Review: Gastric Carcinoma in Japan

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Gastric carcinomas in Japan remain one of the major problems in clinical medicine. Diagnosis and treatment of increasing "early carcinomas" should be emphasized. A review of chronological studies of gastric carcinomas has shown several changes in the clinicopathological aspects of gastric carcinomas over the last few decades.

(Key Words: Gastric Carcinoma, Japan, Statistics, World Health Organization)

INTRODUCTION

It has been well documented that Japan has a notoriously high incidence of gastric carcinoma, and gastric carcinomas constitute a considerable portion of clinical medicine in Japan including diagnostic pathology. In this review article, the following major aspects of gastric carcinoma will be discussed with special emphasis on histopathological aspects.

1) Reported incidence of gastric carcinoma in Japan
2) Clinicopathological description of gastric carcinoma
3) Early gastric carcinoma
4) Chronological trends in gastric carcinoma in Japan

1) Incidence of gastric carcinoma in Japan

The incidence of gastric carcinoma is notoriously high in Japan, Chile and Finland (AFIP). According to the World Health Organization Statistical Annual—Vital Statistics and Causes of Death (WHO, 1981), the death rate by gastric carcinoma specific for sex and age per 100,000 of the population in Japan, the United States and Denmark in 1979 are shown in Table 1. These figures also indicate the highest mortality rate for gastric carcinoma in Japan. WHO (5) reported that, among the mortality rates of malignant neoplasms in Japan, that of the gastric carcinoma is the highest, followed by lung cancer. Kato et al. (2) have pointed out that the general incidence of gastric carcinoma has decreased and environmental factors, especially food, are stressed as contributing factors in this decrease in incidence (2, 4).

2) Clinicopathological description of gastric carcinoma in Japan

In Japan, the clinicopathological description of gastric carcinomas have been carried out according to the following rules defined by the General Rules for Gastric Cancer Studies in Surgery and Pathology (6).

These descriptions consist of macroscopic and microscopic features. For macroscopic aspects of gastric carcinoma, we follow Borrmann's classification (5) as shown below (Fig. 1). Borrmann's classification is widely used and

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is based on differences in the form of invasion. A special classification for "early carcinoma" is described separately.

For microscopic classification, we utilize the following histological classification defined by the above committee (6) (Table 2). Among the various types, tubular carcinomas (Fig. 2) and signet ring cell carcinomas (Fig. 3) are common. Beside these classifications, the following points are usually emphasized as important clinicopathological parameters (6):

1. Amount of tumor cells
   Medullary, intermediate, scirrhous
2. Pattern of infiltration
   α: Well demarcated
   β: Intermediate
   γ: Poorly demarcated
3. Depth of invasion
   m: Intramucosal
   sm: Submucosal
   pm: Muscle layer
   ss: Subserosal
   se: Exposed to serosal surface
4. Invasion of lymphatics (ly) and vessels (v)
   \[ ly = 0 \ 1 \ 2 \ 3 \]
   \[ v = 0 \ 1 \ 2 \ 3 \]
5. Surgical margins
   aw: distal margin (+, -)
   ow: proximal margin (+, -)
6. Presence or absence of lymph node metastasis
7. Presence of metastasis to other organs, such as the peritoneum (peritonitis carcinomatosa) and liver

Borrmann's classification

Type 1

Type 2

Type 3

Type 4


Fig. 1  Borrmann's macroscopic classification of gastric carcinoma. (from the General Rules for Gastric Cancer Studies in Surgery and Pathology)
Fig. 2  Well differentiated tubular adenocarcinoma of the stomach. (periodic acid Schiff stain × 150)

Fig. 3  Signet ring cell carcinoma of the stomach (periodic acid Schiff stain × 150)
Table 1  Death rates by gastric carcinoma specific for sex and age per 100,000 population

<table>
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<tr>
<th></th>
<th>Sex</th>
<th>Age</th>
<th>0-1</th>
<th>1-4</th>
<th>5-14</th>
<th>15-24</th>
<th>25-34</th>
<th>35-44</th>
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<td>5.4</td>
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From WHO 1981

(3) "Early gastric carcinoma"

At the annual meetings of the Japan Gastroenterological Endoscopy Society in 1962 and of the Japanese Research Society for Gastric cancer in 1963, early gastric carcinoma was defined as carcinomas of the stomach with invasion limited to the mucosa and submucosa. The macroscopic classification for early gastric carcinoma was proposed in 1962 by the Japan Gastroenterological Endoscopy Society as shows in Fig. 4. Histologically early carcinomas are most often tubular or signet ring cell carcinomas (Fig. 5) (3). According to Takagi et al. (1), the incidence of early carcinomas increased to more than 30% of all gastric carcinomas in the 30 years from 1946 to 1975 and the diagnosis of early carcinoma has been stressed to improve the general prognosis of gastric carcinoma.

Type I (Protruded Type)
- Protrusion into the gastric lumen is eminent.

Type II (Superficial Type)
- Unevenness of the surface is Inconspicuous. This is farther divided into 3 subtypes, i.e.
  Type IIa (Elevated Type)
  - The surface is lightly elevated.
  Type IIb (Flat Type)
  - Almost no recognizable elevation or depression from the surrounding mucosa.
  Type IIc (Depressed Type)
  - The surface is slightly depressed.

Type III (Excavated Type)
- An excavation in the gastric wall is prominent.

JAPAN GASTROENTEROLOGICAL ENDOSCOPY SOCIETY, 1962
(From Stomach and Intestine Igakushoin Pub. Co.)

Fig. 4  Schematic drawing of early gastric carcinoma. (Japan Gastroenterological Endoscopy Society, 1962 and Japanese Research Society for Gastric Cancer, 1963)
(4) Chronological trends in Gastric carcinoma

For the last few decades, chronological studies (1) (2) (3) have revealed several points which should be mentioned as chronological trends in gastric carcinoma. In the extensive studies of Takagi et al. (1), the most impressive feature was the increased rate of early gastric carcinoma during the 30 years from 1946 to 1975. Another prominent trend was the peak of age distribution shifting from the 50s to 60s. Concerning the location of the tumor, advanced carcinomas increased in the middle and proximal part of the stomach. Therefore, early diagnosis of carcinoma in this region should be very important. Kato et al. (2) performed statistical analysis of the ratio of differentiated carcinomas to undifferentiated carcinomas (DUR). They reported that the decline in DUR was significant in carcinomas developing in the upper lesser curvature and lower body where intestinal metaplasia is more prone to occur. As they also pointed out, differentiated (intestinal) and undifferen-
tiated (diffuse) types of carcinoma of the stomach develop from the intestinal and non-intestinalized gastric mucosa, respectively. Hirota et al. analyzed the chronological trends of early gastric carcinomas in 1981 (3) and pointed out the following changes: 1) cases older than 70 increased, 2) frequency of early cancers in the lesser curvature decreased, and that in either the anterior or posterior wall increased, and 3) the incidence of well differentiated carcinoma increased among the histological types. These figures indicate some aspects of changes in the nature of gastric carcinomas in Japan which could be related to changes in environmental factors.

Table 2  Histologic classification of gastric carcinomas  
(General Rules for Gastric Cancer Studies in Surgery and Pathology)

1.  Common type
   Papillary adenocarcinoma (pap)
   Tubular adenocarcinoma (tub)
   Well differentiated (tub 1)
   Moderately differentiated (tub 2)
   Poorly differentiated adenocarcinoma (por)
   Mucinous adenocarcinoma (muc)
   Signet ring cell carcinoma (sig)

2.  Specific type
   Adenosquamous carcinoma (as)
   Squamous cell carcinoma (sq)
   Carcinoid tumor (cd)
   Undifferentiated carcinoma (ud)
   Miscellaneous (ms)

REFERENCES