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CASE REVIEW
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Clinical Case: Evaluation of a Gastric Subepithelial Mass

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Introduction

Subepithelial masses are lesions that appear as a mass or bulge on endoscopy with normal appearing overlying mucosa. These masses are often referred to as 'submucosal' lesions; however, the more accurate descriptor for these lesions is 'subepithelial' since the submucosa is a distinct histologic layer of the gastrointestinal (GI) tract wall and subepithelial lesions can be continuous with any layer of the GI tract wall or result from extrinsic compression.[1] Appropriate evaluation and management of subepithelial masses is essential since these lesions can potentially be malignant. A case will be presented to discuss the challenges that can be encountered in the evaluation of these lesions and how the role of endoscopy and EUS can impact management.

Case presentation

A 57-year-old gentleman presents for an endoscopy for evaluation of chronic reflux symptoms. He denied abdominal pain or weight loss. Endoscopic examination reveals an incidental finding of a subepithelial mass in the antrum of the stomach (Figure 1). The overlying mucosa is normal in appearance. Mucosal biopsies are performed to obtain tissue for a diagnosis.

Breaking point

Although rarely diagnostic, it is reasonable to perform biopsies of the mucosa overlying subepithelial lesions.[2] Stacked (bite-on-bite) biopsies can be attempted but the yield remains low. In addition to performing biopsies, the lesion should be probed with closed biopsy forceps to evaluate the consistency and mobility of the lesion which may provide additional clues about the etiology of the lesion. In this case, though, the mass is semi-pedunculated and is clearly not a cystic or vascular lesion or due to extrinsic compression from an extramural mass. Based on the endoscopic appearance and location of this lesion, the most likely diagnosis is a gastrointestinal stromal tumor (GIST), which is a neoplastic lesion with malignant potential. However, also in the differential includes benign lesions such as a lipoma, leiomyoma, or schwannoma. A more comprehensive list of the differential diagnosis is provided in Table 1. Endoscopic evaluation alone is insufficient for diagnosing the etiology of a subepithelial

lesion.[3] Therefore, EUS imaging of this lesion with fine needle aspiration (FNA) or core needle biopsy should be performed. EUS imaging can usually identify the layer of the wall that the lesion is in continuity with, which helps narrow the differential diagnosis. Furthermore, EUS can be used to accurately diagnose lipomas (intensely hyperechoic lesions continuous with the submucosal layer of the GI tract wall) without the need to obtain tissue for histologic diagnosis. In the case of potentially neoplastic lesions, EUS can be used to obtain an accurate measurement of the size of the lesions, cystic components and irregular margins, which are important criteria in assessing the malignant potential of GISTs.[4-6]

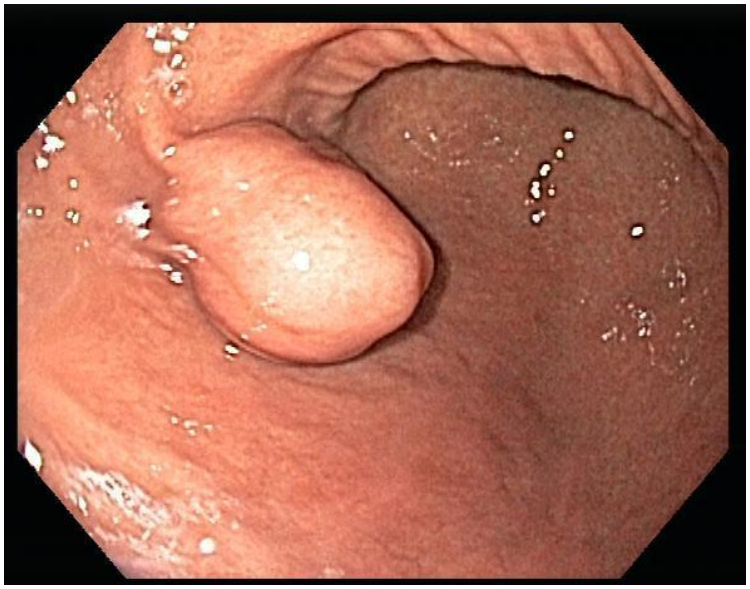

Figure 1. Endoscopic image of a subepithelial mass in the gastric antrum.

Subepithelial lesion
Malignant or potentially malignant lesions
GIST
Lymphoma
Carcinoid
Glomus tumor
Metastatic carcinoma
Benign lesions or those with very low malignant potential
Leiomyoma*
Schwannoma
Fibroma
Neurofibroma
Osteochondroma
Lipoma
Lymphangioma
Fibrovascular polyp
Duplication cyst
Varices
Pancreatic rest

Table 1: Differential diagnosis of gastric subepithelial masses**.**

*Very low malignant potential

Case presentation

EUS imaging demonstrated the lesion to be hypoechoic, continuous with the muscularis propria (4th EUS layer) and measured to be 2.2 x 1.8 cm (Figure 2).

Breaking point

At this point, the endoscopist needs to decide whether or not to attempt tissue acquisition and if so, what method should be used. Since this lesion has been localized to the muscularis propria layer and is hypoechoic, the differential diagnosis can be narrowed. Again, the two most likely diagnoses included GIST, which has malignant potential, and a leiomyoma, which has very low malignant potential. Therefore, a tissue diagnosis will impact management since this patient is asymptomatic. If this patient were symptomatic from this lesion, then sampling the mass may not be necessary since it will require surgical resection. However, preoperative sampling may be considered since surgical management may differ based on the diagnosis. For example, if the lesion were diagnosed to be a leiomyoma, no preoperative CT scan would be necessary to evaluate for metastatic disease since it does not have any appreciable metastatic potential.

Either EUS-FNA or core biopsy can be used to obtain tissue. Pathologists prefer as much tissue as possible since the diagnosis of these lesions typically requires immunohistochemical (IHC) staining. Currently, needles available for tissue sampling include the full array of standard FNA needles as well as the ProCore® needles (Cook Medical, Winston-Salem, NC), which can provide core tissue samples for histologic evaluation. When performing needle biopsy of these lesions, it is important not to penetrate beyond the serosal capsule of the tumor since capsule ruptures are associated with a higher risk of recurrence after resection. Other sampling techniques include single incision needle knife (SINK)[7] or endoscopic mucosal resection (EMR) to expose the tumor followed by multiple stacked forceps biopsies to obtain tissue from the tumor. These methods may be preferred in cases where FNA or core biopsy of the tumor is difficult to perform (tumor size <2 cm or tumor location in the fundus). However, EUS should be performed prior to attempting these tissue acquisition techniques to confirm that the lesion is in the wall of the stomach and not due to extrinsic compression.

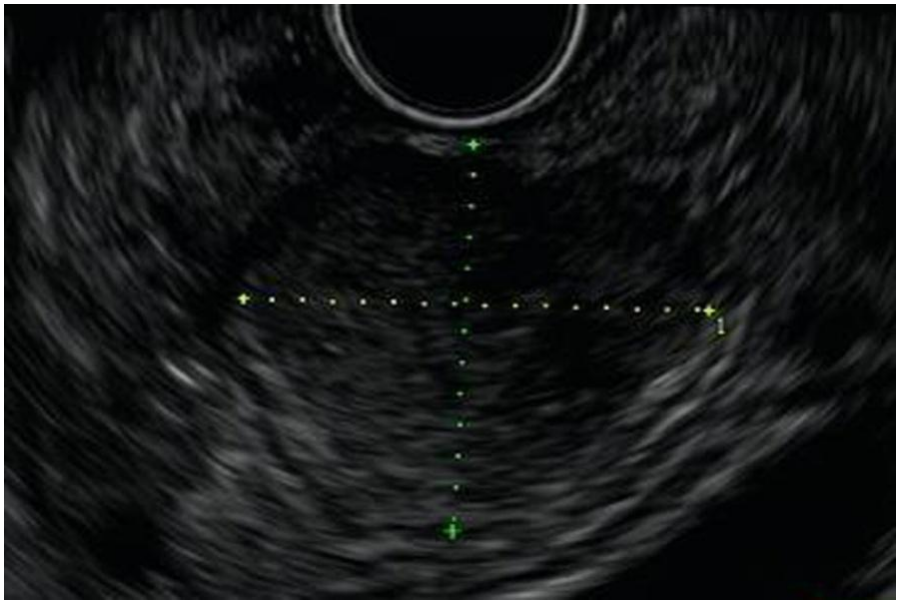

Figure 2 – EUS image using a linear array echoendoscope.

Case presentation

EUS-guided core biopsy was then performed using a 19-gauge ProCore® needle. Pathology demonstrated relatively bland round to vacuolated cells on H&E stains. IHC staining demonstrated positive staining for both DOG-1 and C-KIT. The histologic diagnosis was GIST with epithelioid morphology.

Breaking point

At this point, the diagnosis has been established as 2.2 cm epithelioid GIST. Demonstration of the epithelioid-type GIST as opposed to the more commonly seen spindle cell morphology GIST does not have any significant clinical implication. However, the epithelioid-type GIST can be a challenge for pathologists to diagnose and the use of IHC stains (C-KIT and DOG-1) can be very helpful in establishing the diagnosis.[8] If histology were to have demonstrated that this lesion were a leiomyoma or a schwannoma, then no further endoscopic evaluation would be necessary nor would surgical consultation be necessary in this asymptomatic patient. This further illustrates the importance of tissue acquisition as part of the endoscopic evaluation of these lesions. Benign lesions such as leiomyomas and schwannomas managed nonoperatively can still grow to ulcerate, bleed, or cause gastric outlet obstruction, all of which are situations which would require surgical resection for symptomatic management.

In our case, we have a neoplastic lesion with malignant potential. The two criteria used to assess the risk of malignancy in GISTs are lesion size and number of mitoses per 50 high-powered fields (HPFs)[9] and surgical resection is required to determine these variables. The mitosis rate cannot be accurately determined based on a core biopsy specimen due to the small size of the tissue sample and the need to assess 50 HPFs. Lesions that are less than 2 cm in diameter are thought to have a very low risk of malignancy and potentially could be monitored with frequent endoscopic surveillance. Lesions that are greater than 2 cm require pathologic evaluation to determine the risk of malignancy.[9] Given the size of this tumor, it likely has a low risk of metastasis; however, surgery is recommended. Once the diagnosis of a GIST greater than 2 cm in diameter is made, a preoperative CT should be performed to evaluate for possible metastasis. Typical sites for metastasis include liver, lung, and bone with metastasis to lymph nodes being rare.[10] If metastatic disease is identified, the patient should be referred to an oncologist for consideration of therapy with imatinib.

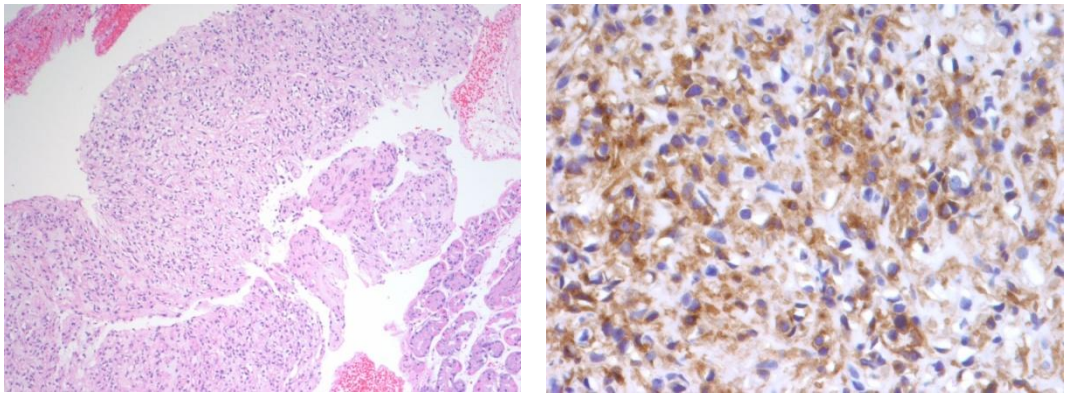

Figure 3 – Histology from core needle biopsy samples demonstrating an epithelioid-type GIST. The image on the left is a low power (H&E, 40X) image demonstrating round to vacuolated cells within a background of hyalinized stroma. The image to the right is a medium power (200 X) image demonstrating positive C-KIT staining.

Case resolution

A CT scan was performed that confirmed the presence of a mass in the gastric wall without any evidence of metastasis. The patient was then referred for surgical consultation. Based on the size of the lesion and the favorable location allowing for laparoscopic resection, the patient underwent resection of the lesion. The final pathology from the resected specimen confirmed the diagnosis of an epitheloid-type GIST with a mitosis rate of <5 per 50 HPF. This particular GIST is considered to be a low-risk GIST based on the size (2-5 cm) and low mitosis rate.[9]

Conclusion

Finding a subepithelial mass while performing endoscopy is not uncommon. An initial evaluation should be performed at the time the lesion is initially identified including probing with closed biopsy forceps, obtaining mucosal biopsies, and good photodocumentation. Assuming that the mucosal biopsies are non-diagnostic, EUS with FNA or core biopsy should be performed to further characterize the lesion and to obtain tissue for definitive diagnosis. Characterization of the lesion with EUS and tissue diagnosis will help to direct further management of the patient. In cases, where the lesion is small (<1 cm) tissue acquisition may be challenging. For these patients, an initial evaluation with EUS should be performed to identify the location of the lesion within the GI tract wall. The need for further endoscopic surveillance will depend on the findings from the EUS examination.

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