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Is Endoscopic Ultrasonography Adequate for the Diagnosis of Gastric Schwannomas?

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See "Endosonographic Features of Gastric Schwannoma: A Single Center Experience" by Jong Min Yoon, Gwang Ha Kim, Do Youn Park, et al., on page 548-554.

Gastrointestinal subepithelial lesions (SELs) are masses or bulges covered by normal appearing mucosa and are usually found incidentally during endoscopy.¹ There are various types of gastric SELs, ranging from benign lesions to lesions with malignant potential. Endoscopic ultrasonography (EUS) is the most reliable diagnostic modality for gastric SELs, and provides helpful information for differential diagnosis as well as guidance in clinical decision-making.^{2,3} EUS allows evaluation of the sonographic nature of SELs, including the size, layer of origin, border, echogenicity, and the presence of cystic or echogenic foci. Typical EUS features may lead to specific diagnosis in cases of a cyst or lipoma.⁴ However, the accuracy of EUS alone is limited in the diagnosis of gastric SELs, especially in differentiating hypoechoic lesions, and preoperative differential diagnosis is often difficult.⁴

The mesenchymal tumors originating from the fourth sonographic layer (muscularis propria) include leiomyoma, gastrointestinal stromal tumors (GISTs), and schwannomas. The differentiation of these tumors is crucial because GISTs have malignant potential, whereas most leiomyomas and schwannomas follow benign clinical courses.

The diagnosis of GISTs is supported by immunohistochemical staining for CD117, the protein product of the c-kit proto-oncogene.⁵ However, the acquisition of tissue for histopathologic diagnosis is not always satisfactory.⁶ In line with this, there have been reports regarding characteristics of GISTs and sonographic features predictive of malignant potential such as size, irregular margins, internal cystic spaces, presence of echogenic foci, and presence of lymphadenopathy.^{7,8} In contrast, only a few studies have evaluated the endosonographic characteristics of gastric schwannomas.⁹⁻¹¹

In this issue of *Clinical Endoscopy*, Yoon et al.¹² evaluated EUS findings of 27 gastric schwannomas that were confirmed pathologically after surgical resection. Most cases were asymptomatic and usually discovered incidentally during screening endoscopy. They analyzed 14 EUS features including the location, echogenicity, homogeneity, sonographic layer of origin, growth pattern, the presence of marginal haloes, internal echogenic spots, and lobulated margins. The most frequent location of the tumors was the middle third of the stomach (63.0%). Characteristic EUS features of gastric schwannomas were heterogeneously hypoechoic lesions with distinct borders and marginal haloes. Notably, the authors compared the echogenicity of the tumors to that of the surrounding normal proper muscle layer, and 17 lesions (63.0%) exhibited decreased echogenicity. Calcification (3.7%), cystic change (7.4%), and surface ulceration (11.1%) were relatively uncommon findings. Histopathologically, all tumors were S100 positive and 96.3% showed cuff-like lymphoid infiltration at the pe-

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riphery of the tumor.

Gastric schwannomas are relatively uncommon spindle cell tumors usually located in the proximal part of the stomach.¹⁰ They are positive for the S100 protein but negative for smooth muscle markers and kit. Schwannomas are generally benign and show excellent prognosis after surgical resection.¹⁰ On EUS, they appear as heterogeneous, hypoechoic lesions originating from the fourth layer, and their endosonographic appearance is similar to that of leiomyomas or GISTs. The presence of internal hyperechoic foci and marginal haloes has been reported, and these features may reflect pathologic findings such as a peritumoral lymphoid cuff.^{9,11} In the present study, more than three-fourths of gastric schwannomas showed internal hyperechogenic spots and marginal haloes. In addition, meticulous assessment revealed that about two-thirds of gastric schwannomas had decreased echogenicity compared to that of the surrounding proper muscle layer. This result is consistent with previous studies showing that the echogenicity of schwannomas is lower than that of the normal muscularis propria, whereas that of leiomyomas and GISTs is similar or greater.^{2,11} However, these features are not pathognomonic for gastric schwannoma, and the differentiation from GISTs remains challenging. Further study regarding the diagnostic performance of these endosonographic characteristics during preoperative evaluation of mesenchymal tumors can be beneficial.

Although EUS is a valuable modality for the diagnosis of gastric SELs, histopathologic evaluation is essential for definitive diagnosis. Endoscopic forceps biopsies of overlying mucosa are rarely helpful. Tissue for histopathologic evaluation can be obtained by endoscopic resection, EUS-guided fine-needle aspiration or core biopsy, or surgical resection.^{2,3,13} SELs can be removed completely with endoscopic resection when tumors are located in the mucosal or submucosal layer. Although endoscopic resection can be performed for both diagnostic and therapeutic purposes, it is still controversial whether SELs smaller than 2 cm in asymptomatic patients should be removed.³ EUS-guided tissue acquisition is a safe and useful diagnostic tool that enables immunohistochemical staining. However, diagnostic accuracy of EUS-guided fine-needle biopsy (EUS-FNB) is not satisfactory, and its outcome depends on several factors such as the location of the lesion, endosonographer's experience, equipment or technique used, and availability of an on-site cytopathologist.^{2,6,13-15} In addition, the evaluation of mitotic count and subsequent risk stratification of GISTs by EUS-FNB often failed due to insufficient sample amounts and inhomogeneous distribution of mitoses.

In summary, characteristic EUS features of gastric schwannomas include heterogeneously hypoechoic lesions with distinct borders and marginal haloes that originate from the

proper muscle layer. In addition, comparison of the echogenicity of suspected lesions with that of the surrounding proper muscle layer may be helpful for differential diagnosis; the echogenicity of schwannomas is lower than that of the normal muscularis propria, whereas that of leiomyomas and GISTs is similar or greater. If EUS features strongly suggest gastric schwannomas, watchful waiting or endoscopic resection can be attempted instead of surgical resection. Further study regarding the diagnostic performance of endosonographic characteristics during preoperative evaluation of mesenchymal tumors is needed. More accurate, safe, and less expensive methods for tissue diagnosis of SEL are still needed.

Conflicts of Interest

The authors have no financial conflicts of interest.

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