Clinical and Pathological Evaluation of Early Cancer in the Gastric Cardia

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Received for Publication August 31, 1990

Summary: We report 9 rare cases (7 males and 2 females) of early gastric cancer of the esophagogastric junction. From 1976 to 1988, 1308 cases of gastric cancer were resected in our Institute. Of these, 479 (36.6%) cases were early gastric cancer. Among all 479 early gastric cancers, 9 (1.9%) were located within 2 cm of the esophagogastric junction on the lesser curvature and/or posterior wall of the cardia. This represents 11.7% (9/77) of the cases of cancer at the esophagogastric junction. This incidence contrasts with the 39.5% of early cancers elsewhere in the stomach. Overall, 36.6% (479/1308) were early gastric cancer. Eight of these 9 patients were resected through the abdominal approach and one by the thoracoabdominal approach. Seven underwent proximal and 2 underwent total gastrectomy. On microscopic examination, one cancer was m-cancer, and 8 were sm-cancer. Lymphnode metastasis was found to be absent in all 9 cases. The prognosis of cancer of the cardia is generally poorer than that for adenocarcinoma in the corpus or distal stomach. However, cancer recurrence 22-91 months postoperatively was zero in these 9 cases of early gastric cancer at the esophagogastric junction.

Key words: early gastric cancer — gastric cardia — esophagogastric junction — proximal gastrectomy — mortality

Introduction

The prognosis of gastric cancer has improved year by year because of the recent increased detection rate of early gastric cancer due to mass screening examinations, together with advances in radiographic, endoscopic and biopsy techniques. However, the diagnosis of early cancer in the gastric cardia, within 2 cm of the esophagogastric junction, is still extremely rare compared with early diagnosis of cancer in other regions of the stomach.

We report here a review of 9 rare cases with early cardia cancer, and contrast the clinico-pathological features of this cancer compared with those of early cancer in other gastric regions.

Materials and Methods

During the 13 years from 1976 to 1988, 1308 gastric cancers were resected in our department of surgery. Of these, 479 (36.6%) were early gastric cancers. Among these gastric cancers, 9 (1.9%) were located in the gastric cardia.

Early gastric cancer is defined as a carcinoma confined to the mucosa (m-cancer) or submucosa (sm-cancer) of the stomach, with or without lymphnode metastasis. The macroscopic classification of early gastric cancer provided by the Japanese Research Society for Gastric
Cancer (1981) was used. In the present study, early gastric cancers were classified into three fundamental types: elevated, flat and depressed. Mixed patterns of these fundamental types were fairly common, but were categorized according to the most prominent type. Squamous cell carcinomas, malignant lymphomas and leiomyosarcomas were excluded from the present study.

Of the 9 patients with early cardia cancer, 7 were men and 2 were women (a ratio of 3.5:1) with age range 42–84 years (mean 59.0 years), while the male to female ratio was 2.1:1 over all 1308 cases of gastric cancer (mean age 59.6 years).

**Results**

The incidence of early gastric cancer in each cancer location is summarized in Fig. 1. The percentage of early cancer was 43.1% in A, 45.6% in M, 19.6% in C and only 11.7% in the gastric cardia.

All the early gastric cancer locations in the stomach and the extent of esophageal invasion are summarized in Fig. 2. Four (open circles) of 9 cardia cases invaded the esophagus, and the other 5 (closed circles) were non-invading and mainly located on the lesser curvature.

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**Fig. 1.** Incidence of early cancer according to location

**Fig. 2.** Early cardia cancer locations
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(Min). On the other hand, other cancers were located 17.6% in Ant, 42.6% in Min, 25.9% in Post and 13.6% in Maj.

Macroscopic classification of the early gastric cancers at each location are summarized in Table 1. Of the 9 cases of cancer of the cardia, three (33.3%) were elevated, including 2 protruded type and 1 superficial elevated type, and the other 6 (66.7%) were depressed type.

Histological classification of the early cancers by location are summarized in Table 2. Four (44.4%) of the 9 early cardia cancers were well differentiated tubular (tub₁) type, 1 (11.1%) moderately differentiated tubular (tub₂), 3 (33.3%) poorly differentiated (por), and 1 (11.1%) was a mucinous adenocarcinoma (muc) type. There were no statistical differences between the cardia distribution and the distribution of the early cancers in the other regions.

The main cancer location and the percentage of m-cancer are summarized in Fig. 3. M-cancer was observed in 49.5% of those in A, 54.8% in M, 31.9% in C and in only 11.1% of those in the gastric cardia, possibly reflecting the difficulty in finding very early stage gastric cardia m-cancer compared with those in other regions of the stomach, especially A and M regions.

### Table 1

**Microscopic classification of early gastric cancers at each of the four locations defined in Fig. 1**

<table>
<thead>
<tr>
<th>Location</th>
<th>Elevated Type</th>
<th>Flat Type</th>
<th>Depressed Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardia</td>
<td>3 (33.3%)</td>
<td>0</td>
<td>6 (66.7%)</td>
</tr>
<tr>
<td>C</td>
<td>13 (27.7%)</td>
<td>2 (4.3%)</td>
<td>32 (68.1%)</td>
</tr>
<tr>
<td>M</td>
<td>42 (17.7%)</td>
<td>4 (1.7%)</td>
<td>191 (80.6%)</td>
</tr>
<tr>
<td>A</td>
<td>71 (39.4%)</td>
<td>5 (2.8%)</td>
<td>104 (57.8%)</td>
</tr>
</tbody>
</table>

### Table 2

**Microscopic classification of early gastric cancers by location**

<table>
<thead>
<tr>
<th>Location</th>
<th>pap</th>
<th>tub₁</th>
<th>tub₂</th>
<th>por</th>
<th>sig</th>
<th>muc</th>
<th>others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardia</td>
<td>0</td>
<td>4 (44.4%)</td>
<td>1 (11.1%)</td>
<td>3 (33.3%)</td>
<td>0</td>
<td>1 (11.1%)</td>
<td>0</td>
</tr>
<tr>
<td>C</td>
<td>5 (10.6%)</td>
<td>18 (38.3%)</td>
<td>10 (21.3%)</td>
<td>7 (14.9%)</td>
<td>6</td>
<td>0</td>
<td>1 (2.1%)</td>
</tr>
<tr>
<td>M</td>
<td>7 (2.9%)</td>
<td>85 (35.6%)</td>
<td>43 (18.0%)</td>
<td>38 (15.9%)</td>
<td>62</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>A</td>
<td>5 (2.7%)</td>
<td>108 (58.7%)</td>
<td>27 (14.7%)</td>
<td>13 (7.1%)</td>
<td>23</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Fig. 3. Distribution of depth (%m:sm) by location

<table>
<thead>
<tr>
<th>n = 9</th>
<th>n = 47</th>
<th>n = 239</th>
<th>n = 184</th>
</tr>
</thead>
<tbody>
<tr>
<td>sm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m</td>
<td>31.3%</td>
<td>14.4%</td>
<td>49.5%</td>
</tr>
</tbody>
</table>

Cardia | C | M | A
Tumor diameters of the resected specimen by location are summarized in Table 3. Early cardia cancer were smaller in size compared with other regions both in m- plus sm-cancers and in sm-cancers.

The positive lymphnode metastasis rate by location is summarized in Table 4. No lymphnode metastasis was observed in the cases of early cardia cancer.

The nine cases of early cardia cancer are described in Table 5 by age, sex, chief complaint or way to detection, operation, and prognosis. Five of the 9 were diagnosed by routine mass screening examinations, and all 3 of elevated type were found by mass screening. Total gastrectomy was performed in 2 cases, one by the left thoracoabdominal approach. The other 7 underwent proximal gastrectomy with jejunal interposition by the abdominal approach. Two of the 9 died, one because of hepatic failure 14 months postoperatively, and the other of a second primary cancer 65 months postoperatively, both without gastric cancer recurrence. The other 7 are surviving 22-91 months postoperatively to date.

Discussion

The incidence of early gastric cancers has increased to about 50% of gastric cancers in Japan recently (Takeda et al. 1987), as compared with about 10-15% in Europe (Borchard, 1990). However, the detection rate of early cardia cancer is still low, being only 11.7% in our pre-
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sent study and 15.6% in a study by Okamura et al. (1987). In this report, the 9 rare cases of early cardia cancer were reviewed with particular attention to the pathological features, selection of operation and the prognosis. The cardia glands are found within 2 cm, above and below, of the esophagogastric junction line, so cancers in this area are termed gastric cardia cancer.

Early gastric cancer has been divided into 3 major types and 3 subtypes macroscopically (1981). Uchida et al. (1986) have reported that early cardia cancers were 75% (6/8) of the elevated and 25% of the depressed type, macroscopically, and all well-differentiated histologically. However, there were only 33% elevated and 67% depressed type in our present study. While only 44% were well-differentiated with 33% poorly-differentiated adenocarcinomas. Five (56%) of the 9 patients with early cardia cancer were found by routine mass screening examinations.

Histologically, early gastric cancer is defined as a cancer with invasion limited either to the mucosa (m-cancer) or submucosa (sm-cancer), but not extending deeper, and with or without lymphnode metastases. There was only 11.1% m-cancer in the gastric cardia, compared with 55% in M and 50% in A. Also early cardia cancers were smaller in size 2.3±1.4 cm for m- plus sm-cancers and 2.5±1.5 cm for sm-cancer. However, Uchida et al. (1986) reported that in 8 cases of early cardia cancer neither vascular invasion nor lymphnode metastasis was found even in sm-cancer. Accordingly, we can perform a radical resection for early cardia cancer by proximal gastrectomy and upper perigastric lymphnode (Group 1) dessection with lymphnode dissection around the left gastric artery (Group 2), preserving the body and tail of the pancreas and the spleen (Group 2 lymphnodes).

The prognosis of cardia cancer is generally poorer than that for adenocarcinoma in the corpus or distal stomach due to the difficulty in detecting the cancer early in this area, resulting in a high proportion of advanced cardia cancers with concomitant complex distribution patterns of lymphnode metastasis and infiltration into the adjacent organs (Takeda et al. 1989). However, we have performed 7 proximal and 2 total gastrectomies for early cardia cancers and no cancer recurrence has been observed, demonstrating that one of the most important factors affecting good prognosis may be the early detection by endoscopic early diagnosis, especially through use of the frontviewer endoscope.

References


