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CT Findings of Abdominal Metastases from Cancer of the Esophagus

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食道癌の腹腔転移例の CT 所見

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食道癌は腹腔へ転移を来すことが知られているが、その存在診断は困難であり、手術または剖検にて発見されることが多かった。CT は腹部腫瘍病変をよく描出する。しかし食道癌の転移病巣の状態についての報告は未だ少ない。著者等は、CT 導入後6ヵ月間に経験した4例の食道癌(扁平上皮癌)腹腔転移について、CT 所見を報告するとともに若干の文献学的考察を行った。

第1例は53歳男性で、初診時のBa検査で下部食道に原発巣がみられるとともに、胃小弯の圧迫像がみられた。CTにて後腹膜から肝縁に至る巨大な腫瘍病変を発見した。CT像から重複発生か転移か不明であり、試験開腹を行い組織診の結果、転移であることが確定した。

第2例は49歳男性で、食道中部に7cmの食道癌があった。⁶⁰Co 4,000rad照射後摘出した。手

術後8ヵ月にて強い腹痛があり、CT検査を行ったところ、後腹膜から腹壁に広がる非常に広範囲の転移があり、高度の癌浸潤が印象づけられた。

第3例は58歳女性で、食道中部の10cm長の食道癌を⁶⁰Co 4,000radの治療を行った後、摘出した。10ヵ月後、上腹部に腫瘍を触知し、CT検査を行なったところ、後腹膜から前腹部に至る大きな腫瘍形成と、肝転移がみられた。

第4例は67歳女性で、食道中部の3cm長の食道癌を⁶⁰Co 6,000rad照射し、腫瘍は消退した。34ヵ月後、Ba検査で胃噴門下の小弯に潰瘍を発見し、CT検査の結果、胃外の腫瘍が胃壁に浸潤していたものであり、前記潰瘍部に一致して、ガストログラフィンの貯溜がある興味あるCT所見が得られた。

今回の症例は、いずれも転移巣が大きくなった

時点で発見されている。食道癌の治療の基本方針として、初回治療時に発見することが重要であり、今後は、胃、大動脈周囲のリンパ節転移や肝

転移の微細な病変を、CT で発見するよう努力を積み重ねばならないと考えている。

Abstract

Four patients are reported with abdominal metastases from squamous cell carcinoma of the esophagus. The primary tumor of three patients originated in the middle third of the esophagus, one originated in the lower third. Three of the patients had abdominal metastases spreading from the retroperitoneum and one of these spread to the abdominal wall. In one patient metastases spread from the omentum. Computed tomography was an adequate examination method for planning the treatment of esophageal cancer with abdominal metastases.

Introduction

In the period of eight years from 1972 to 1980, abdominal metastases had been found in 60% of 74 esophageal carcinomas at surgery in our hospital (Table 1). Prominently higher incidences were detected in cases with cancers in the lower or middle third of the esophagus. The further study indicated that cases with larger tumor size tended to have more frequent metastases (Fig. 1).

The most common sites of the abdominal metastases were in the regional lymph nodes surrounding the stomach and the abdominal aorta. However, their metastases were often not found before surgery.

Recently the authors examined four patients with abdominal metastases of esophageal cancer. These lesions could be clearly visualized by computed tomography (CT) at the first visit or during follow up studies of the patient.

Since reports on the detection of metastases of esophageal cancer have been infrequent, the CT findings of these four patients are shown with relation to their clinical courses.

CT examinations were performed by a Siemens SOMATOM with a matrix of 256×256, slice of 8 mm and scanning time of 4.5 sec.

Case Reports

Patient 1

This 53 year old man was admitted to the hospital with complaints of dysphagia and weight loss. An intraluminal lesion was found in the lower third of the esophagus on barium examination (Fig. 2A). At the same time, the lesser curvature of stomach was depressed laterally. A squamous cell carcinoma of the esophagus was

Table 1. Frequency of abdominal lymph node metastases (1972-80)

Primary site	Number	Metastases	Rate (percentage)
Cervical	3	0	0
Upper	11	3	27.3
Middle	42	29	69.0
Lower	13	10	76.9
Abdominal	5	2	40.0
Total	74	44	59.5

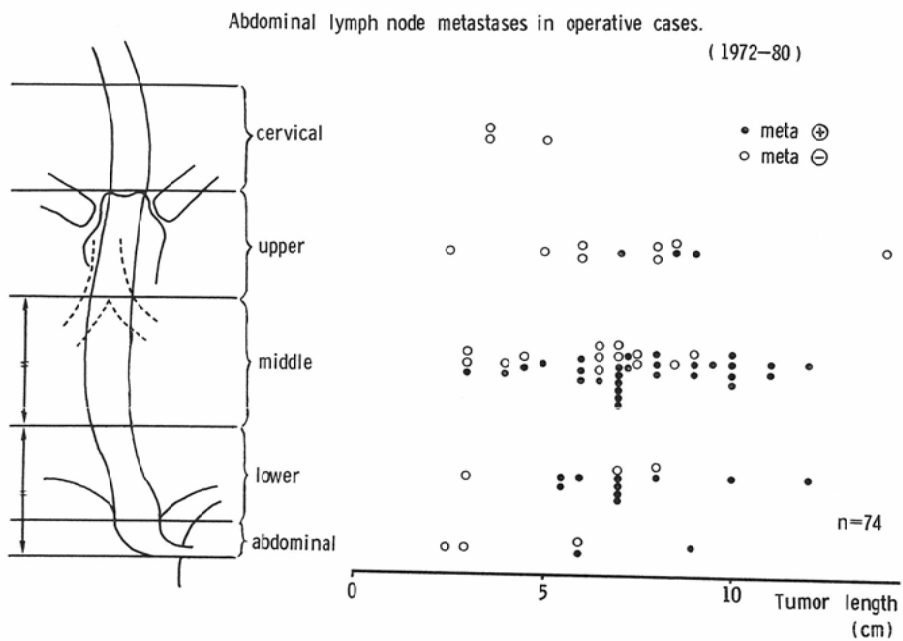


Fig. 1 Abdominal lymph node metastases are shown in relation to the location and the length of esophageal cancers



2A

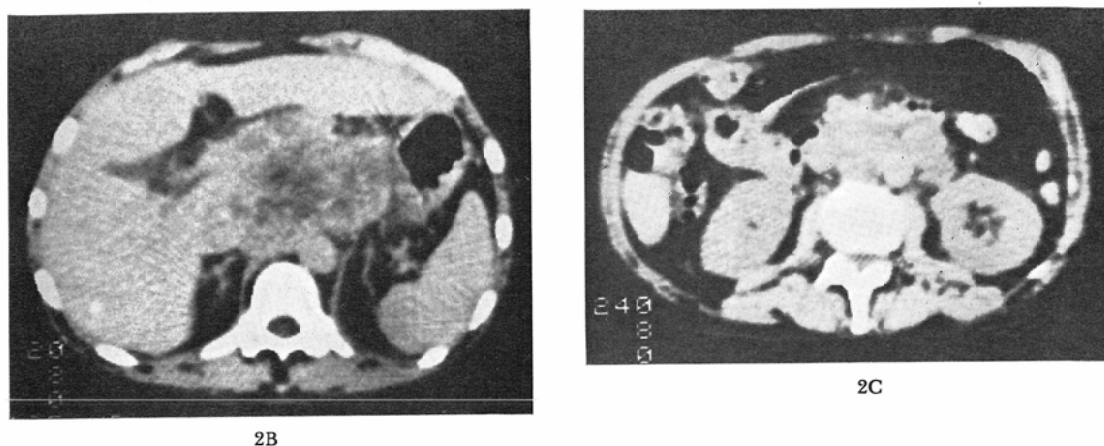


Fig. 2 A 53 year old man (patient 1)

- A. An intraluminal squamous cell cancer can be seen in the lower third of the esophagus. The lesser curvature of the stomach is depressed laterally
- B. A huge metastatic mass extends from the retroperitoneum to the posterior edge of the left lobe of the liver
- C. Enlarged lymph nodes by the metastasis are visualized in the periaortic region on CT

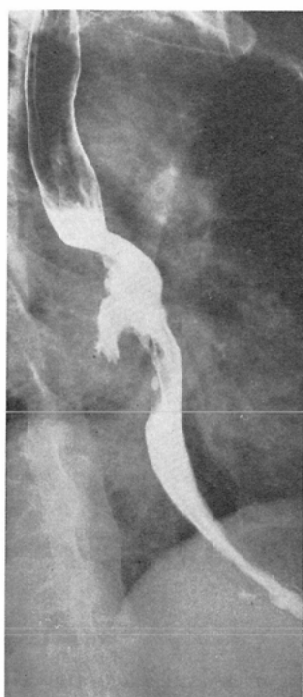
found on endoscopic biopsy. Liver metastases were suspected by a scintigram using ^{99m}Tc -phytate. On CT, a huge mass extended from the retroperitoneum to the posterior edge of the left lobe of the liver. Part of the mass had a low density suggesting necrosis (Fig. 2B). In the lower CT section, the enlarged lymph nodes were found around the abdominal aorta (Fig. 2C). An exploratory laparotomy with histological examination of biopsied material indicated that this tumor developed from the retroperitoneum as a metastases from esophageal cancer. Liver cirrhosis was found, but no metastases was detected in the liver. The tumor could not be resected and the patient died five months after surgery.

Patient 2

This 49 year old man complained of dysphagia. An upper GI examination showed a tumor 7 cm long with a deep ulcer in the middle third of the esophagus (Fig. 3A). Endoscopic biopsy proved it to be a squamous cell carcinoma. The patient was treated by radiation therapy, Co-60 4,000 rad for 3 weeks. The tumor was extirpated following irradiation. However, since metastases to mediastinal lymph nodes were found at surgery, 3,000 rad of additional radiation therapy were given for 3 weeks post-operatively. Four months later, enlarged lymph nodes were found on the right side of the neck. He was treated by radiation therapy, 5,000 rad, to his neck during the next five weeks. Eight months later after extirpation of the primary tumor, he complained of severe pain in the abdomen. On CT examination there was extension of the tumor from the retroperitoneal space to the abdominal wall. The right crus diaphragmatica was destroyed by the tumor (Fig. 3B). Three months later the patient died.

Patient 3

This 58 year old woman complained of dysphagia. On barium examination there was an intraluminal tumor 10 cm long in the middle third of the esophagus (Fig. 4A). She was treated with radiation therapy, Co-60, 4,000 rad, for three weeks. Subsequently the tumor was extirpated. On histological examination it was a squamous cell carcinoma. No abdominal metastases was found at that time. Ten months after discharge from the hospital, she was re-admitted because of a poor appetite. A fist size tumor was palpable in the epigastrium. CT examination showed a huge retroperitoneal mass. The liver was enlarged with multiple metastases (Fig.



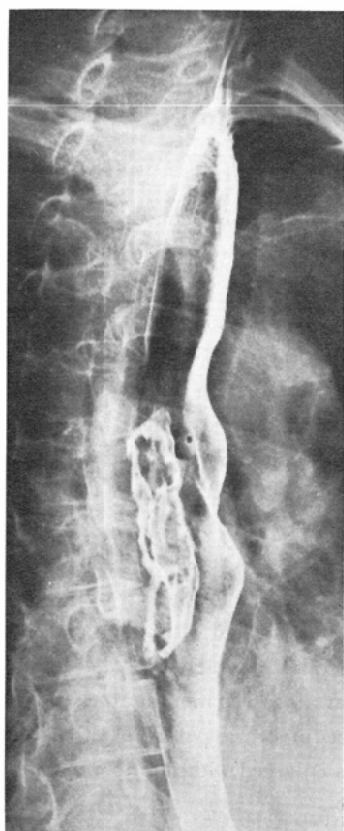
3A



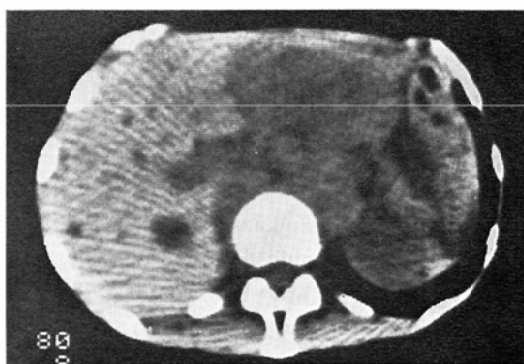
3B

Fig. 3 A 49 year old man (patient 2)

- A. A tumor, 7 cm long, with a deep ulcer in the middle third of the esophagus
- B. On CT examination 8 months after extirpation of the primary tumor, metastases extend from the retroperitoneal area to the abdominal wall. The right crus of the diaphragm and the rib are destroyed by tumor which has a lower density than that of the muscle shadow. There is a pleural effusion in the left thoracic cavity



4A



4B

Fig. 4 A 58 year old woman (patient 3)

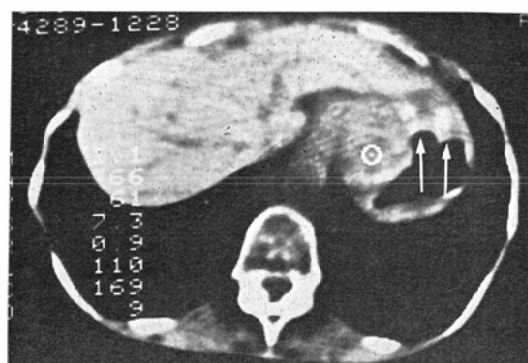
- A. An intraluminal squamous cell carcinoma, 10 cm long can be seen in the middle third of the esophagus
- B. On CT scan 10 months after extirpation of the tumor, a huge metastatic mass occupies the retroperitoneal space. The abdominal aorta is displaced anteriorly. Disseminated metastases are present in the enlarged liver



5A



5B



5C

Fig. 5 A 67 year old woman (patient 4)

- A. A squamous cell carcinoma 3 cm long is present in the middle third of the esophagus
- B. A barium study 34 months after radiation therapy shows a tumor with an ulcer of the lesser curvature of the stomach below the cardia
- C. On CT examination, there is a mass shadow of a metastases in the omentum. The tumor (ring mark) invades the gastric wall and protrudes into the gastric cavity. In the tumor, ulcers are visualized as collections of Gastrografin® administered before the examination (arrows)

4B). She died three months later.

Patient 4

This 67 year old woman complained of dysphagia. On barium examination there was a tumor 3 cm long in the middle third of the esophagus (Fig. 5A). On biopsy the tumor was a squamous cell carcinoma. After irradiation with Co-60, 6,000 rad, the tumor disappeared. On an upper GI examination 34 months later, she had a tumor with an ulcer on the lesser curvature of the stomach below the cardia (Fig. 5B). On CT examination, there was a mass with an irregular density in the abdominal cavity (Fig. 5C). The tumor invaded the gastric wall and protruded into the gastric cavity. In the tumor ulcers were visualized as collections of contrast medium following administration of Gastrografin®.

Discussion

Three of our patients had involvement of the middle third and one involvement of the lower third of the

Table 2. Frequency of metastases of esophageal cancer

	Dormanns (n=824)	Ming (n=48)	Cedermark (n=116) (percentage)
Abdominal lymph nodes	29	42	15.7
Liver	32	25	18.3
Omentum and peritoneum	5	5	8.7

esophagus with squamous cell carcinomas. The three patients with carcinoma of the middle third of the esophagus metastasized to the liver, omentum and retroperitoneum during a period of 8 to 34 months after disappearance of the primary tumor following treatment. In contrast, the one patient with carcinoma of the lower third of the esophagus had metastases to the retroperitoneum demonstrable on the first hospital visit.

Dormanns¹⁾, Ming²⁾ and Cedermark³⁾ have examined the frequency of metastases of esophageal cancers. Their results are summarized in the Table 2. While there are differences in the frequency of metastases among these three reports, the distributions are similar and the frequency of metastases is higher than generally believed. However, as these data are derived from findings at autopsy, data obtained by CT will presumably be different.

Churchill⁴⁾ reported on the relation between the site of esophageal cancer and metastases to the subdiaphragmatic lymph nodes. Eleven of 32 patients with carcinoma of the middle third of the esophagus and eight of 16 with carcinomas of the lower third had involvement of nodes under the diaphragm. In contrast, in 24 patients with cancer in the upper third of the esophagus, only one had metastases to subdiaphragmatic nodes. Humphrey⁵⁾ studied the frequency of metastases in both squamous cell carcinoma and adenocarcinoma of the distal esophagus. In the group of 308 squamous cell carcinomas, 42.2% were localized, 25.9% had lymph node metastases and 31.8% had extension of the carcinoma to other regional tissues. In the group of 284 adenocarcinomas, 19.3% were localized; 46.4% of the patients had positive lymph nodes; and 34.1% had regional extension of the carcinoma.

CT is effective for the detection of mass lesions in the abdomen. In 27 patients with malignancies demonstrable on biopsy of the mesentery or omentum, Levitt⁶⁾ found that 18 had positive findings on CT scans. The nine patients with false negative findings had very small metastatic foci, contiguity with the primary tumor, or a paucity of intraabdominal fat.

The retroperitoneum can be defined anatomically. However, it is difficult to be understood that tumor originates in the retroperitoneal space on CT.

Carter⁷⁾ pointed out that enlargement of the periaortic lymph nodes obscures the margins of the abdominal aorta and vena cava. Indirect signs are also important for confirming the presence of enlargement of lymph nodes. These indirect signs include hydronephrosis caused by ureteral compression, displacement of the aorta or the vena cava, coalescence with the head of pancreas, and displacement of the pancreas, kidney, adrenal and bowel.

Although there are difficulties in the analysis of CT findings, it is a non-invasive, easy and often a helpful examination method for the detection of metastases not only in the mediastinum but also in the abdomen before or during treatment of patients with cancer of the esophagus.

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