The Operative Indications for Proximal Gastrectomy in Patients with Gastric Cancer in the Upper Third of the Stomach

KAZUYA KITAMURA, TOSHIHARU YAMAGUCHI, SATOKI NISHIDA, KAZUHITO YAMAMOTO, DAISUKE ICHIKAWA, KAZUMA OKAMOTO, HIROKI TANIGUCHI, AKEO HAGIWARA, KIYOSHI SAWAI, and TOSHI TAKAHASHI

First Department of Surgery, Kyoto Prefectural University of Medicine, 465 Kawaramachi, Hirokojikajii-cho, Kamigyo-ku, Kyoto 602, Japan

Abstract: While proximal gastrectomy is often performed for early gastric cancer in Japan, it remains unclear whether or not proximal gastrectomy should be performed for advanced gastric cancer. This study was designed to determine the operative indications for proximal gastrectomy in patients with gastric cancer in the upper third of the stomach. A total of 1691 patients with gastric cancer were reviewed retrospectively from hospital records during the period from 1969 to 1994, and the clinicopathologic characteristics of 82 patients who underwent proximal gastrectomy were compared with those of 150 patients who underwent total gastrectomy. Lymph node metastasis along the lower part of the stomach was observed in gastric cancers which had invaded beyond the muscularis propria of the stomach, but not in those confined to the muscularis propria. Three patients with gastric cancer that had invaded beyond the muscularis propria and metastasized to nodes along the lower part of the stomach were cured by total gastrectomy. However, there was no difference in the postoperative survival rates of the patients treated with proximal gastrectomy and those treated with total gastrectomy, irrespective of tumor stage and depth of invasion. Thus, proximal gastrectomy should be performed for gastric cancer when the depth of invasion is confined to the muscularis propria of the stomach.

Key Words: gastric cancer, proximal gastrectomy, lymph node metastasis

Introduction

Proximal gastrectomy is currently accepted by Japanese surgeons as the most preferred method of surgery for early gastric cancer in the upper third of the stomach. This consensus is based upon observations concerning nutritional absorption, the release of gut hormones, and pancreatic exocrine secretion. However, this surgical procedure is not generally performed for advanced gastric cancers in the upper third of the stomach, because these cancers are often complicated by lymph node metastasis along the lower part of the stomach. Nevertheless, although a number of surgeons recommend total gastrectomy for advanced gastric cancer in the upper third of the stomach, definitive evidence that total gastrectomy is superior to proximal gastrectomy, from the perspective of postoperative survival, is lacking. Thus, it remains unclear whether proximal gastrectomy lowers the survival rate of patients with advanced gastric cancer in the upper third of the stomach, compared to total gastrectomy. This study was designed to examine the postoperative prognosis of patients who underwent proximal gastrectomy and to determine the operative indications for the application of this procedure in the treatment of gastric cancer in the upper third of the stomach.

Patients and Methods

Patients

Between 1969 and 1994, a total of 1691 patients with gastric cancer were admitted to our hospital, all of whom were enrolled in this study. Patients with squamous cell cancer and lymphoma were excluded. Of the 1691 patients, 237 (14%) had gastric cancer that was primarily located in the upper third of the stomach. Of these 237 patients, 150 patients underwent total gastrectomy and 82 patients underwent proximal gastrectomy. The clinicopathologic characteristics of these 232 patients were studied retrospectively based on a review of hospital records.
Methods

The macroscopic and microscopic classifications of gastric cancer were based on the general rules for Gastric Cancer Study in Japan. Histopathologic examinations were performed on the primary lesions using serial sections to determine the depth of cancer invasion and other histologic features, and on the resected lymph nodes using three central sections to confirm the presence of metastasis. All resected regional lymph nodes were subject to histopathologic examination. Classification of the station number and grouping of the regional lymph nodes were based on the general rules for Gastric Cancer Study in Japan (Fig. 1).

Statistical Analysis

Cumulative survival rates were calculated by the Kaplan–Meier method, and the generalized Wilcoxon test was used to compare the survival curves of the two groups of patients. Patients who died of diseases unrelated to gastric cancer were excluded from this analysis. Other statistical analyses were performed by the chi-square test. A P value of less than 0.05 was considered to be statistically significant.

Results

Comparative Clinicopathologic Findings

The clinicopathologic findings in 82 patients who underwent proximal gastrectomy were compared to those in 150 patients who underwent total gastrectomy (Table 1). With the exception of tumor stage, there was no statistical difference in macroscopic and microscopic findings between the two groups.

Metastasis in the Lymph Nodes Along the Lower Stomach

To investigate the distribution of positive nodes along the lower stomach associated with gastric cancer in the upper third of the stomach, the records of 147 patients who underwent total gastrectomy with D1 lymph node dissection or more (10) for the treatment of gastric cancer were examined. Lymph node metastases along the lower stomach were found in 27 of the 147 gastric cancers (18.4%), and the frequency of metastases with various depths of invasion was evaluated (Table 2): There were 0 of 12 in gastric cancers confined to the mucosa; 0 of 18 in gastric cancers confined to the submucosal layer; 0 of 13 in gastric cancers confined to the proper muscle; 5 of 34 in gastric cancers confined to the subserosal layer; 17 of 57 in gastric cancers beyond the serosa; and 5 of 13 in gastric cancers invading the surrounding tissue. In short, there was no lymph node metastasis along the lower stomach in gastric cancers which were located in the upper third of the stomach that were confined to the muscularis propria.

Survival

The postoperative survival of patients with gastric cancers in the upper third of the stomach was evaluated by comparing the proximal gastrectomy group with the total gastrectomy group. There was no statistical differ-

![Fig. 1. Station numbers of the regional lymph nodes.](image)

![Fig. 2. Comparative overall survival curves of patients with gastric cancers in the upper third of the stomach.](image)