# Compliance with surveillance recommendations for foregut subepithelial tumors is poor: results of a prospective multicenter study CME

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**Background:** American Gastroenterological Association guidelines recommend performing EUS to characterize subepithelial lesions (SELs) discovered on upper endoscopy (EGD), followed by surveillance if no high-risk features are identified. However, limited data are available on the impact of and compliance with surveillance recommendations.

**Objective:** To determine the natural history of SELs < 30 mm in size evaluated by EUS and to determine the degree of patient compliance with surveillance recommendations.

**Design:** Prospective registry.

**Setting:** Two tertiary centers.

**Patients:** We studied 187 consecutive adult patients referred for EUS evaluation of foregut SELs.

**Main Outcome Measurements:** Proportion of patients in whom SELs change in size or echo-features and compliance with follow-up recommendations.

**Results:** Surveillance was recommended in 65 patients with hypoechoic SELs (44.6% women, age 59.5 ± 13.2 years); of these, 29 (44.6%) underwent surveillance EUS as recommended and were followed for a median of 30 months (range, 12-105). During follow-up, 16 SELs (25%) increased in size, with a mean increase of 3.4 ± 3.9 mm (range, 1-15). No changes in echo-texture of the SELs were observed. One patient was referred to surgery during follow-up (because of SEL growth > 30 mm).

**Limitations:** Short follow-up duration; compliance was a secondary aim.

**Conclusions:** During a median follow-up of 30 months, growth in size was observed in 25% of small foregut SELs. However, change in size was minimal, and only 1 patient was referred for surgery based on surveillance EUS findings. Compliance with surveillance recommendations is poor, with fewer than 50% of patients undergoing surveillance EUS as recommended. (Gastrointest Endosc 2015;81:1378-84.)

Subepithelial lesions (SELs) in the lumen of the GI tract are incidentally identified in approximately 1 in every 300 upper endoscopies.[1] When discovered during endoscopy, SELs pose a diagnostic challenge because optical endoscopy only visualizes the mucosa, and tissue acquisition by mucosal biopsy is of limited value.[2] SELs

*Abbreviations: GIST, GI stromal tumor; IQR, interquartile range; SEL, subepithelial lesion.*

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range from benign lesions (lipoma, duplication cyst) to tumors of variable malignant potential, such as GI stromal tumors (GISTs) and neuroendocrine tumors.[3,4] Cross-sectional imaging, specifically CT, can be used to evaluate SELs; however, evaluation of SELs on cross-sectional imaging is limited by the spatial resolution of the scanner, particularly for smaller lesions. EUS is the preferred modality for evaluation of SELs discovered on endoscopy because it allows for the evaluation of lesion size, layer of origin, and morphologic features; moreover, EUS allows for tissue acquisition from SELs by FNA or tru-cut biopsy sampling.[5,6] Current National Comprehensive Cancer Center guidelines recommend performing EUS to characterize and sample SELs.[7]

Most SELs are mesenchymal tumors of the GI tract, such as leiomyoma and GIST.[3,8] These lesions typically present as a hypoechoic SEL in the second (muscularis mucosa) or fourth (muscularis propria) echo-layers of the GI tract.[6,9] Surgical resection is recommended for lesions with features associated with high malignant potential, such as size $>$ 3 cm and positive staining for CD117/c-kit on immunohistochemistry, irregular outer margins, echogenic foci, presence of cystic spaces, inhomogeneous echo-texture, or pathologic lymphadenopathy on EUS. Surveillance is recommended for smaller lesions ($<$2-3 cm) without high-risk features.[7,10-12] However, this recommendation is based largely on expert opinion, because the natural history of incidentally discovered SELs is poorly understood.[4]

Long-term data with regard to EUS-based surveillance of small, incidentally discovered SELs are limited and based largely on retrospective case series.[13-15] As such, the optimal approach to the EUS evaluation and surveillance of small SELs is unknown. Furthermore, the impact of and compliance with recommended follow-up for SELs is unclear. Our primary aim in this study was to determine the natural history of small SELs discovered incidentally during upper endoscopy and evaluated by EUS. The secondary aims were to determine the degree of patient compliance with surveillance recommendations, describe the diagnostic yield of EUS $\pm$ FNA/tru-cut biopsy sampling in evaluating SELs, and compare SEL size estimation based on EUS, EGD, and CT.

## METHODS

Consecutive adult patients ($>$18 years old) referred for EUS evaluation of foregut SELs at 2 tertiary care centers between August 2008 and August 2012 were invited to participate in this prospective cohort study. Patients were excluded if they were unable to provide written informed consent. Demographic characteristics were recorded before endoscopy. When available, pre-endoscopy CT studies were reviewed and SEL size and radiographic features were recorded. EUS findings and follow-up recommendations were recorded by the attending gastroenterologist at the completion of the procedure on a study data form. Follow-up data were collected by manual review of the institutional electronic medical record. The study was approved by the Institutional Review Board of Washington University School of Medicine/Barnes Jewish Hospital (IRB no. 201104076) and Northwestern University Feinberg School of Medicine.

### Endoscopic and endosonographic examination

All endoscopic procedures were performed by 1 of 6 experienced endosonographers. At the time of EUS examination, all patients first underwent upper endoscopy using an adult gastroscope (GIF-H180; Olympus Medical Systems, Center Valley, Pa). Lesion location was noted and the lesion measured to the nearest millimeter using an Olympus measuring device. EUS examinations were then performed using a radial and/or linear echoendoscope (GF UE 160; Olympus Medical Systems) or with an ultrasonographic mini-probe (12-20 MHz; Olympus Medical Systems), at the discretion of the attending endoscopist. During endosonographic evaluation, the following SEL characteristics were recorded: layer of origin, maximum diameter, regularity of extraluminal border, echo-pattern, and presence of echogenic foci or cystic spaces. While measuring the SEL during EUS, the endosonographer was blinded to the measurement display on the monitor until the measurement was completed.

### Tissue acquisition

Sampling of the SEL was performed at the discretion of the endoscopist, using FNA or tru-cut biopsy or cold "tunnel" biopsy sampling. The diagnostic yield of individual sampling modalities and overall diagnostic yield for tissue acquisition were calculated. During the time of the study, it was our practice to obtain tissue from all SELs $\geq$ 10 mm in size, unless they demonstrated classic EUS features of a lipoma (hyperechoic third-wall-layer SELs) or cyst.

### Treatment algorithm

Patients with SELs $>$ 30 mm or with other high-risk features (irregular outer margins, echogenic foci, presence of cystic spaces, inhomogeneous echo-texture, pathologic lymphadenopathy) were referred for consideration of surgical resection. No surveillance was recommended for clearly benign SELs (hyperechoic third-wall-layer SELs, duplication cysts, biopsy specimen–proven pancreatic rest, or esophageal leiomyoma). The management of gastric leiomyoma $>$ 30 mm in size was not standardized. Annual surveillance was recommended for patients with indeterminate SELs (those not meeting the above-listed criteria).

### Postprocedure surveillance

Follow-up recommendations were discussed with patients immediately after the procedure and when