EUS Evaluation of GI Lumps and Bumps

The differential diagnosis of GI subepithelial lesions from the esophagus to rectum with the aid of EUS FNA

Ferga C. Gleeson, MD, FACG, FASGE

A subepithelial lesion can arise from:

Any layer within the gastrointestinal tract wall (intramural)
or
Outside the wall (extramural)
Extramural structures or lesions:
- Spleen
- Aorta
- Gallbladder
- Splenic artery aneurysm
- Cyst
- Tumor

Originating lesion layer

Echogenicity, vascularity, margins, size of the lesion ± lymph nodes

Sampling & immunostaining

Hyperechoic 3rd layer
Echogenicity

- Anechoic
  - cysts, vessels, and the gallbladder

- Hypoechoic
  - leiomyomas, GISTs

- Hyperechoic
  - lipoma

- Isoechoic
  - somewhere in between hyperechoic & hypoechoic

Common Lesions & Layer

- GISTs - muscularis propria
- Leiomyoma - muscularis propria
- Lipoma - Submucosa
- Carcinoid - Submucosa
- Granular Cell Tumor - Submucosa
- Duplication Cyst - Submucosa
- Pancreatic rest - Submucosa
- Varices – Lamina propria or submucosa

EUS, EUS FNA and Core Biopsy

- Cellular morphology alone is often insufficient to yield a definitive diagnosis
  - i.e. spindle cell morphology; GIST vs. leiomyoma

- Immunohistochemistry with cKIT, DOG-1, SMA, and $100

- FNA yield ~ 62% for a definitive tissue diagnosis

- A superior method for tissue acquisition to perform IHC
  1. Trucut needle (Quickcore)
  2. EchoTip® ProCore™
Concordance of EUS FNA Diagnosis with the Final Diagnosis in Subepithelial Lesions

- EUS FNA → surgical pathology of gastric subepithelial lesions → accuracy 20-84%

What do these images represent?
What do these images represent?

1. Lipoma
2. Carcinoid
3. Cystic Pancreas Neuroendocrine Tumor
4. Duplication cyst
5. GIST
What do these images represent?

GIST Factoids

- Most common mesenchymal neoplasm of the GI tract
- Stomach (60-70%), small intestine (20-25%), colon/rectum (5%) and esophagus (<5%)
- 85-95% have c-KIT mutation
- Additional markers: smooth muscle actin (20-30%), and s100 protein
- Main factors associated with malignant potential: tumor size, mitotic rate and primary location (small intestinal > stomach)
- EUS tumor size (>4 cm), irregular extraluminal border, heterogeneity, echogenic foci, cystic spaces greater than 4 mm and enlarged lymph nodes were associated with malignancy
- EUS-FNA: sensitivity and specificity: 82% & 100%, with an accuracy of 86%. Onsite presence of a cytopathologist to confirm the adequacy of tissue samples, gastric vs. duodenal lesion location and lesion size significantly influence diagnostic yield.

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1. Lipoma
2. Carcinoid
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Leiomyoma Factoids

- Immunohistochemical studies are positive for smooth muscle actin and desmin and negative for c-kit.


What do these images represent?
What do these images represent?

1. GIST
2. Carcinoid
3. Hemorrhoids
4. Endometriosis
5. Pelvic abscess
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Endometriosis Factoids

- The GI tract is the most common site for extra pelvic endometriosis infiltration.

- The endometriotic implants are hypoechoic or heterogeneous crescent shaped lesions, involving the serosa and the muscularis propria layers of the rectal wall, sparing the mucosal layers.

- The heterogeneous EUS appearance of the implants is caused by the presence of "chocolate cysts" that result from hemorrhage within the implant.
What do these images represent?

1. Rectal Carcinoid
2. Submucosal Esophageal Cancer
3. Gastric GIST
4. Rectal Melanoma
5. Gastric Polyp
What do these images represent?

1. Rectal Carcinoid
2. Submucosal Esophageal Cancer
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4. Rectal Melanoma
5. Gastric Polyp
Melanoma Factoids

- Extremely rare malignancy (0.05% malignant colorectal neoplasia)
- Distant primary cancers rarely metastasize to the GI wall
  - 1/3,847 upper GI
  - 1/1,871 colonoscopies
- Circumferential wall thickening affecting predominantly the submucosal and muscularis propria layer which is in contrast to rectal endometriotic implants that are described as either hypoechoic or heterogeneous deposits involving the 4th and 5th layers with intact mucosal layers
- EUS FNA ± Trucut biopsy: primary cancer origin: bladder, breast, stomach and cutaneous melanoma

What do these images represent?

Patient with neurofibromatosis type 1 and a 3rd duodenum or periduodenal lesion
What do these images represent?

1. Neurofibroma
2. GIST
3. Lymphoma
4. Phaeochromocytoma
5. Sarcoma
What do these images represent?

Patient with neurofibromatosis type 1 and a 3rd duodenum or periduodenal lesion

More GIST Factoids

- DOG1 & C-Kit positive
- NF1-associated GIST’s mainly small bowel
  Prevalence 4-25%
- Usually GI bleeding & obstruction
- National Comprehensive Cancer Network (NCCN) treatment guidelines recommend R0 resection with an intact pseudocapsule and negative microscopic margins for patients with tumors ≥ 2 cm
What do these images represent?

1. Rectal Carcinoid
2. Rectal GIST
3. Lymphoma
4. Carcinoma
5. Sarcoma
What do these images represent?

1. Rectal Carcinoid
2. Rectal GIST
3. **Lymphoma**
4. Carcinoma
5. Sarcoma
What do these images represent?

Rectal subepithelial lesion

What do these images represent?

1. Lipoma
2. Carcinoid
3. Hemorrhoids
4. Duplication cyst
5. Pelvic abscess
What do these images represent?

1. Lipoma
2. Carcinoid
3. Hemorrhoids
4. Duplication cyst
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Rectal subepithelial lesion
Rectal Carcinoid Factoids

- Carcinoids are rare intramucosal tumors of endocrine cell origin with malignant potential and are commonly asymptomatic.

- Gastric and ileal carcinoids are commonly multiple, while those arising elsewhere are typically solitary.

What do these images represent?

Gastric Wall
What do these images represent?

1. Lymphoma
2. Linitis Plastica
3. Ménétrier's Disease
4. T2 Gastric Cancer
5. GIST
What do these images represent?

Gastric Wall

Gastric Linitis Plastica Factoids

- The routine use of staging EUS can sometimes alter the therapeutic plan because of the finding of otherwise occult distant metastases
  - left lobe liver lesions
  - peritoneal deposits
  - ascites

- 5 sonographic layers disappear and replaced by a hypoechogenic thickening of the wall with the 4th layer significantly thickened

- Max full thickness of the wall 8-27mm
- Perigastric ascites - 25%
- Perigastric lymph nodes - 41%
What do these images represent?

1. Rectal GIST
2. Rectal Lipoma
3. Rectal Adenoma
4. Rectal Carcinoid
5. Rectal endometriosis deposit
What do these images represent?

1. Rectal GIST
2. Rectal Lipoma
3. Rectal Adenoma
4. Rectal Carcinoid
5. Rectal endometriosis deposit
Lipoma Factoids

- Have no malignant potential
  - Typically present as solitary lesions
  - Yellow hue, often exhibit a “pillow sign” and some mobility
  - “Pillow sign”: 98% specificity and 40% sensitivity

- Homogeneous, hyperechoic, well-defined lesion, originating from the 3rd layer of the GI tract (submucosa) at EUS suggests a benign tumor, generally a lipoma.

- However, the following, although rare are in the differential for the upper GI tract:
  1. Brunner’s gland hamartoma
  2. Hamartomatous polyp
  3. Gangliocytic paraganglioma
  4. Renal cell carcinoma metastasis

What do these images represent?
What do these images represent?

1. Teratoma
2. Tailgut Cyst
3. Dermoid Cyst
4. Duplication cyst
5. Pelvic abscess
What do these images represent?

3.4 x 3.3cm multi-loculated cystic extrinsic rectal wall mass*
Tailgut Cyst Factoids

- Cystic hamartoma
- Cystic loculi are lined by squamous epithelium, transitional type epithelium, and columnar epithelium with focal goblet cells
- Malignant potential
- Current recommendation is to avoid FNA of perirectal cysts due to concerns regarding abscess formation even with prophylactic antibiotic use, as highlighted in one patient who subsequently required percutaneous drainage [1].
- Complete intact surgical excision is advised to avoid the potential risk of needle-tract seeding, infection, and fistula formation [2].


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