Case Reports

Five Cases of Early Gastric Cancer in the Reconstructed Gastric Tube after Radical Resection for Esophageal Cancer

Kaori Shigemitsu1, Yoshio Naomoto1, Yasuhiro Shirakawa1, Minoru Haisa1, Mehmet Gunduz2 and Noriaki Tanaka1

Departments of 1Gastroenterological Surgery, Transplant and Surgical Oncology and 2Oral Pathology and Medicine, Graduate School of Medicine and Dentistry, Okayama University, Okayama, Japan

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We report seven early gastric cancers in five patients, which arose in the reconstructed gastric tube after radical resection for esophageal cancer. Four of them occurred in the middle gastric tube and three in the distal gastric tube. Three of 5 cases were reconstructed via the retro mediastinal route and two via the presternal route. They all were diagnosed by follow-up endoscopy from 8 months to 5 years after esophagectomy. All of them were treated surgically with partial resection of the gastric tube because they were suspected to have invaded the submucosal layer or large enough to be treated with endoscopic mucosal resection (EMR). Histologically, six of seven were diagnosed as well differentiated adenocarcinoma and one as signet ring cell carcinoma. Although one of them died for reasons other than cancer itself, the others are alive and well without any recurrence. Recently, gastric tube cancer after esophagectomy has been increasingly reported to be accompanied with prolongation of survival of esophageal cancer patients. Total or partial gastrectomy is proposed for surgical treatment of gastric tube cancer, but the operating procedure is complicated and invasive, especially in the case of gastric tube reconstructed via the retromediastinal route. Total gastrectomy is much more invasive because it needs re-reconstruction with other organs. Therefore, it is important to detect the lesion in early stages so as to treat it with minimally invasive surgery such as EMR or partial resection. Hence intensive follow up with endoscopy is necessary after resection of esophageal cancer.

Key words: gastric tube cancer – secondary cancer – early gastric cancer – field carcinogenesis

INTRODUCTION

Gastric tube cancer has been increasingly seen in recent years accompanied by advanced treatment for esophageal cancer which has contributed to the prolongation of patients’ survival. On the other hand, a high incidence of the existence of intraepithelial cancer in the aerodigestive tract in patients with esophageal cancer, which has been explained by the concept of ‘field carcinogenesis’ (1,2), is well known.

We report here five cases of gastric tube cancers among 179 cases who had surgical resection for esophageal cancer and underwent stomach reconstruction from January 1995 to 2000 in our hospital. The five cases with gastric tube cancer are summarized in Table 1.

Staging, gross features and histopathological features of esophageal cancer were according to Ref. 3 and those of gastric tube cancer according to Ref. 4.

CASE REPORT

CASE 1

A 78-year-old man was treated with esophagectomy for stage II esophageal cancer and underwent stomach reconstruction via the presternal route, and was followed up at the outpatient clinic. After 3 years and 6 months, he palpated with tumors in his gastric tube and follow-up X-rays and endoscopy with biopsy revealed a 0–I middle type gastric tube cancer (Fig. 1a) and a 0–IIa type distal gastric tube cancer (Fig. 1b). Partial resection of the gastric tube was performed because both tumors were large enough to be treated with endoscopic mucosal resection (EMR) and both were histologically diagnosed as well differentiated tubular adenocarcinoma which
Early cancer in the gastric tube involved the submucosal layer (Fig. 1c and d). The patient died for reasons unrelated to cancer 13 months after the second surgery.

### Table 1. Five cases of gastric cancer in the reconstructed gastric tube after radical resection for esophageal cancer

<table>
<thead>
<tr>
<th>Case</th>
<th>Age (years)/gender</th>
<th>Esophageal cancer</th>
<th>Reconstruction</th>
<th>Gastric tube cancer location/type</th>
<th>Gastric tube cancer histology</th>
<th>Interval</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>78/M</td>
<td>UtMt 0–IIc</td>
<td>Presternal</td>
<td>Middle 0–I</td>
<td>sm, well, INF β, ly3 vx</td>
<td>3yr 6mo</td>
<td>Partial resection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pT1bN2M0</td>
<td></td>
<td>Lower 0–IIa</td>
<td>sm, well, cancer in adenoma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>69/M</td>
<td>Ut 0–IIc</td>
<td>Retromediastinal</td>
<td>Middle 0–IIc + 0–IIa</td>
<td>sm, well, INFα, ly0 v0</td>
<td>4yr 3mo</td>
<td>Partial resection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pT1aN0M0</td>
<td></td>
<td>Middle 0–IIc</td>
<td>m, well, INFα, ly0 v0</td>
<td>5yr 7mo</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>69/M</td>
<td>Mt 0–IIc</td>
<td>Presternal</td>
<td>Lower 0–IIa</td>
<td>m, well, INFα, ly0 v0</td>
<td>8mo</td>
<td>Partial resection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pT1bN0M0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>66/M</td>
<td>Ae 0–IIc + 0–IIa</td>
<td>Retromediastinal</td>
<td>Lower 0–IIc</td>
<td>m, well, INFα, ly0 v0</td>
<td>5yr</td>
<td>Partial resection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pT1bN0M0</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5</td>
<td>59/M</td>
<td>LtMt 0–IIc</td>
<td>Retromediastinal</td>
<td>Middle 0–IIc</td>
<td>sm, sig, INFα, ly0 v0</td>
<td>4yr 6mo</td>
<td>Partial resection</td>
</tr>
<tr>
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<td></td>
<td>pT2N2M0</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>pStageI</td>
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</table>

**Figure 1.** Endoscopy with biopsy for case 1 revealed (a) a 0–I type middle gastric tube cancer and (b) a 0–IIa type distal gastric tube cancer. (c), (d) Both tumors were histologically diagnosed as well differentiated tubular adenocarcinoma which involved the submucosal layer.

**Case 2**

A 69-year-old man was treated with esophagectomy for stage 0 upper esophageal cancer and underwent stomach reconstruction via the retromediastinal route, and was followed up in our clinic. After 4 years and 3 months, endoscopic surveillance with
biopsy revealed 0–IIa type middle gastric tube cancer (Fig. 2a). The lesion was difficult to treat endoscopically, so on thoracotomy, partial resection of the gastric tube was performed. The tumor was histologically diagnosed as well differentiated tubular adenocarcinoma which involved the submucosal layer (Fig. 2b). At 13 months after the second surgery, case 2 was diagnosed as 0–IIc type middle gastric tube cancer by routine endoscopy (Fig. 2c). The tumor was histologically diagnosed as well differentiated tubular adenocarcinoma which involved the mucosal layer (Fig. 2d). Although the patient was troubled with severe pneumonia after surgery, he recovered and was alive and well 1 year after the third surgery.

CASE 3

A 69-year-old man underwent esophagectomy with presternal gastric tube reconstruction for stage I middle esophageal can-

Figure 2. (a) 4 years and 3 months after esophagectomy, endoscopic surveillance with biopsy for case 2 revealed 0–IIa type middle gastric tube cancer (b) The tumor was histologically diagnosed as well differentiated tubular adenocarcinoma which involved the submucosal layer. (c) 13 months after the second surgery, case 2 was diagnosed as 0–IIc type middle gastric tube cancer by routine endoscopy. (d) The tumor was histologically diagnosed as well differentiated tubular adenocarcinoma which involved the mucosal layer.

Figure 3. (a): Follow-up endoscopy for case 3 revealed a 0–IIa type tumor in the distal gastric tube. (b) The tumor was histologically diagnosed as well differentiated tubular adenocarcinoma which involved the mucosal layer.
Early cancer in the gastric tube

Case 4

A 66-year-old man underwent esophagectomy with intrathoracic gastric tube reconstruction for double early esophageal cancers. After 5 years, he was admitted to our affiliated hospital for treatment of 0–IIc type distal gastric tube cancer and treated with partial resection of the gastric tube via the transabdominal approach. Histological findings revealed that the tumor was well differentiated tubular adenocarcinoma which involved the mucosal layer (Fig. 4). He has been alive and well for 2 years after surgery.

Case 5

A 58-year-old man was treated with esophagectomy for stage III esophageal cancer and underwent stomach reconstruction via the retromediastinal route. After 4 years and 6 months, he was diagnosed incidentally during follow-up endoscopy with biopsy with 0–IIc type middle gastric tube cancer (Fig. 5a). Because the lesion was suspected to have invaded the submucosal layer, partial resection of the gastric tube under left thoracotomy was performed. The tumor was histologically diagnosed as well differentiated tubular adenocarcinoma which involved the submucosal layer (Fig. 5b). No recurrent signs were detected 8 months after surgery.

Discussion

Gastric tube cancer is characterized as not only cancer arising in the remnant stomach but also secondary cancer following esophageal cancer. The incidence of gastric tube cancer after esophagectomy has been reported to be 0.2–1.7% (5,6), which is relatively low. However, recently cancer in the gastric tube has been reported increasingly accompanied with prolongation of survival of esophageal cancer patients (5,7).

In our hospital, we operated on five cases of gastric tube cancer among 179 cases who had surgical resection for esophageal cancer and underwent stomach reconstruction from January 1995 to 2000 (2.8%). In our cases, no metastatic lymph node was detected by preoperative CT scan, so partial gastrectomy were performed on seven cancerous lesions in the five patients. We confirmed the tumor location endoscopically and clipped around the tumor before surgery. We also confirmed the surgical margin to be free from cancer from histological findings on frozen specimens during surgery.
As for surgical treatment for gastric tube cancer, total or partial gastrectomy is proposed. However, the operating procedure is complicated and invasive because it is a secondary operation following esophagectomy (8). Especially surgical resection of cancer arising in the gastric tube performed with reconstruction via the retromediastinal route is troublesome because usually thoracotomy with adhesiolysis is necessary to approach the lesion (6). Among our cases, we had great difficulty in treating case 2, whose cancer was found in the middle gastric tube reconstructed via the retromediastinal route and was difficult to treat endoscopically. We were compelled to approach it by right thoracotomy under severe adhesions and the patient suffered from severe pneumonia after the third surgery. Total gastrectomy is more invasive because it needs reconstruction with another organ such as the colon, jejunum, skin, etc. Therefore, it is important to detect the lesion at an early stage so as to treat it with minimally invasive surgery such as EMR or partial resection. Hence intensive follow up is necessary for the early detection of second cancer in the gastric tube and for improvement of prognosis. We have performed annual endoscopic examinations after esophagectomy and all our cases of gastric tube cancers were found in the early stages. Moreover, the shortest interval from esophagectomy to the detection of gastric tube cancer was 8 months. These data indicate that annual postoperative endoscopy is important.

Synchronous or metachronous double cancers arising in other organs such as the neck and head, stomach or colon are not rare in esophageal cancer patients (9,10). Field carcinogenesis indicates that an area of tissue becomes genomically unstable and predisposes to neoplasia owing to prolonged exposure to carcinogens and results in multiple malignant tumors. Kamikawa et al. reported no significantly increased risk of gastric carcinogenesis in gastric tubes following esophagectomies (11). However, recently, the survival of esophageal cancer patients has been prolonged following advanced treatment for esophageal cancer and secondary cancer arising in the gastric tube has been increasingly seen. Hence the relationship between gastric tube cancer and field carcinogenesis remains to be elucidated.

References