Laparoscopic wedge resection of synchronous gastric intraepithelial neoplasia and stromal tumor: A case report

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Abstract
Synchronous occurrence of epithelial neoplasia and gastrointestinal stromal tumor (GIST) in the stomach is uncommon. Only rare cases have been reported in the literature. We present here a case of synchronous occurrence of gastric high-level intraepithelial neoplasia and GIST in the body of stomach, close to the cardia. Epithelial neoplasia and GIST were removed en bloc by laparoscopic wedge resection. To the best of our knowledge, this is the first reported case treated by laparoscopic wedge resection. In addition, we also summarized the features of 22 similar cases with detailed information reported in the English-language literature.

INTRODUCTION
Synchronous occurrence of epithelial neoplasia and gastrointestinal stromal tumor (GIST) in the stomach is uncommon. Only few case reports can be found in the literature[1-16]. We present here a case of synchronous occurrence of gastric high-level intraepithelial neoplasia and GIST in the body of stomach, close to the cardia. Epithelial neoplasia and GIST were removed en bloc by laparoscopic wedge resection. To the best of our knowledge, this is the first reported case treated by laparoscopic wedge resection. In addition, we also summarized the features of 22 similar cases with detailed information reported in the English-language literature.

CASE REPORT
A 60-year-old woman was admitted to our department in June 2009 because of epigastric pain for three months. She had no fever, nausea or vomiting, hematemesis or melena, and weight loss. Physical examination showed no abnormalities. Blood biochemistry was within the normal range. Computed tomography (CT) of the abdomen with intravenous contrast demonstrated a soft tissue mass measuring 5 cm × 5 cm in size with a clear borderline near the lesser curvature of the gastric body, which was consistent with a GIST (Figure 1). Gastroscopy revealed a mucosal ulcer about 1 cm in diameter located in the lesser curvature of the stomach, 3 cm away from the cardia (Figure 2). Histological examination of the specimen from the ulcer showed high-level intraepithelial neoplasia with positive Helicobacter pylori.
During laparoscopic exploration, an extramural pedunculated mass, approximately 5 cm in diameter, was located in the lesser curvature of the gastric body. By intraoperative gastroscopic injection of methylene blue, the mucosal ulcer was localized proximate to the extramural tumor, with 2 cm in between. Laparoscopic wedge resection of the two lesions was performed with triple endoscopic linear staplers (Endocutter 60 staple, green cartridge; Ethicon, Endo-Surgery, Cincinnati, OH, USA) (Figure 3). Intraoperative frozen section of the resected margins was free of tumor. The operation time was 150 min and intraoperative bleeding was 50 mL. The postoperative course was uneventful, and the patient was discharged 4 days later. She was followed up and abdominal CT and upper gastrointestinal imaging 6 mo after operation showed no signs of recurrence.

Histopathological examination of the mucosal ulcer revealed high-grade intraepithelial neoplasia (Figure 4A) without lymph node metastasis (0/8), while the extramural mass was verified as a stromal tumor consisted of spindle to ovoid-shaped mesenchymal cells arranged in interlacing bundles or sheets (Figure 4B). The cells demonstrated eosinophilic cytoplasm and single elongated nuclei with a moderate level of mitotic activity (3 mitoses per 50 HPF, H&E stain). Immunohistochemical staining was positive for CD117 (Figure 5A) and CD34 (Figure 5B) but negative for SMA, S-100 and Desmin.

DISCUSSION

The term of GIST was introduced by Mazur et al. in 1983 in order to indicate a distinct heterogeneous group of mesenchymal neoplasms of spindle or epithelioid cells with varying differentiation. GIST occurs from the lower esophagus to the anus, with its most common site in the stomach. However, simultaneous occurrence of GIST and epithelial tumor in the stomach is uncommon. To the best of our knowledge, 44 cases have been reported in the English-language literature. The largest published study consisted of 22 cases, but without detail information.
Table 1  Summary of previous synchronous gastric epithelial tumors and gastrointestinal stromal tumors in the stomach

| No. | Source | Sex/age (yr) | Epithelial tumor Location | Epithelial tumor Size (cm) | Appearance | Histology | GIST Location | GIST Size (cm) | Appearance | Surgical procedure |
|-----|--------|--------------|---------------------------|---------------------------|------------|-----------|---------------|---------------|-------------|------------------|
| 1   | Maiorana et al [1] | F/81 | Cardia | 4 | Exophytic | AC | Fundus | 5 | Intramural mass | Partial gastrectomy |
| 2   | Maiorana et al [1] | F/79 | Antrum | 2 | Erosion | AC | Pylorus | 6 | Submucosal mass | Partial gastrectomy |
| 3   | Maiorana et al [1] | M/75 | Antrum | 4 | Ulcer | AC | Antrum | 5 | Submucosal mass | Total gastrectomy |
| 4   | Maiorana et al [1] | F/79 | Pylorus | 1.2 | Ulcer | AC | Corpus | 5 | Subserosal nodule | Total gastrectomy |
| 5   | Maiorana et al [1] | M/79 | Antrum | 2 | Ulcer | AC | Corpus | 0.6 | Subserosal nodule | Total gastrectomy |
| 6   | Maiorana et al [1] | M/69 | Corpus | 0.6 | Sessile polyp | Carcinoid | Corpus | 5 | Submucosal nodule | Resection of submucosal nodule |
| 7   | Andea et al [2] | F/73 | Antrum | 0.6 | Nodule | Carcinoid | Fundus | 1.2 | Intramural nodule | Antrectomy + wedge resection |
| 8   | Kaffes et al [3] | M/78 | Antrum | Unknown | Slightly raised Ulcerative | AC | Cardia + corpus | 8 | Ulcerative tumor | Total gastrectomy |
| 9   | Liu et al [4] | M/70 | Cardia + corpus | 5.7 | Ulcerative | AC | Cardia + corpus | 0.5 | Subserosal nodule | Total gastrectomy |
| 10  | Bircan et al [5] | M/71 | Antrum | 7.5 | Exophytic | AC | Cardia | 0.6 | Submucosal nodule | Total gastrectomy |
| 11  | Bircan et al [5] | M/77 | Corpus | 5 | Ulcer | AC | Fundus | 2 | Unknown | Unknown |
| 12  | Wronski et al [6] | F/64 | Antrum | 5 | Unknown | AC | Corpus | 1 | Unknown | Unknown |
| 13  | Wronski et al [6] | M/66 | Antrum | 1 | Unknown | AC | Corpus | 1 | Unknown | Unknown |
| 14  | Lin et al [7] | F/70 | Antrum | 1.7 | Ulcerative | AC | Fundus | 1 | Sessile polyp | Subtotal gastrectomy |
| 15  | Uchiyama et al [8] | M/74 | Antrum | 1.5 | Elevated | AC | Corpus | 0.8 | Extramural nodule | LADG + wedge resection |
| 16  | Lee et al [9] | M/82 | Corpus | 1.5 | Ulcer | AC | Corpus | 9.5 | Transmural tumor | Palliative wedge resection |
| 17  | Salemis et al [10] | F/78 | Antrum | 6.5 | Ulcerative | AC | 3 cm to AC | 1 | Nodular lesion | Total gastrectomy |
| 18  | Villias et al [11] | M/78 | Antrum | Unknown | Ulcer | AC | 3.5 cm to AC | 0.9 | Subserosal nodule | Subtotal gastrectomy |
| 19  | Kountourakis et al [12] | F/72 | Unknown | Unknown | Ulcer | AC | Unknown | 1.8 | Subtotal gastrectomy | Proximal gastrectomy + distal esophagectomy |
| 20  | Hsiao et al [13] | M/75 | GIJ | 0.8 | Polyp-like | AC | Near AC | 3.3 | Serosal nodule | Total gastrectomy |
| 21  | Bi et al [14] | F/73 | Fundus | 4 | Ulcerative | AC | Fundus | 4 | Ulcerative | Proximal subtotal gastrectomy |
| 22  | Ozgun et al [15] | M/78 | Antrum | Unknown | Ulcer | AC | Opposite to AC | 10 | Extramural mass | Total gastrectomy |

AC: Adenocarcinoma; LADG: Laparoscopic assisted distal gastrectomy; GIJ: Gastroesophageal junction; GIST: Gastrointestinal stromal tumor.

Figure 5 Over-expression of CD117 (A) and CD34 (B) (200 x). Scale bar = 100 µm.

The remaining 22 cases (12 males and 10 females) at the age of 64-82 years (mean 74.6 years) are listed in Table 1. Of the 22 cases, 20 had adenocarcinoma and 2 had carcinoid.
The simultaneous development of gastric epithelial and stromal tumors, especially two cases of collision tumors composed of gastric adenocarcinoma and stromal tumors, is still difficult to diagnose before operation. In our reviewed cases, simultaneous gastric adenocarcinoma and gastrointestinal stromal tumors were confirmed only in 1 case by histological examination before operation[7]. To increase the preoperative diagnostic rate of synchronous tumors, enhanced abdominal CT scan, gastroscopy and endoscopic ultrasonography have been recommended. Careful exploration of residual stomach intraoperatively is also important to avoid missing GIST when it is too small to be found by image examination.

It has been reported that laparoscopic surgery for early gastric cancer and GIST is safe, valid, and minimally invasive[22-23]. However, rare reports are available on laparoscopic resection of synchronous gastric epithelial tumor and GIST. In our reviewed cases, only 1 case was treated by laparoscopic procedure (laparoscopic-assisted distal gastrectomy + laparoscopic wedge resection)[30]. In our case, complicated lymphadenectomy was not needed for either gastric high-level intrapithelial neoplasia or GIST located in the same region with only 2 cm in distance, that makes laparoscopic wedge resection a optimal choice for the patient. Because of the close location of the lesions to the cardia, care should be taken not to injure the esophageal junction while firing the stapler. Intraoperative gastroscopy is a simple and effective procedure for the complete excision of tumors and intactness of esophagocardial junction.

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