Colonic metastasis from lung cancer is rare and generally asymptomatic. Here, we report a case with lung adenocarcinoma that presented with acute abdominal pain due to intestinal obstruction caused by the metastatic colon tumor. The patient underwent emergency colonoscopy and the pathologic report was adenocarcinoma, which was the same as that for a bronchoscopic biopsy from a large lung mass. Immunohistochemistry was positive for thyroid transcription factor-1 and cytokeratin 7, and negative for cytokeratin 20 and caudal-related homeobox transcription factor 2 on both lung biopsy and colon surgical specimens. Accordingly, we used immunohistochemistry for thyroid transcription factor-1, cytokeratin 7, cytokeratin 20 and caudal-related homeobox transcription factor-2 to diagnose primary adenocarcinoma of the lung with colonic metastasis.

**Key Words:** colonic metastasis, immunohistochemistry, lung adenocarcinoma

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nausea and vomiting lasting for 24 hours. He stated that there had been blood in his feces for the previous month. He had a smoking history of 300 pack-years. He also complained of cough with mucoid sputum in the preceding year and intermittent hemoptysis starting 3 months earlier. The patient’s body temperature was 36.7°C, blood pressure was 132/64 mmHg, pulse was 98 beats/min, and respiration was 22 breaths/min. Chest auscultation revealed decreased breathing sounds in the left lower chest. Abdominal examination revealed mild tenderness in the left lower abdomen with decreased peristalsis by auscultation.

In the initial laboratory studies, the complete blood count, electrolytes, renal and liver function tests were normal. The serum carcinoembryonic antigen level was 652 ng/mL. On chest radiography, there was an ill-defined consolidation in the left lower lung, left costophrenic angle blunting, and numerous small nodular lesions in both lungs. A plain abdominal X-ray showed an ileus in the middle and left abdomen. A computed tomography scan of the chest showed a large mass at the left lower lobe with central necrosis, multiple nodular lesions in the bilateral lungs, and several small lesions with high density at the T-spine and ribs (Figure 1). A computed tomography scan of the abdomen showed an obvious intraluminal soft tissue mass at the descending colon and multiple small lesions with high density at the thoracic and lumbar spine, and the pelvic bone (Figure 2).

Because we strongly suspected the acute abdominal pain was caused by a colonic tumor with intestinal obstruction, a colonoscopy with biopsy was immediately performed and revealed a mass that was approximately 4.5 cm in size with intermittent oozing and easy contact bleeding, 25.0 cm from the anal verge. The microscopic finding of colonoscopic biopsy showed colonic mucosal tissue with inflammatory exudation, granulation tissue and nests of neoplastic cells in solid and focal glandular patterns. The pathological diagnosis was a poorly differentiated adenocarcinoma. The patient then underwent palliative transverse loop colostomy due to an obliterating cancer mass in the descending colon with intra-abdominal carcinomatosis and intestinal obstruction. The pathologic report of the surgical specimens showed metastatic adenocarcinoma compatible with a pulmonary origin based on immunohistochemical staining showing positivity for thyroid transcription factor-1 (TTF-1) and cytokeratin 7 (CK7) and negativity for cytokeratin 20 (CK20) and caudal-related homeobox transcription factor-2 (CDX-2) (Figure 3).

After the patient’s abdominal surgical condition was stabilized, he underwent bronchoscopy, which showed a protruding mass in the left common basal bronchus with lumen obstruction. The pathological report and immunohistochemical studies of the bronchoscopic biopsy specimens were consistent with adenocarcinoma of the lung (Figure 4). The patient was finally diagnosed with stage IV (T4N3M1) lung adenocarcinoma with colonic metastases. He refused systemic chemotherapy and passed away from disease progression and pneumonia with respiratory failure 6 months later.

Figure 1. Chest computed tomography revealed a large mass of about 11.0 × 7.0 × 9.5 cm in size at the left lower lobe with central necrosis.

Figure 2. Abdomen computed tomography revealed an intraluminal soft tissue mass of 4.6 × 2.3 × 4.5 cm in size in the descending colon.
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Figure 3. Pathologic images of the colon biopsy. (A) Hematoxylin-eosin-stained section. Strong immunohistochemical staining for (B) thyroid transcription factor-1 and (C) cytokeratin 7 (original magnification, 100×). Negative stain for (D) cytokeratin 20 and (E) caudal-related homeobox transcription factor-2 (original magnification, 200×).

Figure 4. Pathologic images of lung biopsy. (A) Hematoxylin-eosin-stained section. Strong staining for (B) thyroid transcription factor-1 and (C) cytokeratin 7 (original magnification = 100×).

DISCUSSION

Lung carcinoma is the leading cause of cancer death and about 50% of patients have distal metastasis at the time of diagnosis. The most common sites of extrapulmonary metastasis are the lymph nodes, liver, adrenal gland, bone and brain [1–5]. GI metastasis of primary lung carcinoma is considered to be rare, although the prevalence at autopsy is about 4.7–14.0% [6,7]. Metastasis to the small intestine is more common than metastasis to the stomach or colon [1,4,5]. Colonic metastasis usually occurs late in the disease and typically presents after the diagnosis of the primary lesion. Symptomatic colonic metastases have been reported, but they are rare. Occasionally, the lung primary and colonic lesion present synchronously.
In a study by Yang et al, the clinical prevalence of symptomatic GI metastasis of lung cancer was about 1.77% [1].

About one-third of colonic metastases from lung cancer are asymptomatic, and the diagnosis is reached at autopsy. The most common symptoms are abdominal pain, nausea, vomiting, anemia, and weight loss [7–9]. These findings generally present after the diagnosis of the primary disease, but can occur synchronously or before the diagnosis of the primary disease [10]. Our patient initially presented with acute abdominal pain. Emergency colonoscopy with biopsy and subsequent transverse loop colostomy were performed. The pathologic results of a colonic tumor and mesenteric lymph nodes were consistent with metastatic involvement from a primary adenocarcinoma of the lung. These were confirmed by immunocytochemical stainings, showing positive staining for TTF-1 and CK7, and negative staining for CK20 and CDX-2.

Immunohistochemistry is a very valuable and often useful tool for the differential diagnosis of lung carcinomas, and whether the carcinomas are primary or secondary to the lung. TTF-1 is very important in distinguishing between primary and metastatic lung adenocarcinoma, because most primary adenocarcinomas are TTF-1-positive, whereas metastatic adenocarcinomas to the lung are almost always TTF-1-negative [10,11]. Pulmonary adenocarcinomas are usually CK7 positive and CK20 negative, whereas metastatic adenocarcinoma of the colorectum is typically CK7 negative and CK20 positive [12]. CDX-2 is a highly specific and sensitive marker for adenocarcinoma of GI origin that could be used to differentiate this from primary lung or GI tumors [13]. With a panel of immunohistochemical markers, it is possible to differentiate or narrow down most lung neoplasms and classify them into meaningful therapeutic categories [10].

Lung cancer with intestinal metastasis has been reported to have a poor prognosis, with a mean survival time of only 4–8 weeks [8]. Treatment modalities depend on the nature of the presentation and the extent of the disease. Furthermore, which lesion should be treated first—the colonic metastasis or the primary lung cancer? With a complicated colonic lesion (obstruction, bleeding or perforation), surgery shortens the time of hospitalization and increases the quality of life. The procedure must be well tolerated and performed to provide sufficient palliation [14,15]. In our case, sufficient palliation was achieved with transverse loop colostomy. This patient survived for a further 6 months without systemic chemotherapy.

REFERENCES
以急性腹痛來表現的原發性肺腺癌合併大腸轉移

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肺癌合併大腸轉移是很罕見的，且通常臨床表現不會有明顯症狀。在此我們報告一個罕見案例，原發性肺腺癌合併大腸轉移病例，以類似腸阻塞之急性腹痛來表現，臨床上可能誤診斷為大腸癌合併多處轉移。病患接受緊急大腸鏡檢查及切片，及後續接受腹部手術及肺部支氣管鏡切片檢查的病理報告結果一致是肺腺癌。進一步在免疫組織染色研究上證實肺腺癌合併大腸轉移，其二者均表現 TTF-1 及 CK7 呈陽性，而 CK20 及 CDX-2 呈陰性。

關鍵詞：大腸轉移，免疫組織染色，肺腺癌

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