

## **A Metastatic Jejunal Tumor from Squamous Cell Carcinoma of the Lung Found in an Intestinal Perforation**

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## **Abstract**

An 85-year-old -male with advanced squamous cell carcinoma of the lung, who was diagnosed about ten years prior to his current presentation, suddenly complained of abdominal pain and underwent an abdominal computed tomography (CT) scan, which revealed free air and massive ascites. He was admitted to our hospital for acute peritonitis and emergency surgery was performed. During the surgical procedure, a perforation of the jejunum was diagnosed and repaired. He was diagnosed to have a metastatic tumor originating from a squamous cell carcinoma of the lung. He improved and was transferred to the former hospital on the 27th postoperative day. Jejunal metastasis from squamous cell carcinoma of the lung is rare, and the prognosis of peritonitis due to a perforated intestinal metastasis from lung cancer is poor. There have been ten reports of jejunal metastasis of the squamous cell carcinoma of the lung reported in Japan between 2000 and 2011. Therefore, when patients with advanced lung cancer present with acute abdomen, it is necessary to keep in mind the possibility of a gastrointestinal metastatic tumor.

**Key word:** intestinal metastasis, peritonitis, lung cancer

## **Introduction**

Lung cancer has a high rate of metastasis, and the malignant potential is high. The most common metastatic sites are the other lung (50%), liver (37%), adrenal gland (31%), bone (29%), kidneys (18%), and brain (12%), but the frequency of metastasis to the digestive tract is rare (2.8-8.8%). Furthermore, in various reports, the rate of metastatic intestinal tumors from lung cancer was about 0.1%–3%. The most common histological type resulting in metastasis is large cell carcinoma, followed by adenocarcinoma, small cell carcinoma, and squamous cell carcinoma. A small intestinal metastatic tumor can cause various symptoms, such as obstruction, malabsorption, hemorrhage, and perforation. Therefore, emergency operation may be needed when such symptoms are occurred. However, the prognosis is extremely poor, when intestinal metastasis is found at the condition of perforation. We herein report a rare case of a metastatic jejunal tumor that originated from squamous cell carcinoma of the lung, which was found when the patient developed peritonitis, and was treated successfully with surgery.

## Case report

The present case was an 85-year-old-male patient with a previous history of squamous cell carcinoma of the lung (T1N0M0 Stage Ib) which was diagnosed about ten years prior to his current presentation. He had received stereotactic irradiation (STI) for three months, and for 2 years thereafter he remained stable. During a follow-up examination, it was found that the lung tumor had grown larger and he had also developed a metastatic bone tumor (T4N1M1 stage IV). He received best supportive care and was admitted to a hospital for pain control. However, while in the hospital, he experienced sudden abdominal pain. He was transferred to our hospital with acute peritonitis. At the time of the admission, the patient was 151 cm tall, weighted 43 kg, and his BMI was 18.9 kg/m<sup>2</sup>. His blood pressure was 126/76 mmHg with a heart rate of 89 beats/min, a body temperature of 37.5°C, and a SpO<sub>2</sub> of 98% on room air. A physical examination revealed slight anemia on conjunctival examination, marked abdominal tenderness, and peritoneal irritation. Laboratory tests revealed a WBC count of 7,500 cells/m<sup>3</sup>, a hemoglobin level of 8.7g/dl, a platelet level of 30.0x10<sup>4</sup> cells/m<sup>3</sup>, an albumin level of 3.4 g/dl, a BUN level of 28.3mg/dl, a creatinine level of 0.60mg/dl, and a CRP level of 12.21mg/dl. His transaminase level was normal. In the coagulation test, the prothrombin time was 88.0% (INR: 1.01). In the blood gas test, the results were indicative of alkalosis, with a pH of 7.522, a PaCO<sub>2</sub> of 37.1, a PaO<sub>2</sub> of 78.8, a HCO<sub>3</sub> of

30.3, and a BE of 7.0. A chest X-ray revealed a large tumor in the right lower lung and multiple small nodules in both lungs. A chest CT scan also revealed the same findings as the chest X-rays. An abdominal CT scan revealed free air and massive ascites in the Douglas fossa (**Figures 1A,B**). An upper gastrointestinal series with water-soluble contrast media showed no obvious areas of perforation. Although the site of perforation was not identified, he was diagnosed with acute peritonitis with gastrointestinal perforation and underwent emergency surgery. During the surgical procedure, a large amount of dirty ascites was found. A perforation was revealed about 70 centimeters inside the jejunum from Treiz's ligament (**Figure 2**). An intestinal resection of approximately 40 centimeters was performed. The intraperitoneal cavity was washed with 6000 ml saline solution and a functional end-to-end anastomosis was performed. The operation was completed, and the patient improved gradually. He was transferred to the former hospital on the 27th postoperative day. However, he died about two months after having been transferred. The pathological diagnosis of the resected specimen was a metastatic jejunal tumor from a squamous cell carcinoma of the lung (**Figures 3A-D**).

## Discussion

Lung cancer has a high rate of metastasis, and the malignant potential is high. The most common metastatic sites are the other lung (50%), liver (37%), adrenal gland (31%), bone (29%), kidneys (18%), and brain (12%), but the frequency of metastasis to the digestive tract is rare (2.8-8.8%).<sup>1)2)3)</sup> Furthermore, in various reports, the rate of metastatic intestinal tumors from lung cancer was about 0.1%–3%.<sup>3)4)</sup> Metastatic intestinal tumors from lung cancer present with various symptoms. Takeyoshi et al. reported that the clinical presentation of a metastatic intestinal tumor is most commonly a perforation (35.9%), followed by stenosis (27%), intussusception (21.8%), and melena (15.4%).<sup>5)6)7)8)</sup> In the present case, he was found to have a jejunal perforation and the emergency operation was necessary.

In a histological examination of gastrointestinal metastatic tumors from lung cancer, Ryo et al. reported that metastasis of lung cancer to the digestive tract (excluding the esophagus) was confirmed by surgery or autopsy in 30 of the 1635 lung cancer patients during a 17 year, and that the most common histological type of lung cancer was large cell carcinoma (3.7%), followed by adenocarcinoma (2.4%), small cell carcinoma (1.7%), and squamous cell carcinoma (0.7%).<sup>9)</sup> In the present case, the histological type was squamous cell carcinoma.

The prognosis of metastatic intestinal tumor perforation is especially poor. A metastatic intestinal tumor from lung cancer was demonstrated to occur more often in males than in females, and at a mean age of 64.5 years old.<sup>10)</sup> The 1-year survival rate in patients who undergo surgery for the perforation was 12%.<sup>11)</sup> While the 50% cumulative survival rate for an obstruction was about 3 months, that for a perforation was about 1.7 months.<sup>11)</sup> Because the prognosis of the lung cancer itself is poor and peritonitis further decreases the patient's condition, it was thought that the prognosis of patients who undergo surgery for a metastatic intestinal tumor was especially poor.

<sup>1)2)3)5)</sup> In the present case, the patient died about two month after he was transferred to his former hospital (about 3 months after the surgery).

A perforation due a metastatic intestinal tumor is thought to be caused by ischemia of the intestinal wall resulting from a blood or tumor thrombus, the necrosis of the intestinal wall as a result of chemotherapy, an increase in the intestinal pressure induced by obstruction, and so on.<sup>12)</sup> In the present case, the symptom of obstruction was not present, and the patient was not being treated with chemotherapy. The mechanism responsible for his perforation was therefore thought to be as below: First, the tumor cells from the lung cancer metastasized to the small intestine via the bloodstream. Second, the tumor cells became established in the submucosal layer and started to grow

in the new location. Finally, the center of tumor became relatively ischemic, causing the perforation.

Because of the advances in chemotherapy and supportive care, the survival of lung cancer patients has been increasing. Therefore, it is necessary to pay attention to the symptoms indicative of a metastatic intestinal tumor, such as obstruction, abdominal pain, melena, nausea and so on. If such symptoms appear, it is thought to be possible to improve a patient's QOL by locating the metastatic sites with positron emission tomography (PET) and treating them appropriately, including with surgery when indicated.

Recently, various reports have shown the usefulness of PET.<sup>13)14)15)</sup> If we could effectively use PET in such cases, then we might be able to more accurately predict the presence of intestinal metastatic tumors.

In conclusion, we experienced a rare case of a perforation of an intestinal metastatic tumor caused by lung cancer. To our knowledge, the prognosis of metastatic intestinal tumors from lung cancer is very poor, and the survival rate is extremely low. Therefore, when the patients with advanced lung cancer develop an acute abdomen, it is necessary to keep in mind the possibility of a gastrointestinal metastatic tumor and to appropriately diagnose and treat the acute abdomen.



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## Figure Legends

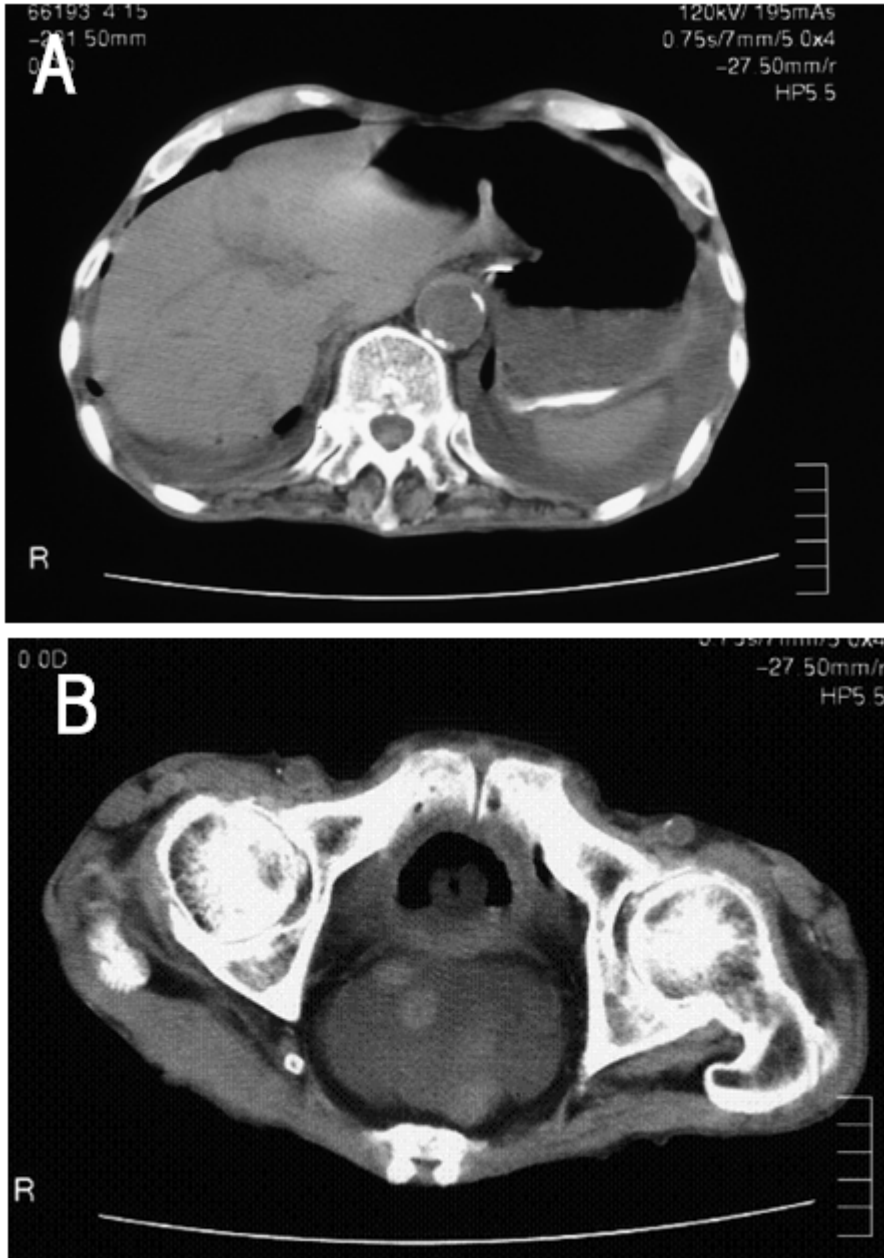


Figure.1: CT images.

A: CT scan of the abdomen.

Free air was revealed in the upper abdominal cavity.1A and massive ascites in

B: CT scan of pelvis.

Massive ascites was shown.

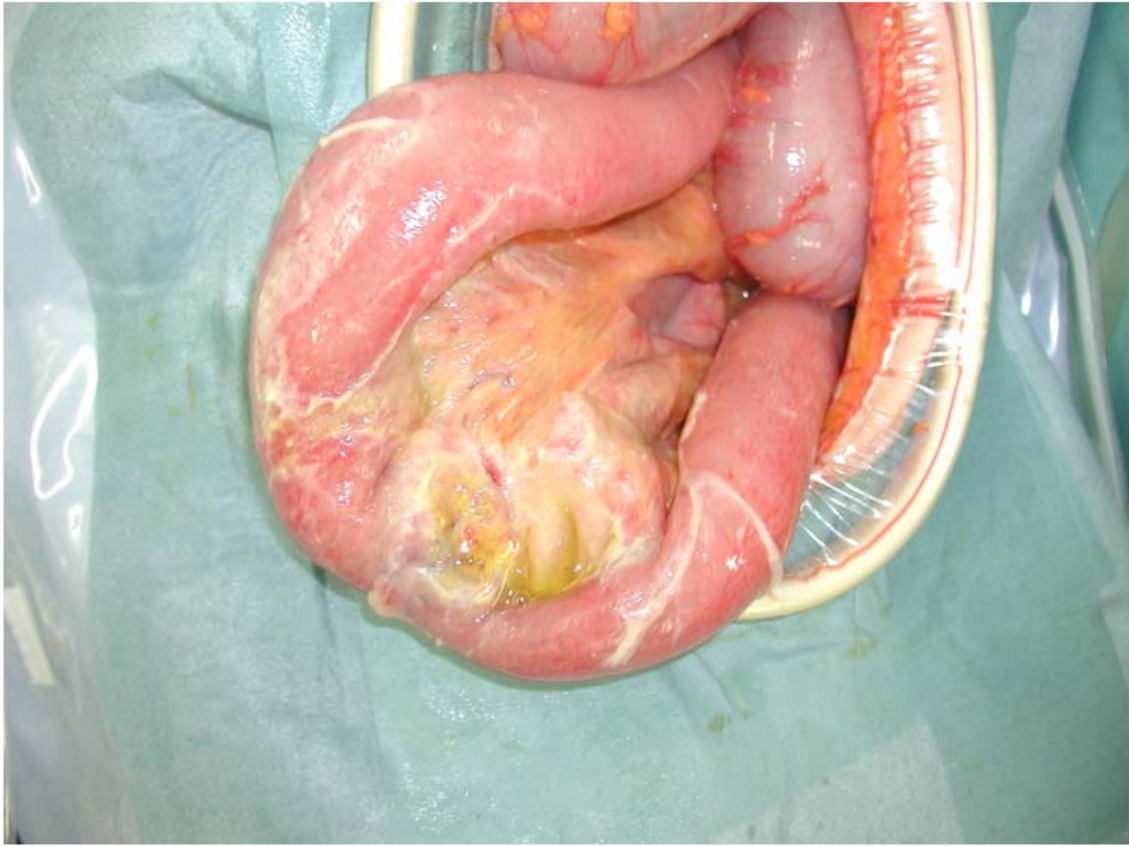


Figure. 2 : The surgical findings.

A perforation located 70 centimeters from Treiz's ligament was revealed.

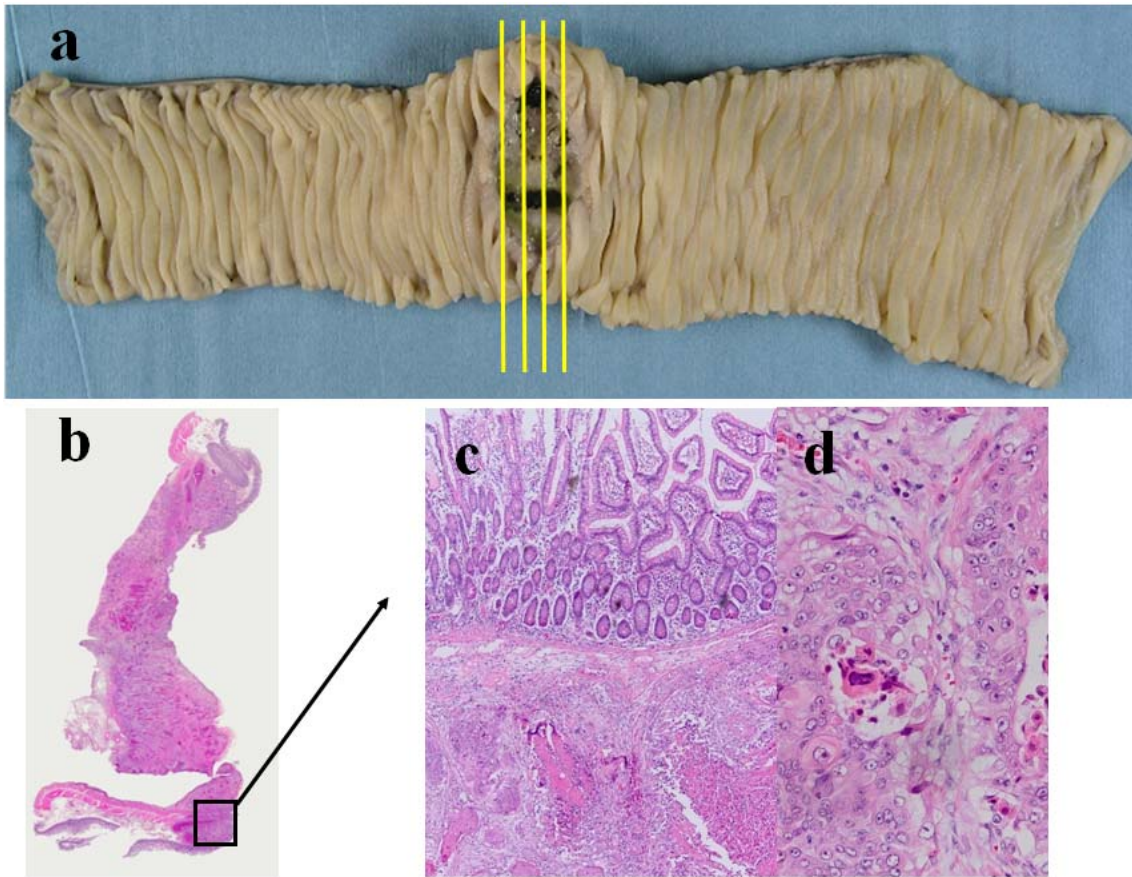


Figure.3: The macroscopic and histological findings of the perforation site.

The specimen of the intestine containing the ulceration in the center (a).

Squamous cell cancer was recognized in the small intestinal wall with hematoxylin at 1  
× magnification (b), 10 × (c), and were recognized in the blood vessels 40 × (d).