Submucosal tumors of the esophagogastric junction originating from the muscularis propria layer: a large study of endoscopic submucosal dissection (with video)

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Background: Given the high morbidity and mortality rates for surgery and the diminishment of quality of life caused by operative resection of the gastric cardia, a minor invasive treatment without loss of curability is desirable for submucosal tumors (SMTs) of the esophagogastric junction (EGJ). Endoscopic submucosal dissection (ESD) has been used successfully for the removal of esophageal or gastric SMTs; however, the EGJ has been regarded as a difficult location for ESD because of its narrow lumen and sharp angle.

Objective: To evaluate the clinical impact of ESD for SMTs of the EGJ arising from the muscularis propria layer.

Design: Single-center, prospective study.

Setting: Academic medical center.

Patients: 143 patients with 143 SMTs of the EGJ originating from the muscularis propria layer.

Interventions: ESD.

Main Outcome Measurements: Complications, en bloc resection rate, local recurrence, and distant metastases.

Results: The average maximum diameter of the lesions was 17.6 mm (range 5 - 50 mm). The en bloc resection rate was 94.4% (135/143). All en bloc resection lesions showed both lateral and deep tumor-free margins, including 20 GI stromal tumors. Perforations occurred in 6 patients (4.2%, 6/143), and metal clips were used to occlude the defect. Four pneumoperitoneum and 2 pneumothorax caused by perforations were resolved with nonsurgical treatment. Local recurrence and distant metastasis have not occurred during a 2-year follow-up.

Limitations: Single-center, short follow-up.

Conclusions: ESD appears to be a safe, feasible, and effective procedure for providing accurate histopathologic evaluations, as well as curative treatments for SMTs of the EGJ originating from the muscularis propria layer. (Gastrointest Endosc 2012;75:1153-8.)

Abbreviations: EFTR, endoscopic full-thickness resection; EGJ, esophagogastric junction; ESD, endoscopic submucosal dissection; GIST, GI stromal tumor; MP, muscularis propria; SMT, submucosal tumor.

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This video can be viewed directly from the GIE website or by using the QR code and your mobile device. Download a free QR code scanner by searching "QR Scanner" in your mobile device's app store.

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Submucosal tumors (SMTs) occasionally are found in the esophagus and stomach during upper endoscopy (overall frequency .3%).[1] However, some such tumors, especially mesenchymal neoplasms—including GI stromal tumors (GISTs)—originating from the muscularis propria (MP) layer, do have malignant potential.[2] In general, the management of SMTs has consisted of a choice of 2 relatively unsatisfactory options: either watchful waiting without a definitive tissue diagnosis or highly invasive surgical resection. However, an important technical advance in endoscopy in the last decade, endoscopic submucosal dissection (ESD), offers the potential for making a major impact on the management of SMTs.

Endoscopic submucosal dissection is a method of endoscopic resection that involves circumferential cutting of the mucosa surrounding the tumor followed by dissection of the submucosa under the lesion. Most experience in this technique has been in the treatment of GI mucosal lesions[3,4]; however, it has also been used to treat SMTs of the upper GI tract in recent years. Although ESD and variations of this technique, such as endoscopic full-thickness resection (EFTR) and submucosal tunneling endoscopic resection, have been successfully performed to remove many esophageal or gastric SMTs,[5-10] the esophagogastric junction (EGJ) has been regarded as a difficult and risky location for endoscopic resection because of its narrow lumen and sharp angle,[11] especially when the tumor originates from the MP layer.

In the past, open or laparoscopic wedge resection has usually been selected for most patients with SMTs of the EGJ. However, operative resection of the gastric cardia in this situation might result in lifelong gastroesophageal reflux disease and lead to diminished quality of life. Thus, a minor invasive treatment without loss of curability, such as ESD, is desirable for SMTs of the EGJ. Previous studies have shown that ESD can be adequately adopted as an effective treatment for superficial adenocarcinomas at the EGJ[11-13]; however, the feasibility of ESD for the removal of SMTs at the EGJ has not yet been investigated, to our knowledge. Thus, we applied ESD for SMTs located at the EGJ and prospectively evaluated the clinical impact of ESD for SMTs of the EGJ arising from the MP layer in a large series of 143 patients.

Take-home Message

- Endoscopic submucosal dissection appears to be a safe, feasible, and effective procedure for providing accurate histopathologic evaluation, curative treatment, and improved quality of life for submucosal tumors of the esophagogastric junction originating from the muscularis propria layer.

PATIENTS AND METHODS

Study design

Referring to the classification criteria of adenocarcinoma of the EGJ proposed by Stein et al,[14] SMTs of the EGJ originating from the MP layer are defined in this study as tumors located within the area 1 cm proximal to, and 2 cm distal to, the junction.

After institutional review board approval, the study included consecutive patients with SMT of the EGJ originating from the MP layer and treated with ESD between March 2007 and June 2011. Informed patient consent was also obtained before the procedures. Patients were considered eligible for ESD when the tumor was 8 cm less and did not show predominantly extraluminal growth as assessed by EUS or CT. Patients who were not included in the ESD treatment group were followed up or referred for surgery.

Outcome measurements

The main outcome measures were (1) complete resection rate, defined as the proportion of tumors removed en bloc, with no apparent residual tumor at the resection site (assessed macroscopically by the endoscopist) and with negative margins on pathologic examination; (2) complication rate; and (3) local recurrence in all patients and also distant metastases in patients with tumors with malignant potential during follow-up.

Procedures

Endoscopic ultrasonography (high-frequency miniprobe, UM-2R, 12 MHz; UM-3R, 20 MHz, Olympus Medical Systems Co, Tokyo, Japan) or CT was performed in all patients to assess (1) the largest tumor diameter, (2) layer of tumor origin, and (3) tumor growth pattern (intraluminal vs extraluminal).

To dissect the tumor, endoscopic submucosal dissection was attempted with a single-channel gastroscope (GIF-H260, Olympus) and an insulated-tip electrosurgical knife (KD-611L, Olympus) or hook knife (KD-620LR, Olympus). Occasionally, a dual-channel gastroscope (GIF-2T240, Olympus) was needed. A transparent cap (D-201-11304, Olympus) was attached to the tip of the gastroscope to provide direct views of the submucosal layer.

Other equipment included an injection needle (NM-4L-1, Olympus), grasping forceps (FG-8U-1, Olympus), a snare (SD-230U-20, Olympus), hot biopsy forceps (FD-410LR, Olympus), clips (HX-610-90, HX-600-135, Olympus; Resolution TM, Boston Scientific, Natick, MA), a high-frequency generator (ICC-200, ERBE, Erbe Elektromedizin GmbH, Tübingen, Germany), and an argon plasma coagulation unit (APC300, ERBE).

Patients were treated under general anesthesia. Prophylactic intravenous antibiotics were introduced 30 minutes before the procedure. After several marking dots were made with a needle-knife around the lesion, a mixture