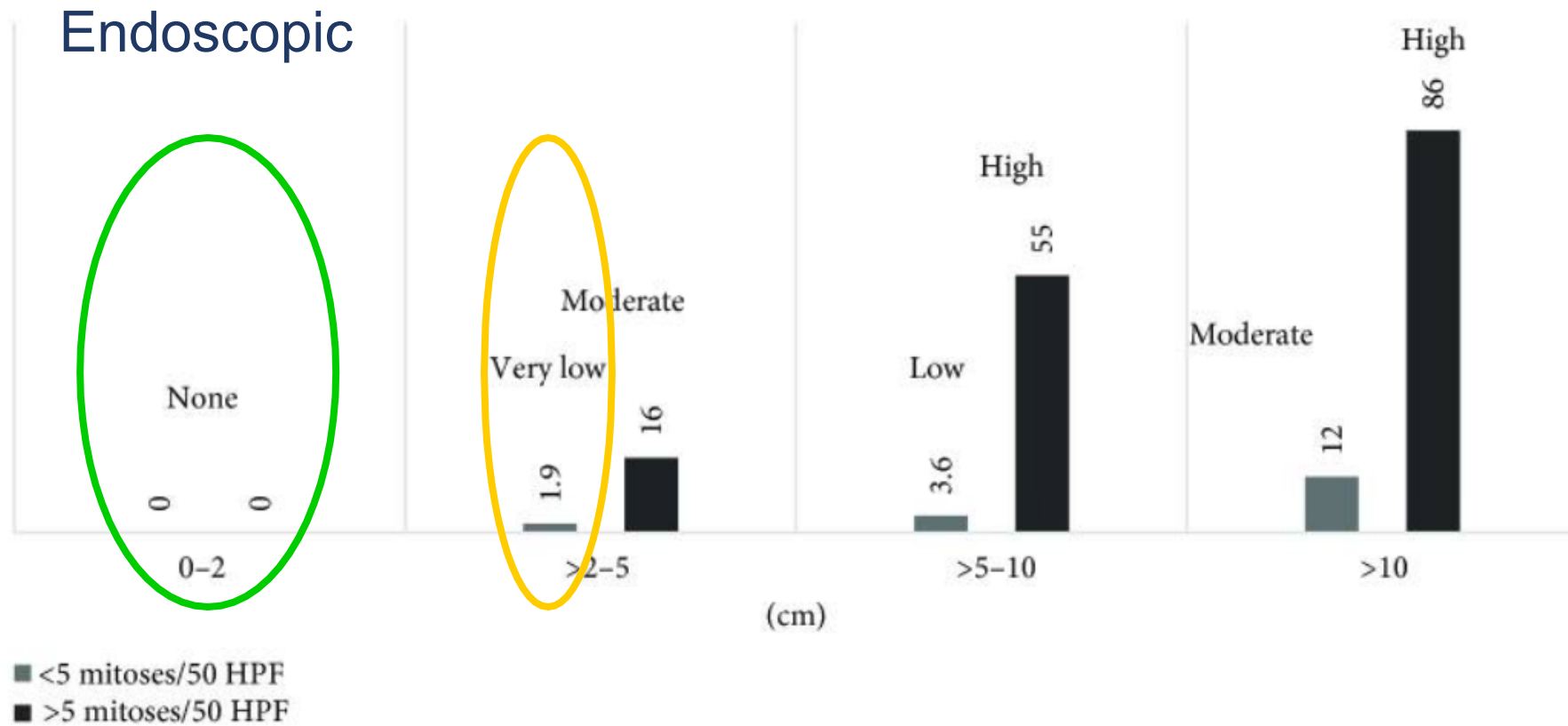


# GIST

# Risk of Malignancy in Gastric GISTs



# Risk of Malignancy in Gastric GISTs



# 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)

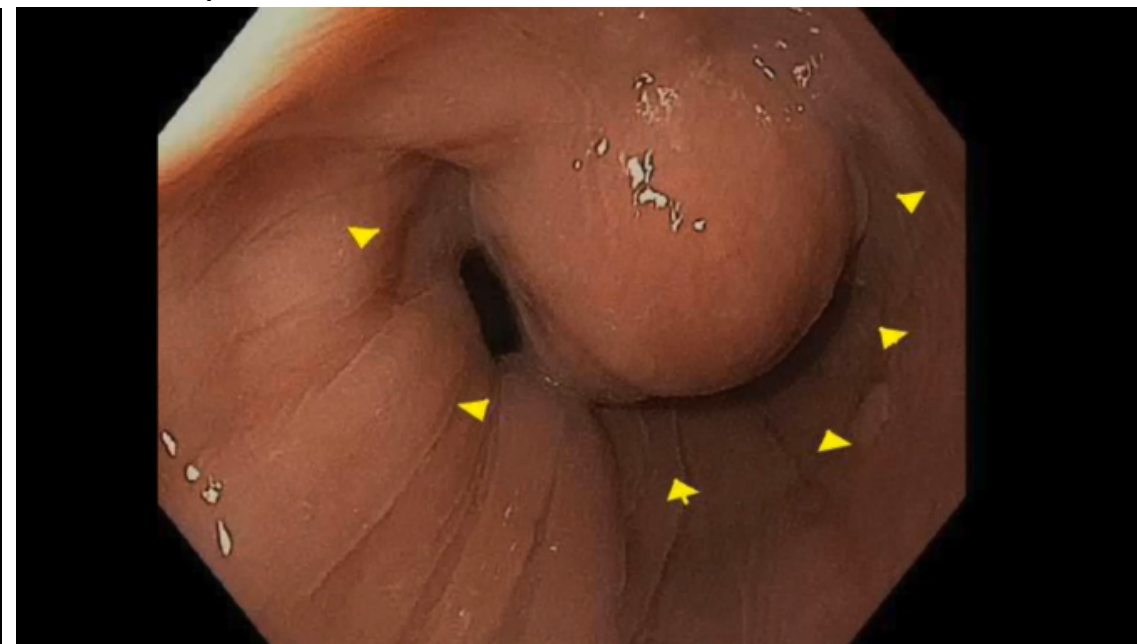
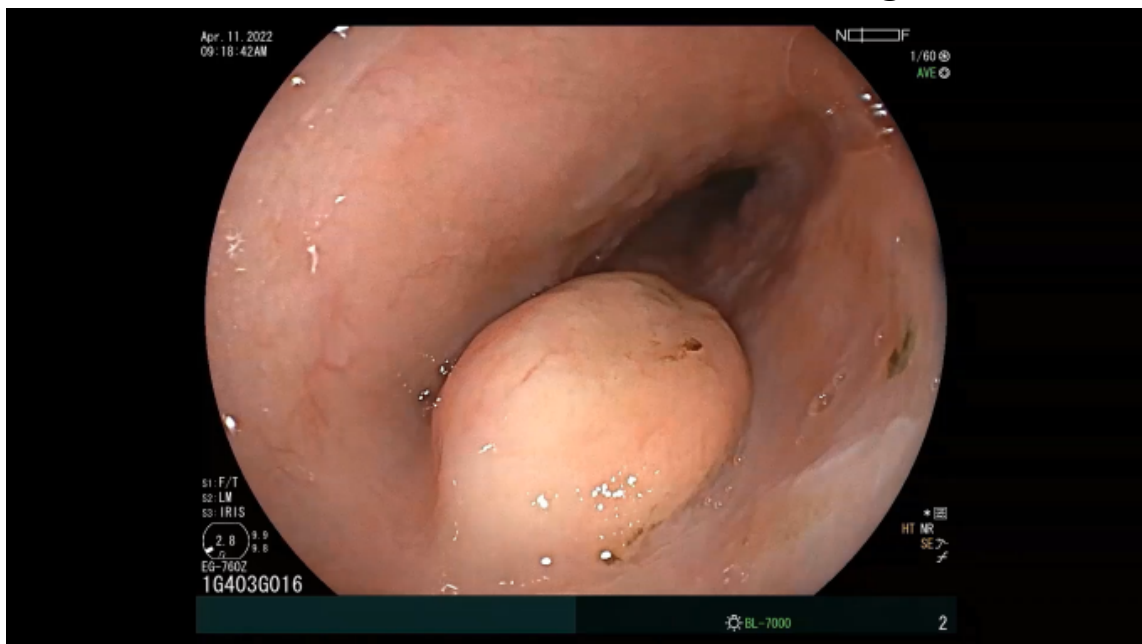


# Endoscopic Resection

## ESD/ ESE

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

## STER



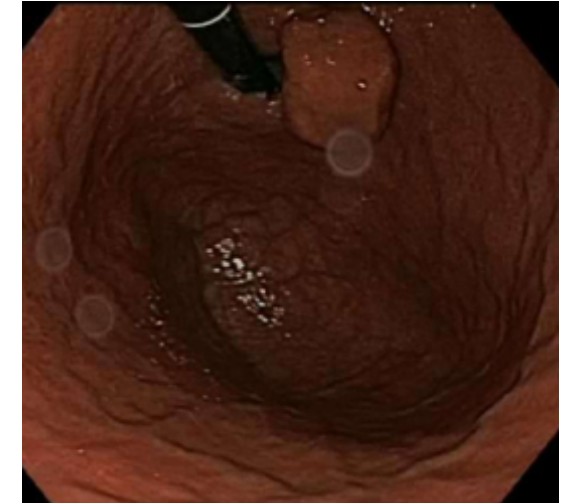
ESE ~ STER efficacy (~91-5%) and adverse events (~6% perforation)  
ESE faster  
STER for larger (1-4cm) lesions

# Leiomyoma

- Asymptomatic leiomyomas:

- ❖ Large: Resect

- ❖ Small: No surveillance or periodic surveillance



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

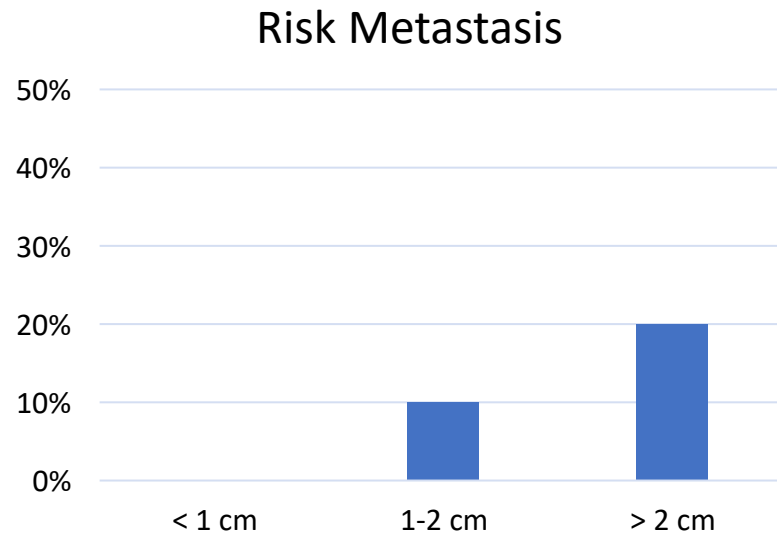
# Neuroendocrine Tumors

# ACG Guideline: Treatment of Subepithelial Lesions

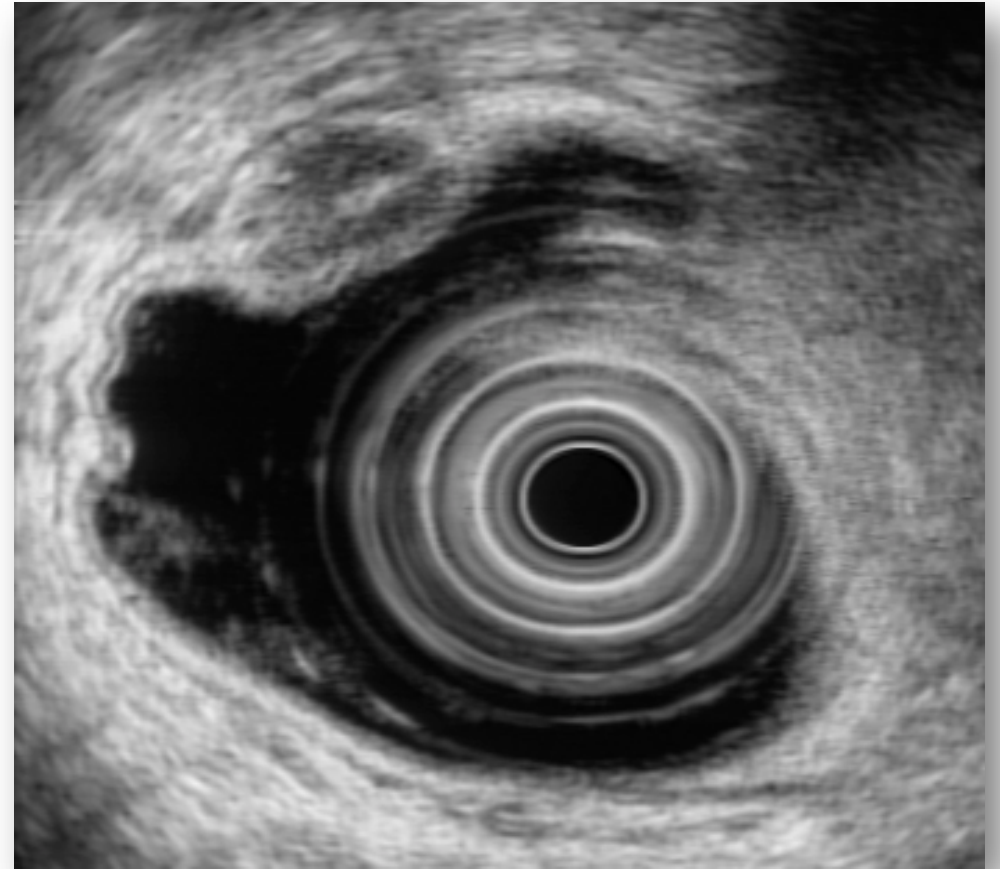
- We suggest EMR or ESD for the resection of type 1 gastric neuroendocrine tumors (gNETs). (Conditional recommendation; very low quality of evidence)

# Gastric NET

- *Type 1*



❖ >1 cm: EMR or ESD



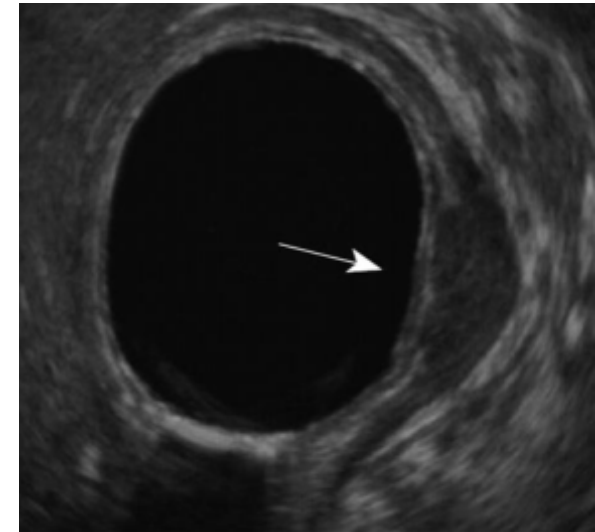
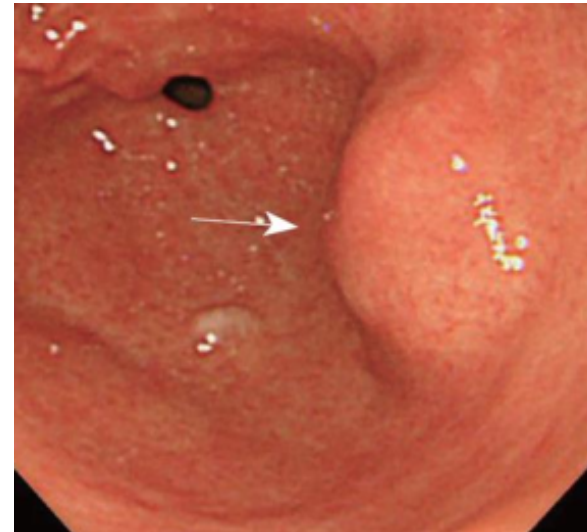
Canakis A and Lee LS. World J GIE 2022.

# 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



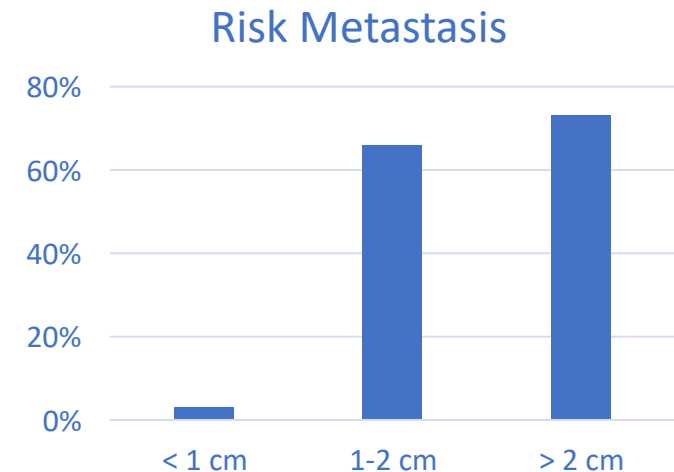


# ACG Guideline: Treatment of Subepithelial Lesions

- 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

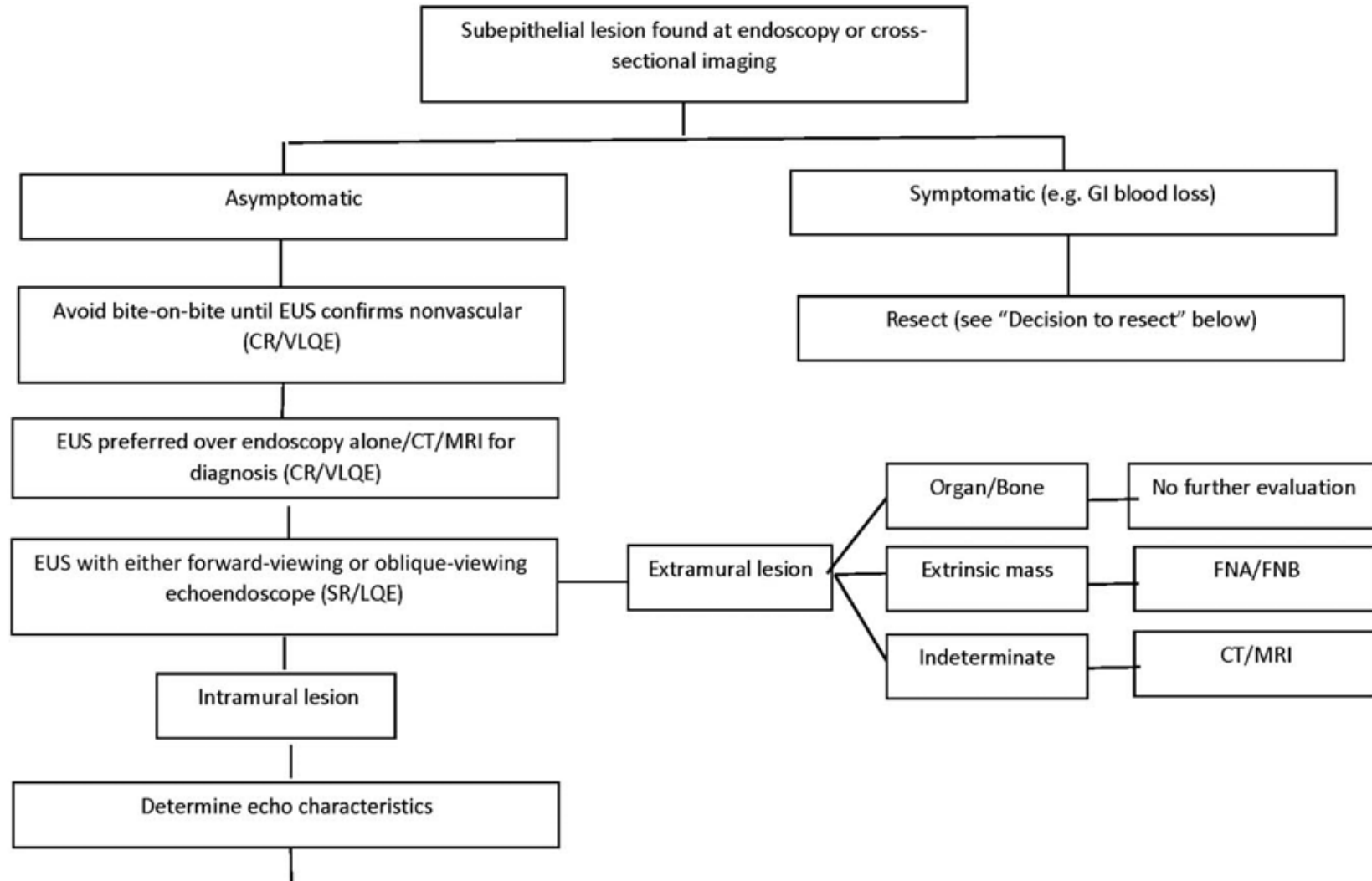
- Size, depth of invasion, grade all affect prognosis
- 70-88% < 1 cm
- <1 cm rectal: band ligation or underwater EMR
- 1-2 cm rectal: ?ESD



# ACG Guideline: Diagnosis of Subepithelial Lesions

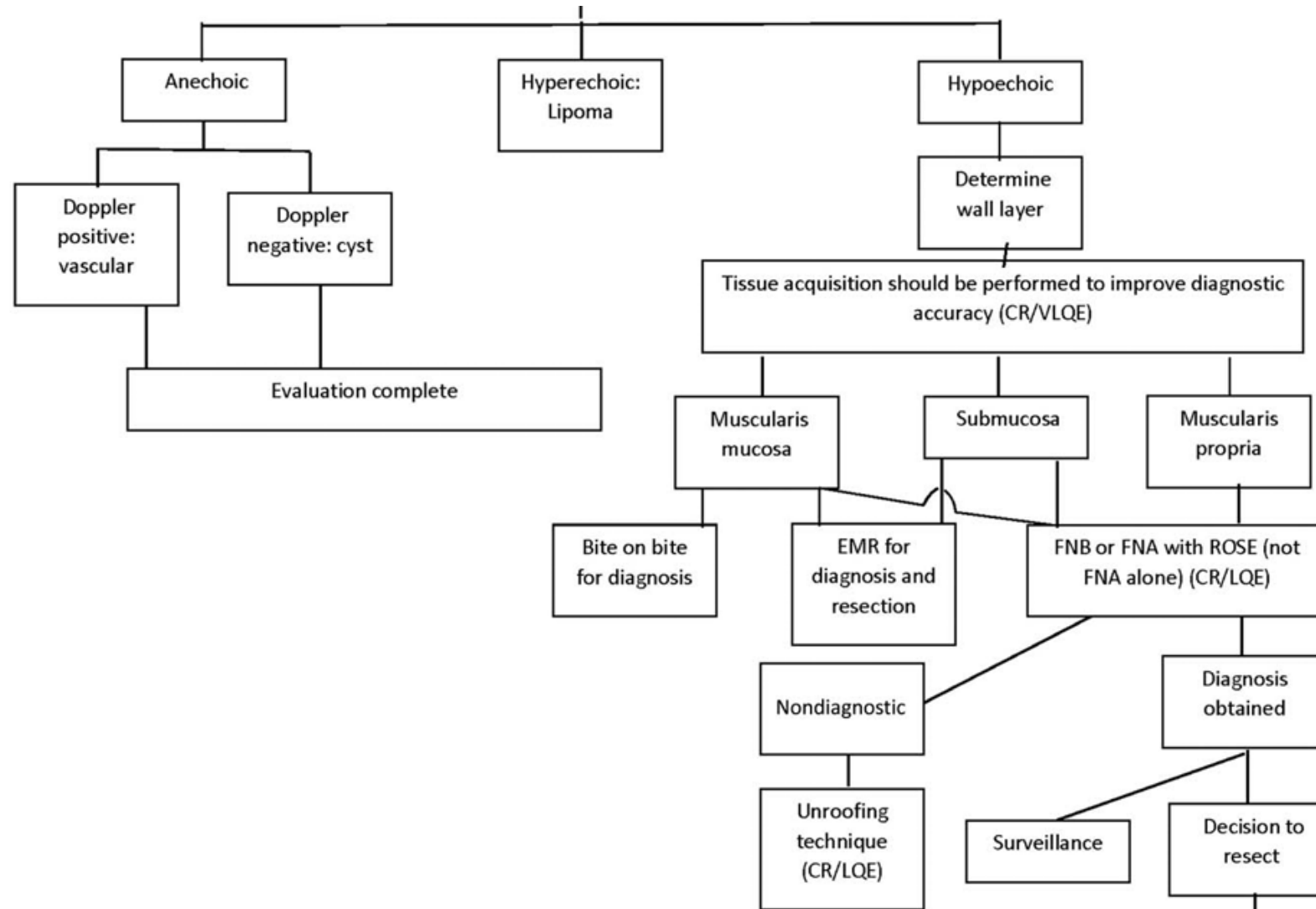
- Key concept: In the absence of a tissue diagnosis and/or resection of a SEL, the patient should be enrolled in some form of surveillance plan unless there is a high degree of confidence that the SEL has no malignant potential.

# Algorithm



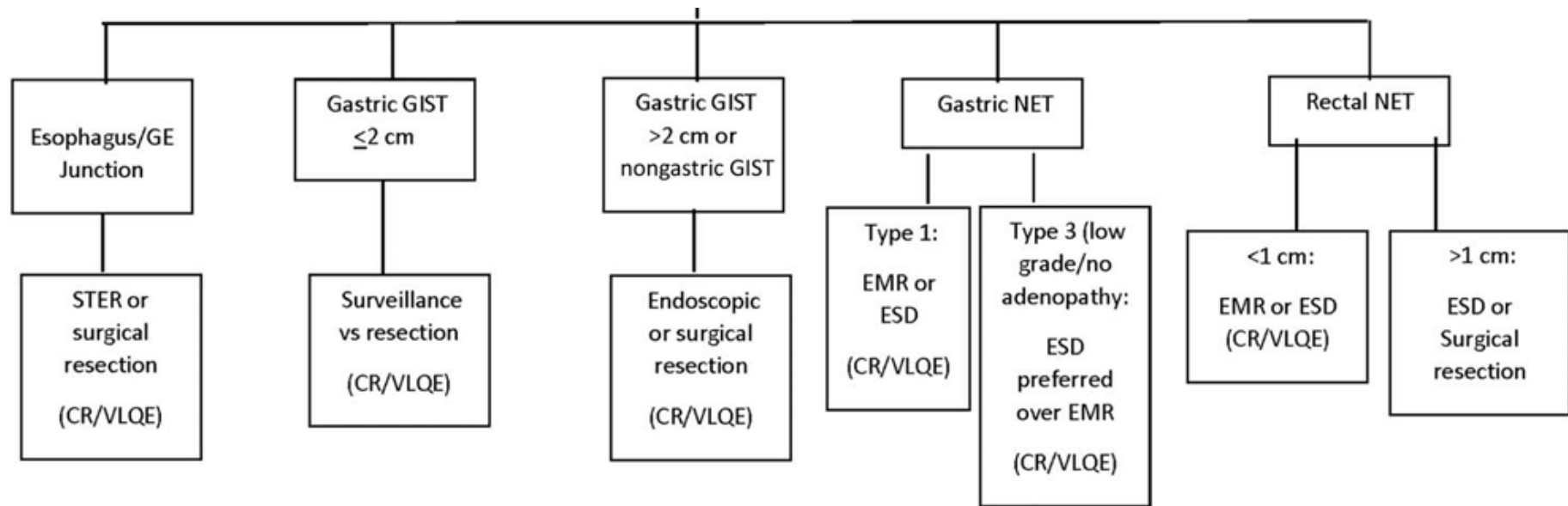
*Jacobson BC et al. AJG 2023*

# Algorithm



Jacobson BC et al. AJG 2023

# Algorithm





# *Thank you from Boston!*

