



Case Report

A Case of Lung Squamous Cell Carcinoma With Metastases to the Duodenum and Small Intestine

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Gastrointestinal metastasis of lung cancer is fairly rare, and metastasis to the duodenum is very uncommon. We report a case of duodenum and small intestine metastases of lung squamous cell carcinoma. The patient was a 66-year-old man. He was diagnosed with lung squamous cell carcinoma (T4N3M1 [mediastinum, cervical lymph node, and duodenum metastases], stage IV). He noted a sense of abdominal fullness on the evening of the day chemoradiotherapy was given, and emergency surgery was performed for suspected perforation of the digestive tract. Intraoperative findings included a tumor in the small intestine with a perforation at the tumor site; partial resection of the small intestine, including the tumor, was performed. Small intestine metastasis of lung cancer was diagnosed following histopathologic examination. When lung cancer patients complain of abdominal symptoms, it is important to consider gastrointestinal metastases in diagnosis and treatment.

Key words: Lung cancer – Lung squamous cell cancer – Duodenal metastasis – Intestinal metastasis

In lung cancer, distant metastases to the brain, bone, kidney, adrenal gland, and other organs are common, but gastrointestinal tract metastases are fairly rare.^{1,2} Metastases to the duodenum are particularly rare.^{3–6} We report a case of duodenum and small intestine metastases of lung squamous cell carcinoma (SCC).

Case Report

The patient was a 66-year-old man who presented with a chief complaint of abdominal fullness. He had a smoking history of 20 cigarettes per day since the age of 20 years. His smoking index (Brinkman index) was 960. He had been hospitalized in

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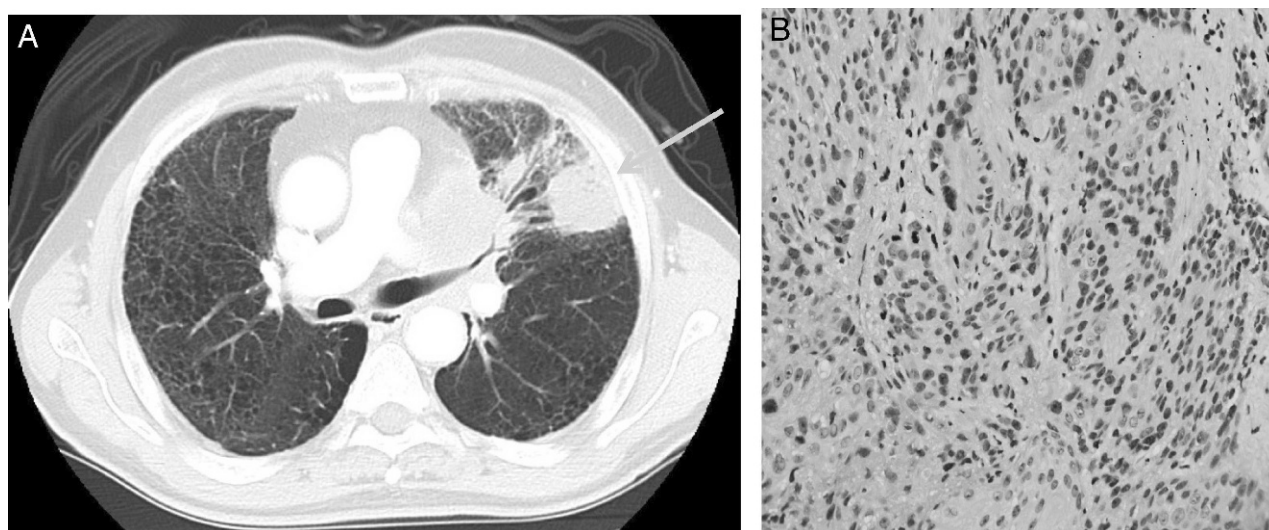


Fig. 1 On chest CT, a tumor lesion with irregular margins extended from the superior lobe of the left lung to the mediastinum (→) (Fig. 1A). Pathologic examination of a biopsy specimen obtained at bronchoscopy revealed squamous cell carcinoma (H&E staining) (Fig. 1B).

February 2010 with loss of appetite and fever. On chest computed tomography (CT), a tumor shadow had been seen in the left lung field, and lung SCC (T4N3M1 [mediastinum, lymph nodes, etc.], stage IV) was diagnosed. Upper gastrointestinal endoscopy had revealed a tumor protruding into the lumen of the third portion of the duodenum, and histopathologic examination of a biopsy specimen led to the diagnosis of metastasis from lung cancer. Surgery was not considered to be indicated, and chemoradiotherapy was performed in March. The patient complained of a sense of abdominal fullness beginning the evening of that day, and these symptoms continued into the next day. Abdominal CT was conducted, and perforation of the digestive tract was suspected. Abdominal distention centered in the lower abdomen was noted, but no spontaneous pain, tenderness, or rebound tenderness was described.

Physical findings included height 162 cm, weight 54 kg, blood pressure 134/80 mmHg, heart rate 105 beats/min, and body temperature 37.6°C. Cervical lymph nodes were palpable. In blood tests, an increased inflammatory response was evident with a white blood cell count (WBC) of 12,000 mm³ and C-reactive protein (CRP) of 8.07 mg/dL; anemia was seen with red blood cell count (RBC) of 378 mm³, hemoglobin (Hb) of 11.5 g/dL, and hematocrit (Ht) of 34.6%. Other values were in the normal range. In terms of tumor markers, carcinoembryonic antigen (CEA) (6.3 ng/mL) and CYFRA (tumor marker for esophageal carcinoma) (48 ng/mL) were elevated, but carbohydrate antigen (CA)19-9 (21.4 U/mL) and

SCC markers (3.6 ng/mL) were not. On chest CT, a tumor lesion with irregular margins was seen extending from the superior lobe of the left lung to the mediastinum. Bronchoscopy was performed, and biopsy revealed SCC (Fig. 1). On abdominal CT, free air was seen on the liver surface and within the pelvis, and edema was noted in the intestinal tract wall (Fig. 2). On upper gastrointestinal endoscopy, a protruding tumor accompanied by an ulcer was seen in the third portion of the duodenum, and SCC was diagnosed from biopsy (Fig. 3).

Perforation of the digestive tract was diagnosed and emergency surgery was performed. The abdomen was opened with a ventral midline abdominal incision. A moderate amount of contaminated ascites was seen on rectovesical excavation. A tumor was located about 150 cm from the ligament of Treitz; this contained a 5-mm perforation site. Partial resection of the small intestine, including the perforation site tumor, was performed, and resected stumps were used as an artificial anus. Small nodules measuring 3 cm were seen 40 cm, 60 cm, and 70 cm from the ligament of Treitz. No peritoneal dissemination was noted (Fig. 4). The resected specimen showed a small intestine tumor measuring 5.2 cm × 1.8 cm with an ulcerated center. Perforation of 0.3 cm × 0.3 cm was seen in the floor of the ulcer. Pathologic examination revealed SCC (Fig. 5). Postoperatively, progressive disease was diagnosed even after irradiation of the left hilar area and systemic chemotherapy. Obstructive jaundice occurred as a result of the duodenal metastatic tumor; bile duct, pancreatic duct stents,

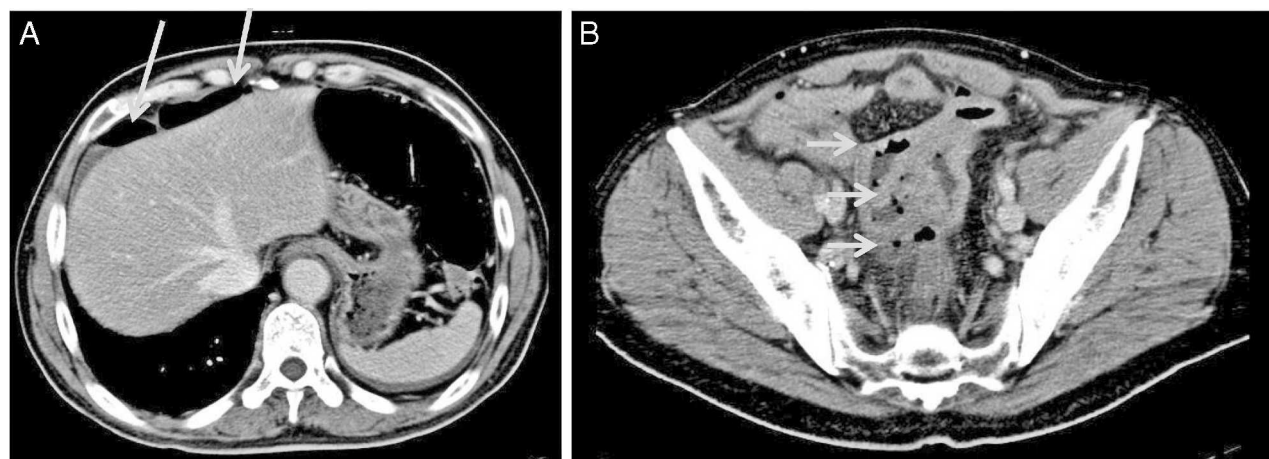


Fig. 2 Free air was seen on the surface of the liver and within the pelvis on abdominal CT (→) (Fig. 2A). Intestinal edema surrounded by free air was noted (→) (Fig. 2B).

and endoscopic retrograde biliary drainage (ERBD) were placed to reduce the jaundice. This patient has survived through 4 months after surgery to remove the small intestine lesion and is receiving systemic chemotherapy and radiation therapy for the duodenal metastatic lesion.

Discussion

In lung cancer, distant metastases to the brain, bone, kidney, adrenal gland, and other organs are thought to occur easily, but metastases to the gastrointestinal

tract are fairly rare.^{1,2} Among them, metastases to the duodenum are very rare.³⁻⁶ Antlar *et al*¹ reported that gastrointestinal metastasis was seen in 14% of lung cancers. The rate of metastasis to the gastrointestinal tract was reported by Abramsra *et al*,⁷ in a study of 1000 autopsy cases, to be 1.7% to the esophagus, 11.9% to the stomach, 11.8% to the colon, and 8.7% to the rectum. Senoo *et al*⁸ reported rates of 4.8% to the esophagus, 2.4% to the stomach, and 6.8% to the small intestine. None of these studies described metastasis to the duodenum. Symptoms such as abdominal pain, vomiting, anemia, and

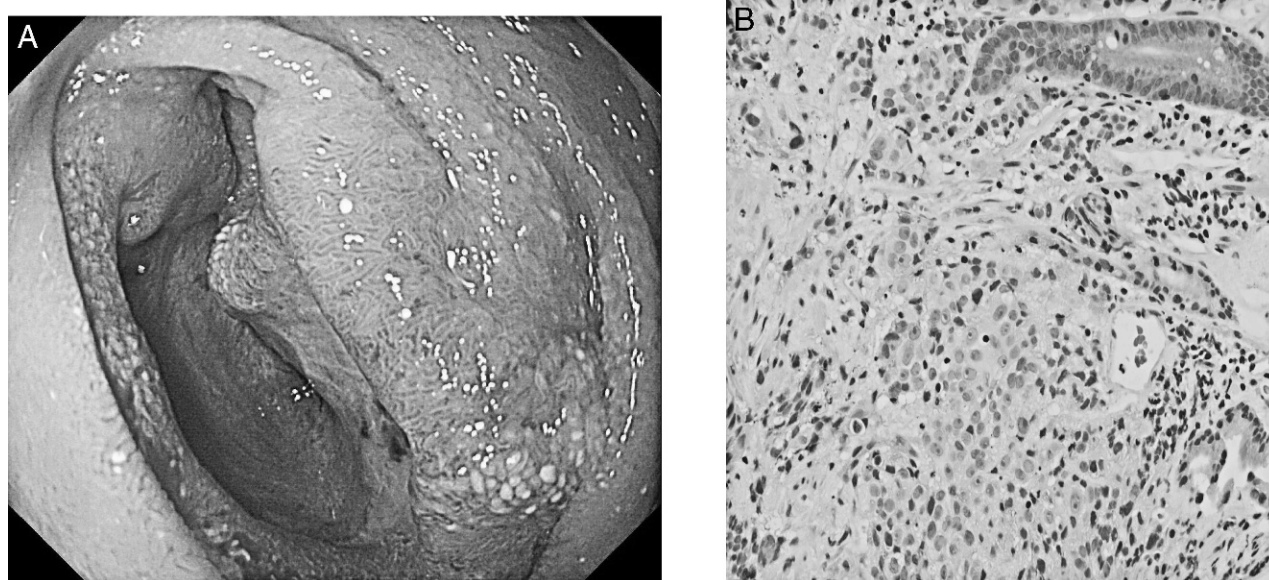


Fig. 3 On upper gastrointestinal endoscopy, a protruding tumor accompanied by ulceration was seen in the third portion of the duodenum (Fig. 3A). Squamous cell carcinoma was diagnosed from biopsy (Fig. 3B).

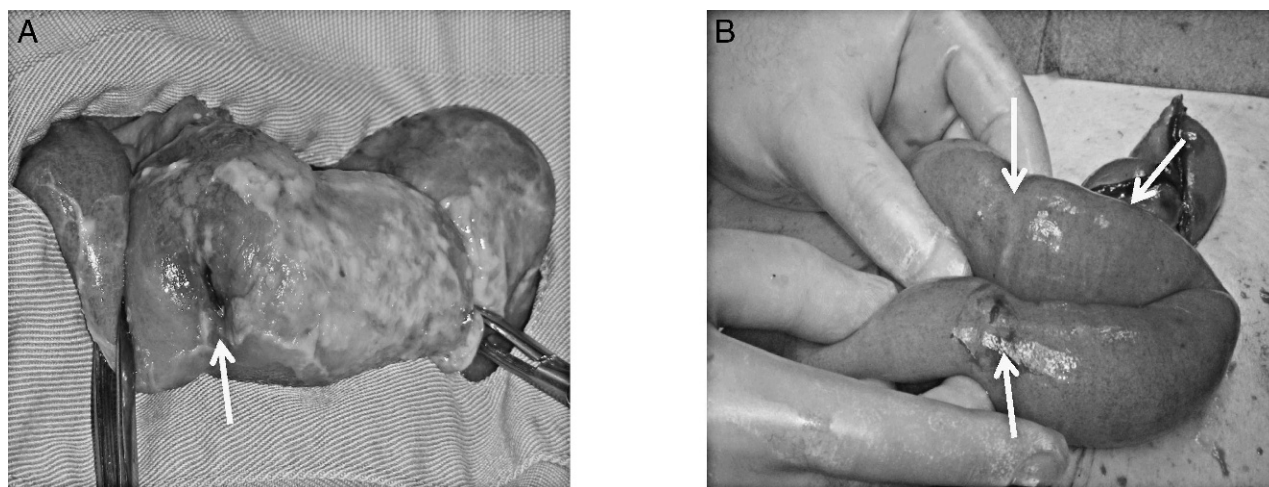


Fig. 4 Operative findings included a tumor about 150 cm from the ligament of Treitz, with a 5-mm perforation site seen in the tumor (→) (Fig. 4A). Small nodules (measuring 3 cm) were seen 40 cm, 60 cm, and 70 cm from the ligament of Treitz (→) (Fig. 4B).

melenas are associated with gastrointestinal metastases,⁶ but often these are not noticed initially, and in many patients, cancer cannot be treated because of late discovery.¹ Regarding the relationship between small intestine metastasis and lung cancer histologic type, Antler *et al*¹ reported relative frequencies of 33% for adenosquamous carcinoma—the most common—as well as 23% for small cell cancer, 20% for large cell cancer, 11% for SCC, and 8% for adenocarcinoma. McNeil *et al*³ showed that large cell cancer was the most common, at 39%, followed by adenocarcinoma (12.3%), small cell cancer (8.0%), and SCC (7.5%).

We conducted a Pub Med search limited to 1999–2007 using the key words “lung cancer” and

“duodenal metastasis,” and, including this case, found original articles on 9 cases^{1,9–13} (Table 1). Patients consisted of 8 men and only 1 woman, whose ages ranged from 46 to 88 years, with a mean age of 67.8 years. Patients were thus concentrated in the middle and elderly years. Histologic type was adenocarcinoma in 3 cases (33.3%), large cell cancer in 2 cases (22.2%), SCC in 2 cases (22.2%), small cell cancer in 1 case (11.1%), and non-small cell cancer in 1 case (11.1%). The chief complaint was anemia in 2 cases, melena in 2 cases, jaundice in 2 cases, and abdominal symptoms in 2 cases. In 1 case, no symptoms were described, and the cancer was discovered in a detailed examination. One case of a single metastasis to the duodenum was reported

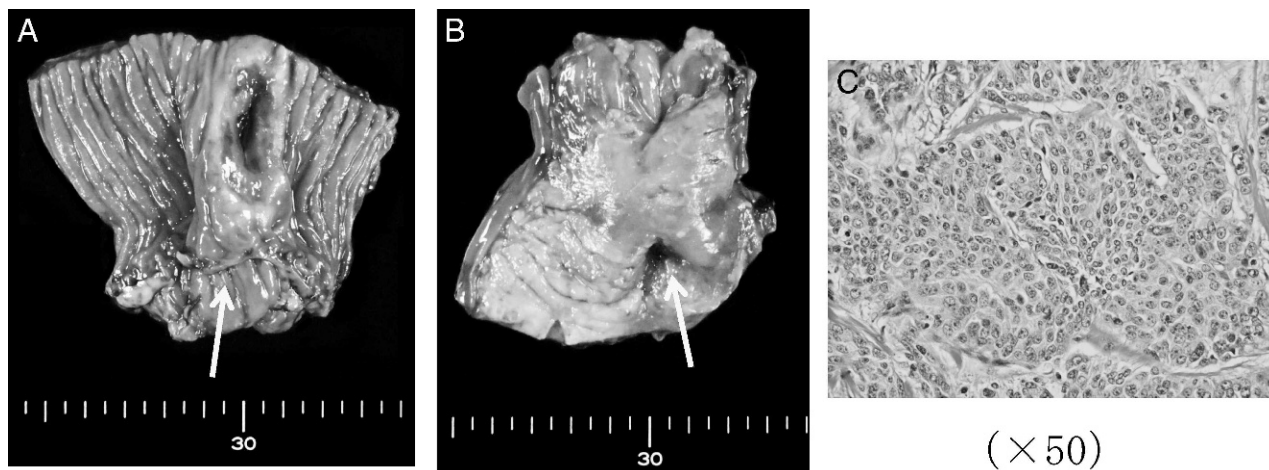


Fig. 5 The resected specimen contained a small intestine tumor measuring 5.2 cm × 1.8 cm with an ulcerated center (→). A 0.3 cm × 0.3 cm perforation was seen in the floor of the ulcer (→) (Figs. 5A, 5B). Pathologic examination revealed SCC (Fig. 5C).

Table 1 Cases of metastatic duodenal tumor of lung cancer

Author	Year	Age/ Sex	Chief complaint	Histologic type	Other metastatic lesion	Therapy for metastatic lesion	Prognosis
Hinosita ⁶	1999	46/F	Anemia	Large	Brain	Operation	Died after 1 year
Kyung-A Lee ⁹	2001	55/M	Jaundice Abdominal pain	Squamous	Bone		Not documented
C. Cremon ¹⁰	2002	88/M	Melena	Large	Liver	None	Died after a few weeks
Nakamura ¹¹	2003	74/M	Anemia	Adeno	Liver, stomach		Not documented
Nakamura ¹¹	2003	59/M	Jaundice	Small	Brain		Not documented
Nakamura ¹¹	2003	81/M	None	Adeno	None		Not documented
Brian KP Goh ¹²	2006	81/M	Dyspnea Lethargy	Nonsmall	Brain, liver	Operation Radiotherapy	Died on the 19th postoperative day
Chrysoula Kostakou ¹³	2007	61/M	Melena	Adeno	Retroperitoneum Para-aortic and mesenteric lymph nodes	Chemotherapy	Died after 7 months
Present case	2010	66/M	Abdominal distention	Squamous	Small intestine	Operation	Alive at 4 months

by Nakamura *et al.*¹ The other 8 patients had metastases to multiple organs.

The general route for metastasis from lung cancer to the gastrointestinal tract has been suggested to be hematogenous metastasis via the spinal veins or lymphogenous metastasis from the mediastinum through the retroperitoneum and mesentery. Smith *et al.*¹⁴ investigated gastrointestinal tract series in 33 cases of metastatic tumor of the small intestine, and reported that well-defined nodular lesions with deep central ulcers were characteristic in 6 cases of hematogenous metastasis. In our patient, the metastasis was thought to be hematogenous because no obvious metastasis to the mesentery or dissemination to the retroperitoneum was seen during surgery, and a well-defined lesion with a central ulcer was found in the resected small intestine specimen.

Resection of the metastatic lesion with bypass surgery was selected as treatment in the present patient, but in many cases, with metastases to multiple organs and other serious complications, treatment is palliative.⁶ Among the cases that we identified, surgery was performed in 3 patients, including the present study, and postoperative radiation therapy was performed in 1 of these cases. Chemotherapy was given in only 1 case. Some reports have indicated increased risk of perforation with chemotherapy and radiotherapy treatments,^{15,16} but in the present case, surgery was conducted after only 1 chemoradiotherapy session. No degeneration or necrosis of tumor cells was seen, and any causal relation was unclear.

With regard to prognosis for small intestine metastasis of lung cancer, Morris *et al.*¹⁷ reported a

mean survival time of 2 months after detection of gastrointestinal tract metastasis in 8 patients, and Wiedermeyer *et al.*¹⁸ recorded a mean survival time of 4 months. In the cases we found, only 1 patient, that of Hinosita *et al.*,⁶ survived for 1 year postoperatively. The patient in the present report is currently alive in the respiratory unit of our hospital about 4 months after surgery undertaken to remove the small intestine lesion; he is receiving systemic chemotherapy and radiation therapy for the duodenal metastatic lesion.

In cases of primary lung cancer with gastrointestinal systems, gastrointestinal tract metastasis should be taken into consideration; these lesions should be looked for and treatment attempted if they are found.

Acknowledgments

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