

Metastases to the Stomach from an Anaplastic Thyroid Carcinoma: Report of a Case

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Summary. We report a surgically resected case of metastatic carcinoma of the stomach from an anaplastic thyroid carcinoma. The patient was a 71-year-old woman. First, three elevated gastric lesions with an appearance of submucosal tumor were observed on endoscopy, and on biopsy they were diagnosed as malignant tumors (probably anaplastic carcinoma) of unknown origin. One month later struma appeared, and both gastrectomy and thyroidectomy were performed. An anaplastic carcinoma of the thyroid and its multiple gastric metastases were found through histological examination of the resected specimens. Morphological features of these metastatic gastric lesions resembled those of common gastric metastatic tumors from various organs. Multiple submucosal tumor-like lesions located in the upper and middle third of the stomach indicate the possibility of hematogenous metastases. When these lesions are histologically anaplastic carcinomas, metastases from thyroid cancer should be considered.

Introduction

Gastric metastases from malignant tumors of other organs are infrequent. Previous reports of them are mainly autopsy cases.¹⁻³⁾ We have experienced one, rare, surgically resected case of gastric metastases from thyroid carcinoma. The gastric lesions were first observed on endoscopy, and were histologically diagnosed as malignant tumors of unknown origin. Postoperative histological investigations on the lesions of the stomach and thyroid revealed that they were gastric metastases from an anaplastic thyroid carcinoma.

Frequency, metastatic mode, distribution in the

stomach, and macroscopical and microscopical features of metastatic gastric cancer are discussed in this report.

Clinical course

A 71-year-old Japanese woman was admitted with complaints of right chest and back pain to Saiseikai Niigata Sogo Hospital in February, 1982. She had had a cholecystectomy for cholelithiasis fifteen years before the admission. On physical examination she was slightly mal-nourished and had a slight fever. Struma, lymphnode swelling, skin eruptions, hepato-splenomegaly, and abnormality of nervous system were not observed. Laboratory findings on admission are shown in Table 1. Mild normocytic and normochromic anemia, moderate elevation of erythrocyte sedimentation ratio, and imbalance of electrolytes were noted. The stool was weakly positive for occult blood.

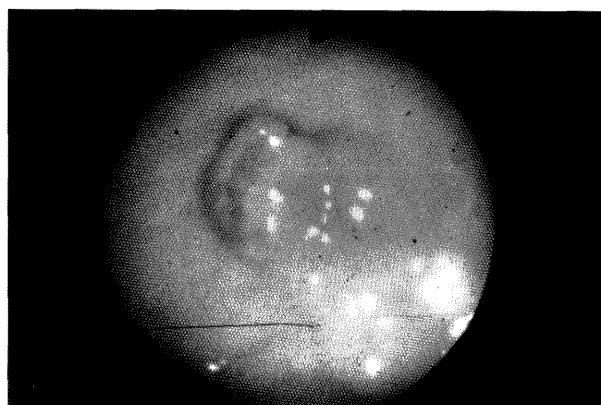
The chest roentgenography revealed bilateral apical calcifications suggesting old tuberculosis. However, there were no abnormalities in abdominal ultrasonography, drip infusion cholangiography, intravenous pyelography, scintigraphy of the liver, or bone marrow aspiration.

The gastroduodenal endoscopy on April 9 revealed three slightly elevated lesions in the stomach (Fig. 1); one located on lesser curvature of the antrum, one on the posterior wall and the remaining one on the anterior wall of the upper body, respectively. They were gradual elevations with a reddish central depression, and were covered with edematous non-neoplastic mucosa.

The biopsy from the lesion on anterior wall of the

Table 1. Laboratory data on admission

CBC		T. P	6.5 g/dl
RBC	330 × 10 ⁴	Protein fraction	
Hb	10.0 g/dl	Albumin	53.8%
Ht	31.2	α ₁ globulin	5.2
Platelet	15 × 10 ⁴	α ₂ "	12.3
WBC	3300	β "	10.7
(St 9, Seg 51, Lym 38, Mon 0, Bas 1)		γ "	18.0
		Total cholesterol	
			190 mg/dl
		Triglyceride	96 mg/dl
ESR	75 mm/h	Na	153.8 mEq/l
		K	3.0 mEq/l
Blood chemistry		Cl	102.0 mEq/l
GOT	11 KU	Ca	8.0 mEq/l
GPT	9 KU	CEA	1.3 ng/dl
LDH	322 IU/L		
ALP	7.2 KAU	Urinalysis	
γ-GTP	11 IU/L	Suger	(-)
Total bilirubin	0.5 mg/dl	Protein	(±)
Direct bilirubin		Urobilinogen	(±)
	0.25 mg/dl	Sediment	normal
Creatinine	1.0 mg/dl		
		Stool occult blood	(±)

**Fig. 1.** Endoscopic findings of the lesion on posterior wall of the upper gastric body. A slightly elevated lesion with central depression is shown.

upper body showed proliferation of large atypical cells in the mucosa (Fig. 2a, b). These cells were scattered mostly singularly or partially in small nests. They had large, hyperchromatic, and pleomorphic nuclei with abundant cytoplasm which was clear

or slightly eosinophilic. Mucin was absent in these cells with periodic acid Schiff reaction or Alcian blue stain. It was not definite whether these tumors were primary or metastatic.

Hoarseness appeared and struma was noticed in the middle of May, when thyroid cancer was suspected. Total gastrectomy and thyroidectomy were performed on May 26.

Pathological Findings

Gastric lesions

Macroscopical findings: Four lesions were recognized; one (lesion A) on lesser curvature of the antrum, one (lesion B) on anterior wall of the upper body, and two (lesion C and D) on posterior wall of the upper body (Fig. 3).

Lesion A elevated gradually and 8 × 6 mm in size. It was covered with non-neoplastic mucosa, and had a pit-like central depression. Lesion B was round, elevated gradually, and 15 × 14 mm in size. It had a wide, brownish central depression, where the normal mucosal pattern had disappeared. Lesion C was a IIc-like lesion measuring 24 × 23 mm. Lesion D was located behind a fold. It was macroscopically similar to lesion B.

Microscopical findings: Lesion B was well demarcated, and located in the mucosa and the superficial submucosa. Its center was eroded, and the tumor tissue was exposed to the lumen (Fig. 4a). Tumor cells were densely populated, and their nuclei were large, round or oval, and frequently had a large, eosinophilic nucleolus. Mitoses and multinuclear cells were also recognized. The tumor was accompanied by severe bleeding and hemosiderin deposition. Chronic inflammatory infiltrates were conspicuous in the stroma, while fibrosis was mild (Fig. 4b). Lesion A and D were similar in histology to lesion B.

Lesion C was diagnosed as a primary signet-ring cell carcinoma limited to the mucosa (Fig. 5). In addition, another signet-ring cell carcinoma (lesion E), 1.3 mm in size, was incidentally found within the mucosa anal to lesion B.

Thyroid lesion

A tumor, 4 × 3 × 2 cm with a large central cyst, arose from the left lobe of the thyroid gland. The tumor was diagnosed microscopically as an anaplastic thyroid carcinoma of giant cell type. It showed prominent bleeding with hemosiderin deposit, invasion into the surrounding tissue, and venous permeation (Fig. 6a, b).

These findings were the same as those of the three lesions of the resected stomach (lesion A, B, D). The

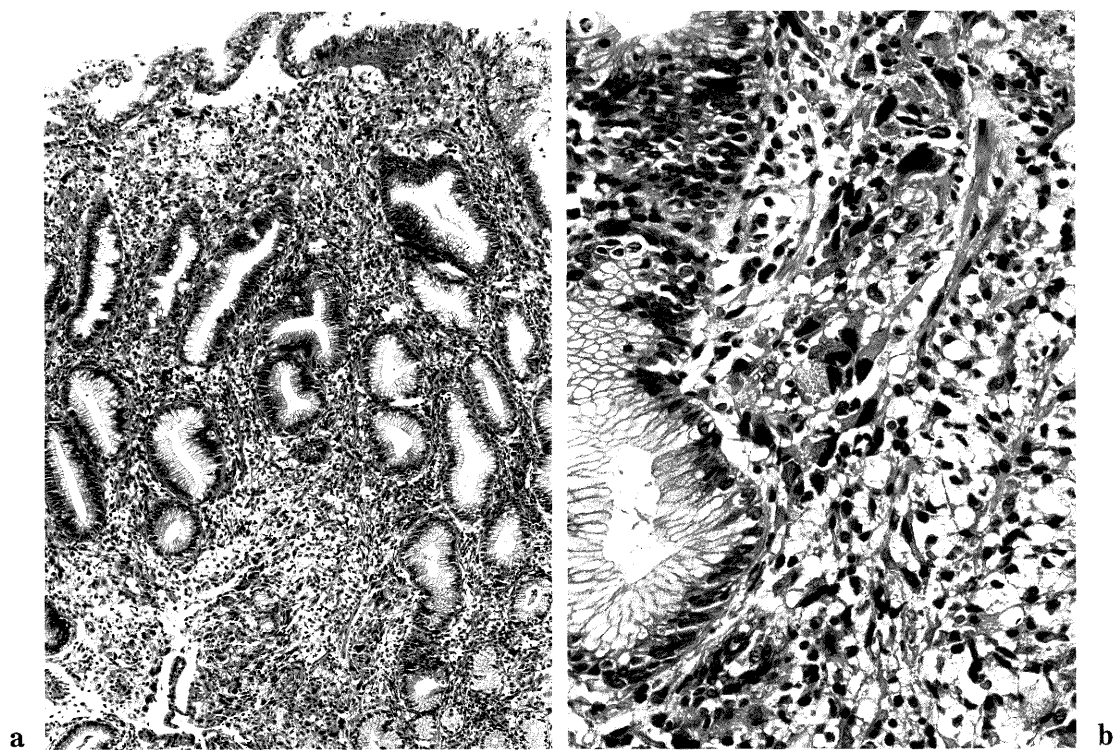


Fig. 2. Photomicrograph of the biopsy specimen obtained from the lesion on anterior wall of the upper body. Atypical cells with large and pleomorphic nuclei are scattered in the mucosa. a: H. E., $\times 70$, b: H. E., $\times 290$

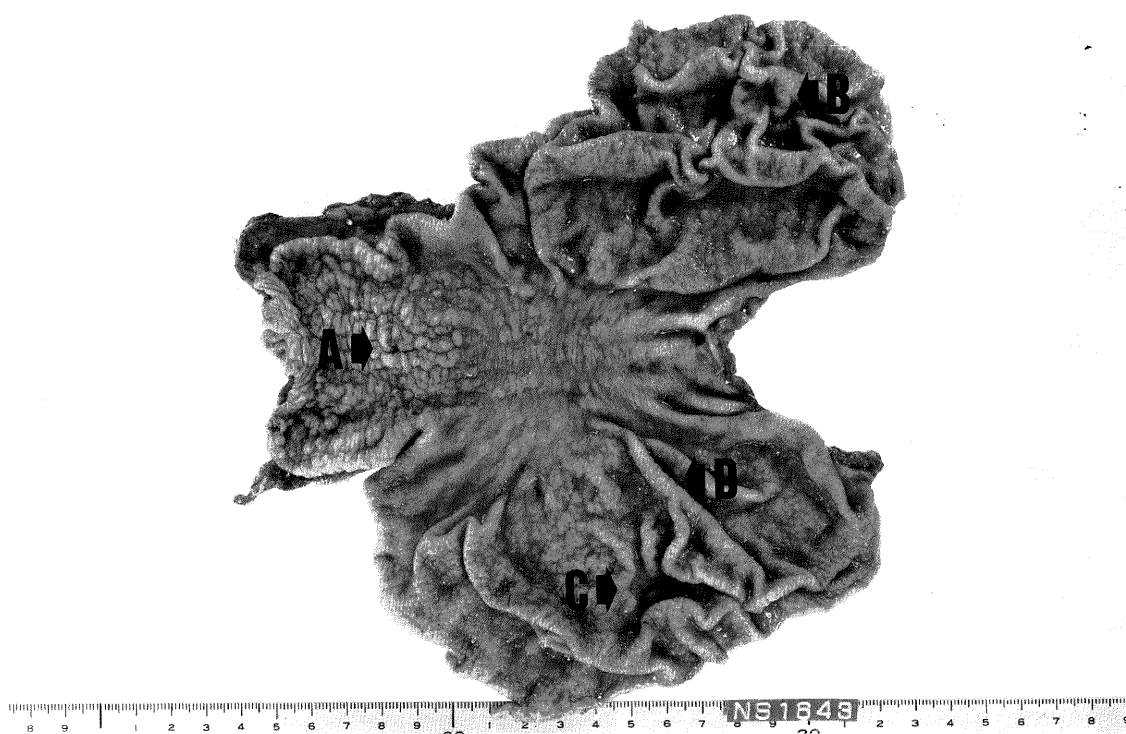
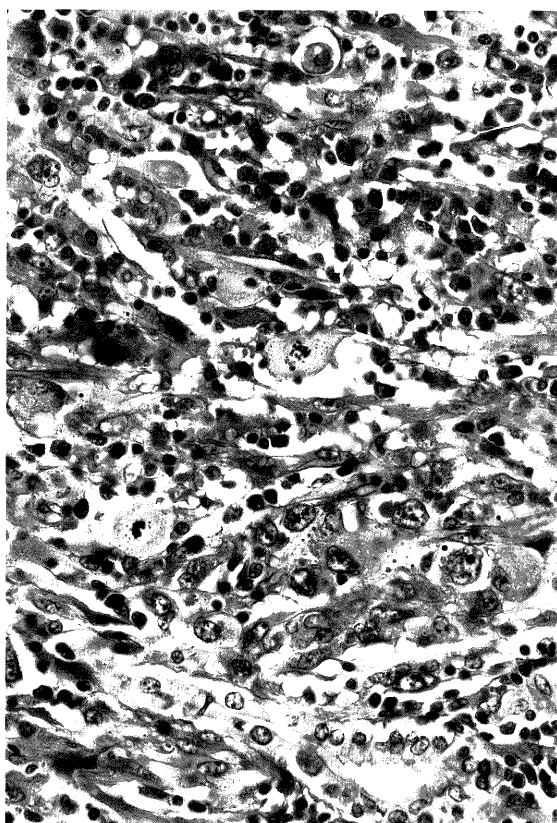


Fig. 3. Macroscopic findings of the resected stomach (after fixation).



a



b

Fig. 4. Photomicrograph of lesion B. a: A well demarcated tumor is located in the mucosa and the superficial submucosa. H. E., $\times 5.7$. b: The tumor cells are large, and have large and pleomorphic nuclei with distinct nucleoli. H. E., $\times 229$

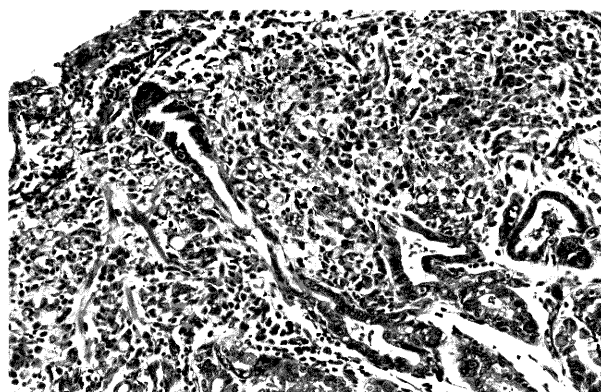


Fig. 5. Photomicrograph of lesion C. Signet-ring cell carcinoma is located in the mucosa. H. E., $\times 115$

schematic distribution of the gastric lesions of this case is shown in Fig. 7.

The patient died of rapid systemic metastases of thyroid carcinoma several months after the second operation.

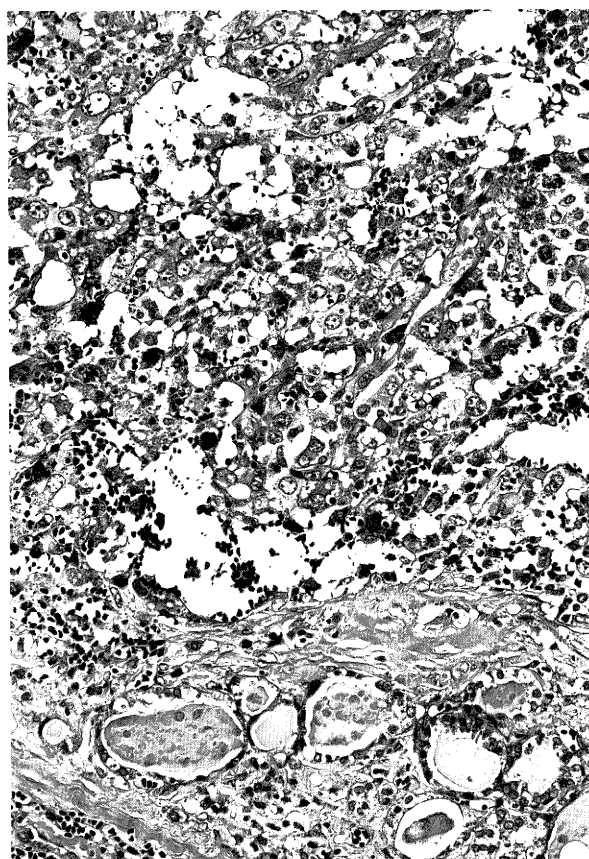
DISCUSSION

Gastric metastases from malignant tumors of other organs are rare, and, according to previous reports, their frequency is 1.7–4.8% in autopsy cases.^{1–3)} The frequency of surgically resected cases seems to be lower, because gastrectomy is performed in only a few cases of metastases. In approximately about 7200 surgically resected stomachs registered in our department from July, 1979 to October, 1988, there were 3 cases of gastric metastases (0.04%).

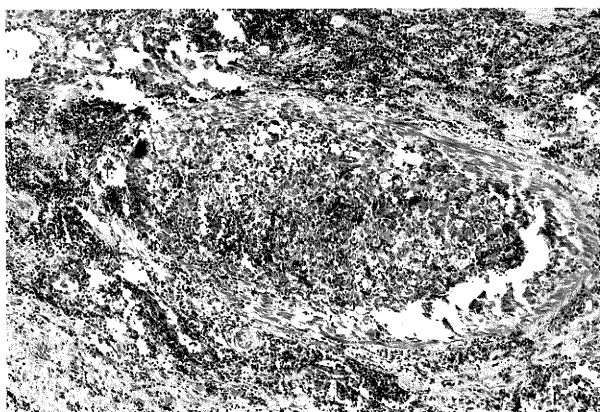
Only 30 autopsy cases of gastric metastases from thyroid cancer (0.4% of total 6672 cases of gastric metastases) were reported in Japan in the 5 years from 1982 to 1986, as shown in Fig. 8.⁴⁾ The incidence of gastric metastases in each primary cancer during the same period is indicated in Fig. 9. The incidence of gastric metastases in thyroid cancer was as low as 1.1%, but it probably depends on the histological type of thyroid cancer.

Anaplastic carcinoma of the thyroid, which involves about 1–10% of thyroid cancer in Japan,⁵⁾ is one of the most malignant tumors. In autopsy cases, Satoh reported 10% gastric metastases among 76 anaplastic carcinomas of the thyroid,⁶⁾ and Heitz et. al. reported metastatic involvement of the gastrointestinal tract in 18 cases among 147 such anaplastic carcinomas.⁷⁾

Metastases to the stomach are categorized into



a



b

Fig. 6. Photomicrograph of the resected thyroid. a: Anaplastic carcinoma of giant cell type. The tumor cells are similar to those of lesion B. H. E., $\times 168$. b: Vascular permeation by the tumor. H. E., $\times 42$

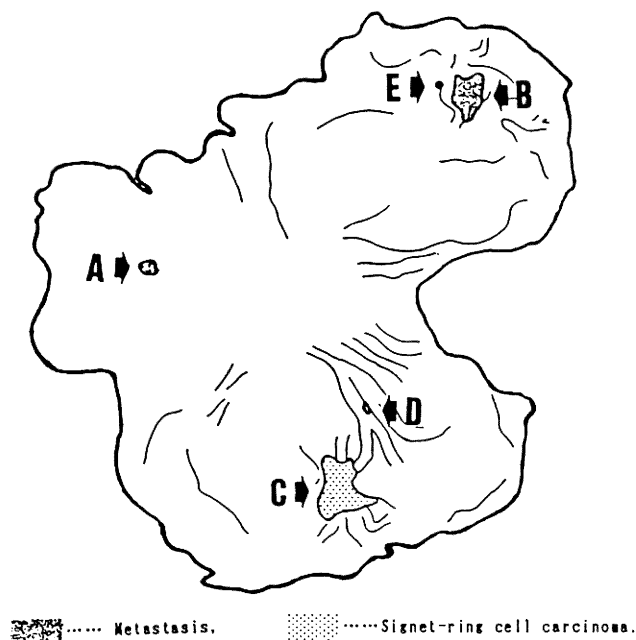


Fig. 7. Schematic distribution of the gastric lesions.

three groups according to each metastatic route, i.e., direct invasion, lymphatic permeation, or blood-borne metastasis. Thyroid cancer is regarded as malignancy metastasizing hematogenously to the stomach, as well as malignant melanoma, carcinoma of the breasts, lungs, or kidneys, and tumors of the testes. Willis collected 139 autopsy cases metastasizing hematogenously to the stomach, including 5 from thyroid cancer.⁸⁾ In our case, microscopically venous permeation was severe in the primary site, suggesting blood-borne metastasis to the stomach.

The distribution in the stomach and the macroscopical and microscopical features of gastric metastases of thyroid cancer have not been described in detail enough to be discussed. This case was discussed in comparison with common metastatic tumors to the stomach from other organs.

According to Sano, metastatic lesions of the stomach, whether single or multiple, are located most in the upper third of the stomach (Cardiac area) and least in the lower third (Antral area).³⁾ Kobayashi reported that the fundic gland area is about 3.9 times as rich in vascular capacity per unit area as the pyloric gland area.⁹⁾ This datum suggests that hematogenous metastasis is more frequent in the former than in the latter. In our case, two metastatic lesions were located in the fundic gland area, while one lesion was in the pyloric gland area.

Menuck et al. classified roentgenographic findings

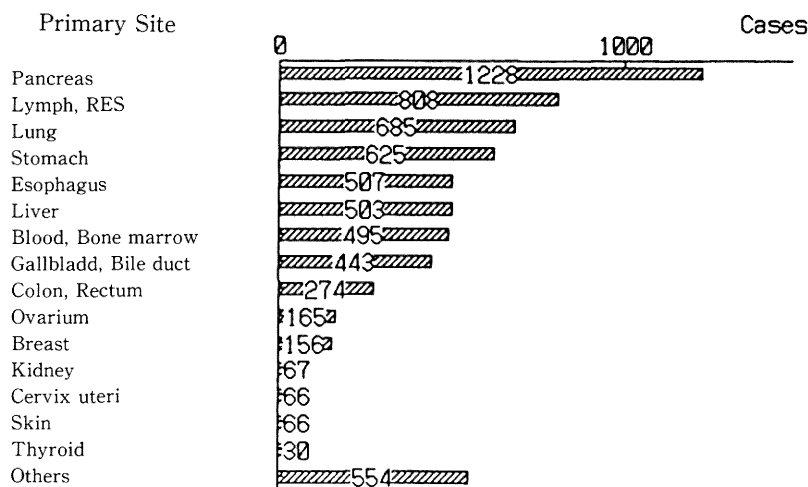


Fig. 8. The frequency of secondary gastric cancer from 1982 to 1986 (from annuals of the pathological autopsy cases in Japan, 1982-1986).

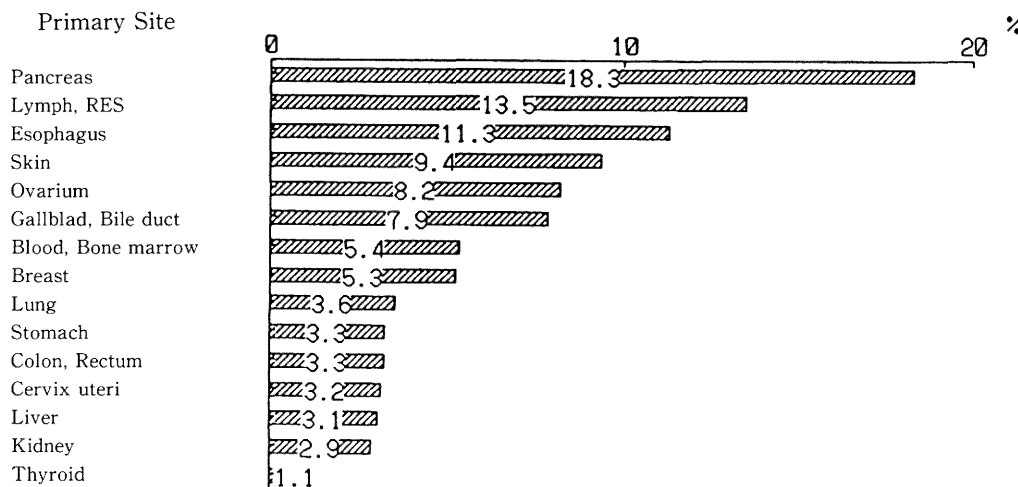


Fig. 9. The incidence of gastric metastasis in each primary cancer from 1982 to 1986 (from annuals of the pathologic autopsy cases in Japan, 1982-1986).

of secondary gastric tumors into the three following types: a solitary polypoid submucosal mass, multiple polypoid submucosal masses, and an infiltrating constricting pattern similar to a "linitis plastica."¹¹ Endoscopically these tumors are said to form a submucosal tumors with central depression or a small verruciform elevation like a "Bull's eye sign."^{10,11} Macroscopically, metastatic gastric tumors generally form circumscribed nodules or plaques like submucosal tumors, and in many cases they show ulceration on their summit.⁸ Extensive capillary plexes are present in the submucosa,¹² and tumor cells transported hematogenously are likely to be caught there, resulting in formation of tumors in the submucosal layer. The gastric metastatic lesions of our case were

completely similar to the findings described above.

Microscopically, most metastatic growths are generally situated initially in the submucosa, and then they enlarge therein and invade the mucosa with subsequent crateriform ulceration. It was the same in our case.

As mentioned above, the distribution in stomach and the macroscopical and microscopical features of gastric metastatic tumors in our case resembled those of common gastric metastatic tumors from various organs except the breast. Multiple submucosal tumor-like lesions (which may be ulcerated or not) located in the upper and middle third of the stomach should be suspected to be hematogenous metastases. And if these lesions are histologically anaplastic carcinomas,

metastases from thyroid cancer should be considered, just as in our case.

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