Role of Endoscopy in the Diagnosis of Upper Gastrointestinal SET

Hang Lak Lee
Department of Internal Medicine, Hanyang University Hospital, Seoul, Korea

Introduction

Subepithelial tumors (SETs) are occasionally found in the esophagus and stomach during upper endoscopy. Most SETs are asymptomatic and therefore clinically insignificant. However, SETs do have malignant potential, and therefore it is important to distinguish malignant from benign lesions.

Among gastric SETs, gastrointestinal stromal cell tumors (GISTs) have malignant potentials that are related to tumor size; however, malignancy can occasionally be found in smaller lesions. Endoscopic ultrasound (EUS) can be used to diagnose GISTs preoperatively, although differential diagnosis on the basis of imaging alone is insufficient. However, when used in combination with EUS-guided fine needle aspiration, diagnostic accuracy increases, although the results can be quite variable. Thus, linear type EUS and EUS-FNA needles must be used for EUS-guided biopsy, and there are some limitations when SETs are small. Therefore, we performed endoscopic biopsy of gastric SETs using the ESD technique. Now, we introduce the role of endoscopy in diagnosis of SETs.

1. Limitation of EUS finding in diagnosis of SET

Currently, EUS is used to diagnose SETs. EUS enables providers to evaluate the size, layer of origin, delineation, and echogenic pattern of the lesions. Treatment plans for upper GI SETs are determined by algorithms based on EUS images. Using these algorithms, doctors determine whether upper GI SETs should be monitored, endoscopically resected, or surgically removed. However, EUS alone may not be able to diagnose and evaluate upper GI SETs with sufficient accuracy. Larger tissue samples are required to increase the diagnostic accuracy of SETs. For this purpose, EUS-guided fine needle aspiration (EUS-FNA) and EUS-guided trucut biopsy (EUS-TCB) are currently performed. However, EUS-FNA has a relatively low diagnostic accuracy of 62%, and does not always provide information upon immunohistochemical (IHC) staining. EUS-TCB may overcome some limitations of EUS-FNA, but also has less than 60% diagnostic accuracy. Although information about both IHC stains and mitosis indexes are needed to develop treatment plans for upper GI SETs, EUS-TCB and EUS-FNA may not provide adequate tissue samples for these detailed pathologic examinations. It is also difficult to obtain adequate tissue samples using jumbo forceps biopsies and bite-on-bite techniques in SETs with a normal overlying surface.

2. Role of endoscopy in diagnosis and management of SET

1) Deep biopsy procedure (Figure 1)

Endoscopic biopsies of SETs were performed using a flex knife (Ji-In Corp, Ltd, Seoul, Korea), IT2-knife (Olympus, Tokyo, Japan), and a standard upper endoscope (GF-260; Olympus, Tokyo, Japan). All patients were administered intravenous midazolam and pethidine before the procedure. One experienced endoscopist performed all procedures on an outpatient basis.

The ESD technique was performed as follows. Approximately 10 mL of epinephrine solution in hypertonic saline sol-
Role of Endoscopy in the Diagnosis of Upper Gastrointestinal SET

Fig. 1. Deep biopsy technique. (A) The upper gastrointestinal subepithelial tumor. (B) Submucosal injection. (C) A 5 mm hole was created using a flex knife. (D) An IT-2 knife was inserted through the hole, and a 5 mm area was dissected. (E) Through the dissected area, multiple endoscopic biopies were obtained using forceps. (F) Clips were applied to the incision site to close and secure the area.

olution (dilution 1:1,000) was injected into the submucosa. Next, a 5 mm diameter hole was created using a flex knife. Through this opening, the IT2-knife was introduced, and an approximately 15 mm diameter round incision was made in the overlying mucosa by a blend electrosurgical current. Next, submucosal dissection was performed with the IT2-knife. We performed multiple endoscopic biopsy when a round submucosal mass was present beneath the submucosal layer. After the procedure, the incisions were closed by clipping.

2) Clinical features of upper GI SETs and Deep biopsy results

In our study, the subjects were divided into two groups: the deep biopsy group (n=40) and the surgical resection group (n=28). Baseline characteristics among the two groups were similar. All patients were in the normal range of complete blood counts and prothrombin levels. The mean age of all 68 patients was 51.9 years (range, 16-72 years), of which 29 (42.6%) were male and 39 (57.4%) were female. In the deep biopsy group, 18 (45%) were male and 22 (55%) were female. In the surgical resection group, 11 (39%) were male and 17 (61%) were female. The mean diameter of SET was 20.3±9.0 mm in the deep biopsy group and 28.7±7.9 mm in surgical resection group, with no significant differences between the two groups. Of the 40 SETs in the deep biopsy group, 35 (87.5%) were located in the stomach (6 cardia, 6 fundus, 15 body, and 8 antrum), 3 in the esophagus, and 2 in the duodenum. Of the 28 SETs in the surgery group, 27 (96.4%) were located in the stomach (4 fundus, 17 body, and 6 antrum), and 1 in the duodenum. Twenty-two SETs in the surgical resection group were located in the 4th layer.

In the deep biopsy group, accurate pathologic diagnosis was made in 36 of 40 patients, and their pathologic diagnoses were as follows: 9 GISTs (22.5%), 12 leiomyomas (30%), 9 ectopic pancreases (22.5%), and 2 lipomas (5%), 2 carcino-
mas (5%), 2 others (5%), and 4 remained undiagnosed (10%) (Table 1). The mean number and size of biopsied samples were 6.6 and 0.23 mm, respectively. The mean procedure time was 13.66 ± 2.9 minutes. Any procedure-related complications were found during or after the procedure.

3) Change of treatment plan according to deep biopsy results

Treatment plans in 14 of 40 patients were changed by the results of deep biopsy via the ESD technique. Thirteen patients, who were diagnosed with benign SETs such as leiomyoma and ectopic pancreas, avoided unnecessary surgical resection. In contrast, a relatively small (<2 cm in diameter) SET was diagnosed as lymphoepithelial carcinoma, and was therefore surgically resected. In 11 patients with leiomyoma, ectopic pancreas, lipoma or Brunner’s gland and in 5 patients with a GIST showing low mitotic index, deep biopsy results helped prolong the monitoring period. In the surgical resection group, 12 of 28 (42.9%) patients with large SETs (≥2 cm in diameter) were postoperatively found to have benign tumors such as ectopic pancreas, leiomyoma, inflammatory myofibroblastic tumor, and schwannoma. So in the endoscopist group (n=40), 0% of cases were underwent unnecessary operation. Whereas in the surgical group (n=28), 42.9% of cases were benign indicating the surgery was unnecessary operation.

Conclusions

Our data indicate that deep biopsy via ESD is a safe modality of high diagnostic yield compared with EUS-FNA in determining the histopathologic features of upper GI SETs, relatively. And pathologic confirmation can be more important than EUS finding. Diagnostic results improve clinical decision making on managing upper GI SETs. It can be recommended that this modality should be considered in upper GI SETs before determining whether tumors should undergo long-term monitoring or surgical resection.

Table 1. Pathologic Results of Deep Biopsy

<table>
<thead>
<tr>
<th>Deep biopsy diagnosis</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GIST</td>
<td>9 (22.5)</td>
</tr>
<tr>
<td>Leiomyoma</td>
<td>12 (30.0)</td>
</tr>
<tr>
<td>Ectopic pancreas</td>
<td>9 (22.5)</td>
</tr>
<tr>
<td>Lipoma</td>
<td>2 (5.0)</td>
</tr>
<tr>
<td>Carcinoma</td>
<td>2 (5.0)</td>
</tr>
<tr>
<td>Others</td>
<td>2 (5.0)</td>
</tr>
<tr>
<td>None made</td>
<td>4 (10.0)</td>
</tr>
</tbody>
</table>

References

13. Cantor MJ, Davila RE, Faigel DO. Yield of tissue sampling for subepithelial lesions evaluated by EUS: a comparison between forceps biopsies and endoscopic submucosal resection[A figure is presented]. Gastrointest Endosc 2006;64:29-34.