

## Usefulness of a Colonic Stent for Colonic Obstruction Caused by Lung Cancer Metastasis

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The gastrointestinal tract is not a common site for metastasis from lung cancer, and colonic metastases are especially rare. Although surgical intervention can improve colonic obstruction, perioperative mortality is high in patients with advanced malignancy, and these patients experience a significant deterioration in quality of life postoperatively. This report describes an uncommon case of colonic metastasis from non-small cell lung cancer (NSCLC), in which colonic obstruction was improved with a self-expanding metallic stent. A 62-year-old man was admitted to our hospital for progressively worsening abdominal pain. He had been treated with immunotherapy and chemotherapy after being diagnosed with NSCLC (T4N2M1) 1.5 years earlier. Enhanced computed tomography showed intestinal obstruction and a mass in the colon at the hepatic flexure. Histopathological analysis of a biopsy specimen confirmed NSCLC metastasis. Considering his general condition, endoscopic stenting was chosen as an urgent decompression procedure. He was discharged 45 days after stenting and was able to resume immunotherapy. Emergency stenting could be offered at experienced centers when operative intervention is not part of the treatment plan, as it is safe and improves the efficiency of care along with the quality of life. (*J Nippon Med Sch* 2021; 88: 556–560)

**Key words:** lung cancer, colonic metastasis, self-expanding metallic stent

### Introduction

Approximately 30%-40% of lung cancers are metastatic at the time of diagnosis<sup>1,2</sup>, but metastasis to the gastrointestinal tract, especially the colon, is uncommon<sup>3</sup>. If intestinal obstruction is exacerbated and the general condition is poor because of advanced or metastatic cancer, a self-expanding metallic stent (SEMS) can help to maintain the quality of life without complications. Here, we report a rare case of colonic metastasis from non-small cell lung cancer (NSCLC), in which colonic obstruction was improved by SEMS placement.

### Case Report

A 62-year-old man was admitted to our hospital for progressively worsening abdominal pain in January 2020. He had received immunotherapy (pembrolizumab: 200 mg/m<sup>2</sup>), chemotherapy (carboplatin: area under the curve = 6, pemetrexed: 500 mg/m<sup>2</sup>, and bevacizumab: 15

mg/kg), and radiation therapy for bone metastases after being diagnosed with NSCLC (T4N2M1, right adrenal gland, bone) in September 2018 (**Fig. 1**). Laboratory tests revealed slight anemia (hematocrit: 39%, hemoglobin: 12.6 g/dL), a leukocyte count of  $60 \times 10^3/\mu\text{L}$ , a platelet count of  $23.7 \times 10^3/\mu\text{L}$ , and elevated C-reactive protein (4.72 mg/dL) and alkaline phosphatase (887 IU/L) levels. Enhanced computed tomography (CT) showed a mass in the colon at the hepatic flexure and intestinal dilatation proximal to the lesion (**Fig. 2**). Colonoscopy revealed a bulky tumor at the hepatic flexure.

Surgery was anticipated to be difficult because the tumor was located at the hepatic flexure and may have invaded organs such as the gallbladder, duodenum, and common bile duct. Moreover, the patient was considered unsuitable for surgery because his general condition was poor and his cancer was advanced with multiple metastases. Accordingly, we decided to place a colonic SEMS.

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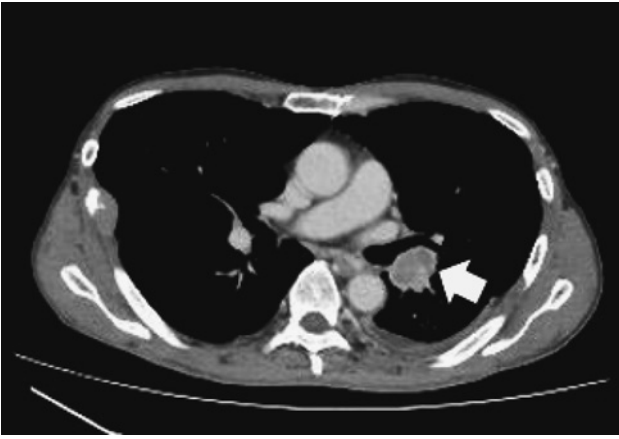


Fig. 1 Computed tomography shows a mass in the left lower lung field (arrow).

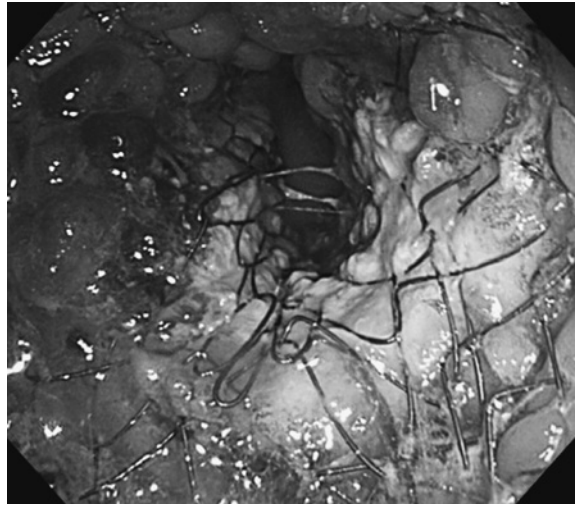


Fig. 3 Colonoscopy reveals a bulky tumor at the hepatic flexure. A self-expanding metallic stent was placed through the stenosis.

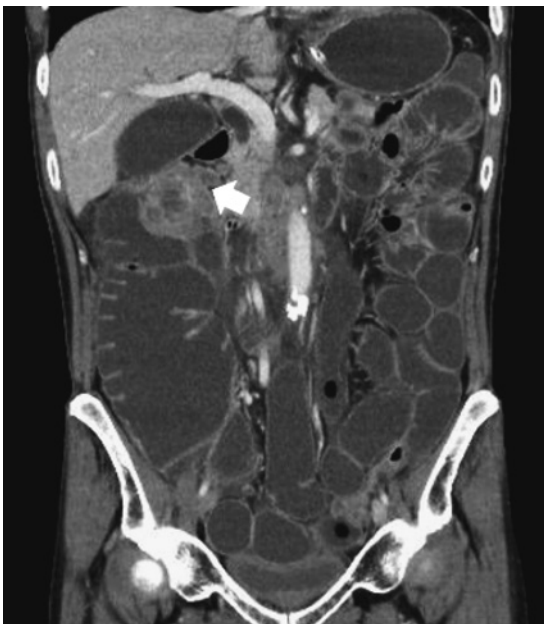


Fig. 2 Abdominal computed tomography demonstrates a mass in the colon at the hepatic flexure and intestinal dilatation proximal to the lesion (arrow).

After acquisition of biopsy specimens, the stenosis was opened using a 22-mm/9-cm through-the-scope SEMS (HANAROSTENT Naturfit™, Boston Scientific) (Fig. 3). His occlusive symptoms were relieved immediately after SEMS placement. He passed flatus the following day and commenced an oral diet 3 days after the treatment. Although his post-treatment course was uneventful, his performance status remained significantly poor; thus, rehabilitation was prolonged. He was discharged 45 days after SEMS placement.

Hematoxylin and eosin staining of the primary lung tumor revealed large, polymorphic cells as well as densely infiltrating and proliferating, atypical cells with

distinct nucleoli. Immunostaining revealed that the tumor was positive for AE1/3, vimentin, and cytokeratin (CK) 7 and negative for CK5/6, thyroid transcription factor-1 (TTF-1), Napsin-A, p40, CD56, CK20, and caudal type homeobox 2 (CDX-2) (Fig. 4). These findings indicated that the primary lung cancer was NSCLC. Meanwhile, histopathological examination of the colonic biopsies revealed large cells with polymorphic nuclei, typical of primary lung cancers. Immunostaining showed results identical to those for the lung cancer (Fig. 5). On the basis of these findings, we concluded that the colonic obstruction was caused by metastasis from the lung cancer.

Immunotherapy (nivolumab: 240 mg/m<sup>2</sup>) was initiated after discharge. Six months after SEMS placement, at the time of writing this report, the patient was alive without recurrence of bowel obstruction and continued to receive immunotherapy.

### Discussion

Distant metastases from lung cancer are frequently found in the bone, lung, brain, liver, and adrenal glands. However, metastasis to the colon is rare, accounting for only 0.1% of all colorectal tumors<sup>3</sup>. Taira et al. reported that among 2,066 lung cancer patients, only seven (0.33%) and two (0.09%) had gastrointestinal and colonic metastases, respectively<sup>4</sup>. Tamura et al. reported that only one (0.1%) of 729 NSCLC patients with distant metastases had colonic metastases<sup>5</sup>.

The exact prevalence of colonic metastasis from lung cancer is difficult to determine. According to several autopsy studies, asymptomatic colonic metastasis occurs

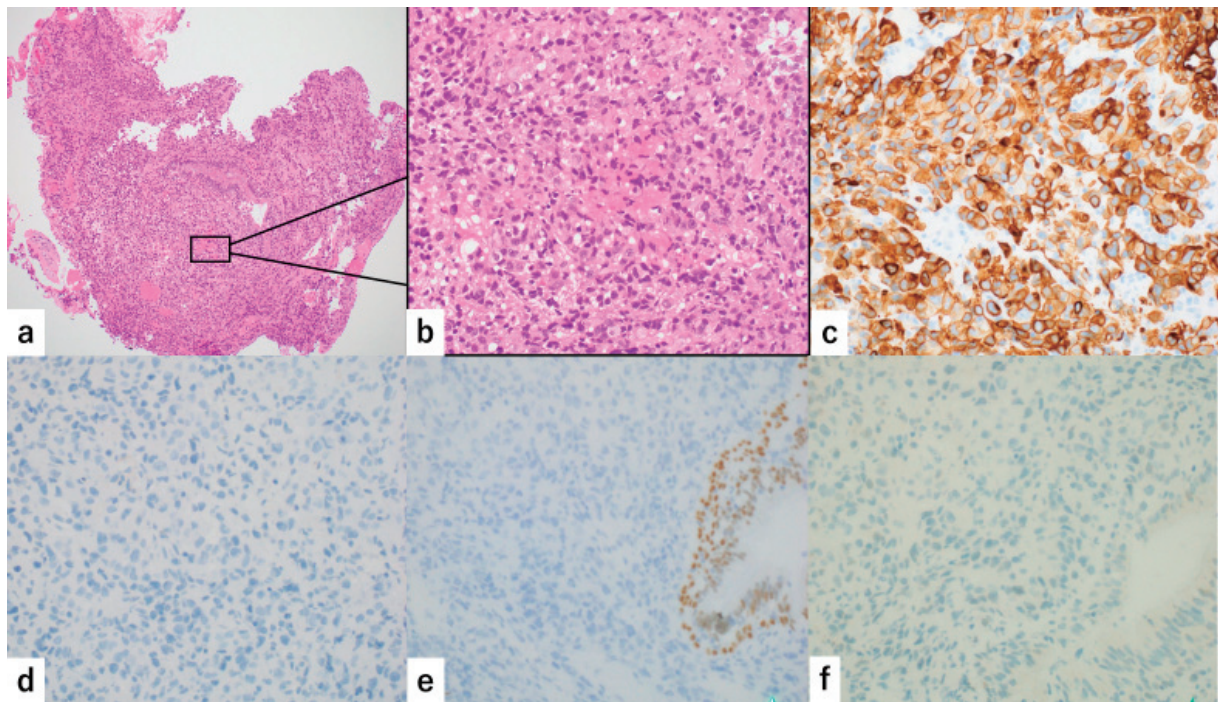


Fig. 4 Histopathological findings for the primary lung tumor. Hematoxylin and eosin staining reveal large, polymorphic cells as well as densely infiltrating, proliferating atypical cells with distinct nucleoli (a:  $\times 10$ , b:  $\times 40$ ). Immunostaining shows positivity for CK7 (c) and negativity for CK20 (d), TTF-1 (e), and CDX-2 (f). CK; cytokeratin, TTF-1; thyroid transcription factor-1, caudal type homeobox 2; CDX-2

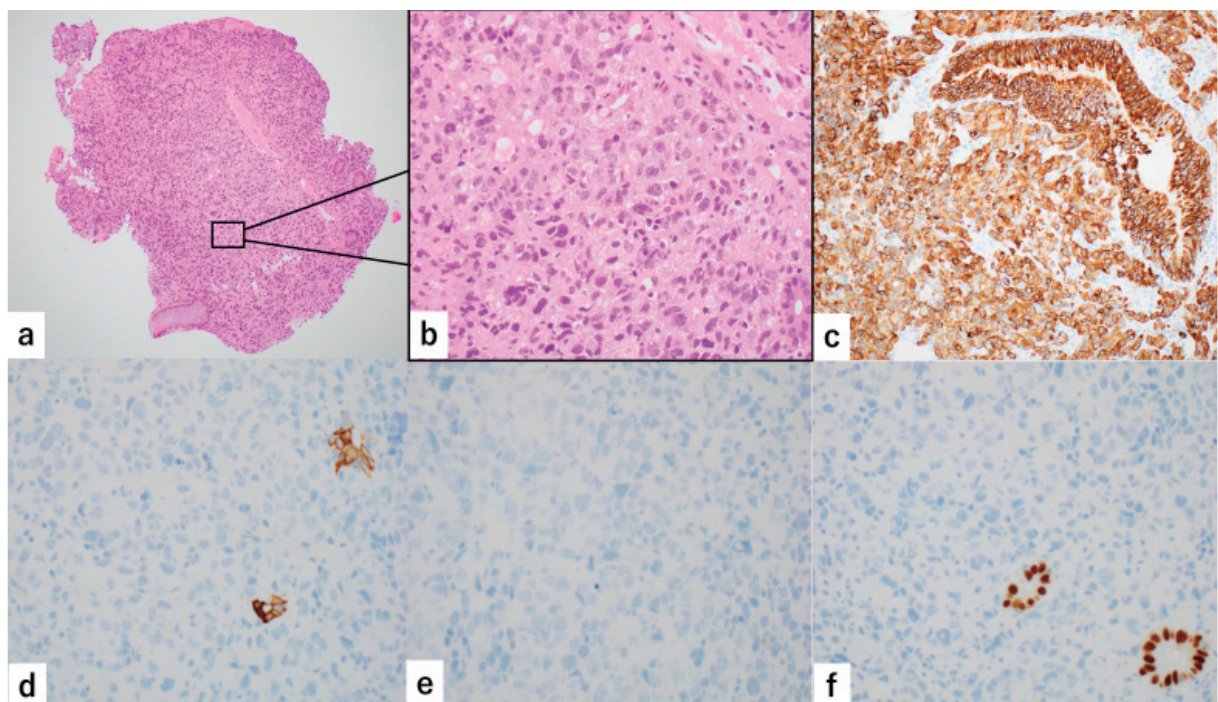


Fig. 5 Histopathological findings for the colonic biopsies. Hematoxylin and eosin staining reveal large cells with polymorphic nuclei (a:  $\times 10$ , b:  $\times 40$ ). Immunostaining shows positivity for CK7 (c) and negativity for CK20 (d), TTF-1 (e), and CDX-2 (f).

in approximately 12% of lung cancer patients<sup>6-8</sup>. This high percentage suggests that colonic metastases are often

overlooked by clinicians treating lung cancers because of their rarity and lack of characteristic findings on ultra-

sonography and abdominal CT. If symptoms such as abdominal pain occur, they are thought to be caused by conditions such as enteritis, gastric ulcer, and cholecystitis; therefore, physicians generally do not perform careful examination. In addition, the patient might have died from other organ metastases or complications before the appearance of colonic metastasis. Compared with colonic metastasis, small intestinal metastasis from lung cancer is more commonly reported<sup>9</sup>. This is because the small intestine has a thinner wall and a smaller lumen than does the large intestine, resulting in a higher frequency of serious complications such as perforation and intestinal obstruction<sup>10,11</sup>. Therefore, detection of metastases in the small intestine is more likely than detection of metastases in the large intestine.

In this case, the primary lung tumor was diagnosed as NSCLC. Because immunostaining showed negativity for both CD5/6 and p40, it was less likely to be a squamous cell carcinoma. Furthermore, adenocarcinoma was unlikely because immunostaining showed negativity for both TTF-1 and Napsin-A. The CD56 negativity also ruled out a neurological endocrine tumor. On the other hand, the tumor was positive for vimentin and AE 1/3, which indicated a high possibility of large cell carcinoma or sarcoma<sup>12</sup>. However, we could not make a definitive diagnosis because this case was diagnosed by bronchoscopy, and surgical resection is required for definitive diagnosis.

Malignant colorectal obstruction is an emergency condition that requires early decompression. Surgical intervention such as colostomy or SEMS is performed as palliative treatment. The 2019 Japanese Society for Cancer of the Colon and Rectum guidelines mention that stent treatment should be carefully considered while the patient is being treated or has been treated with antiangiogenic therapy such as bevacizumab<sup>13</sup>. Similarly, the 2020 European Society of Gastrointestinal Endoscopy guidelines for SEMS do not suggest colonic stenting while patients are receiving antiangiogenic therapy such as bevacizumab<sup>14</sup>. In this case, the patient had been treated with bevacizumab. Thus, colonic stenting should have been carefully considered because of the high risk of perforation and penetration. However, as mentioned earlier, his general condition was poor and he was unsuitable for surgery. In addition, the tumor location at the hepatic flexure could complicate surgery. Therefore, colonic stenting was performed after completing the necessary informed consent procedure.

Currently, three types of SEMS can be used; these in-

clude Niti-S™ (Century Medical), WallFlex™ (Boston Scientific), and HANAROSTENT Naturfit™ (Boston Scientific). The HANAROSTENT Naturfit™ is a large intestinal stent sold by Boston Scientific since July 2017. It has available outer diameters of 20 mm and 22 mm and lengths of 6, 9, and 12 cm<sup>15</sup>. At present, there are only two reports regarding the use of the HANAROSTENT Naturfit™ for colonic obstruction caused by colorectal cancer. Hashimoto et al. reported the use of HANAROSTENT Naturfit™ in two patients. Technical and clinical success was achieved in both patients, and there was no recurrence of colorectal obstruction for 4 months<sup>16</sup>. Ishibashi et al. also reported the use of the HANAROSTENT Naturfit™ in six patients, only one of whom developed colonic perforation<sup>17</sup>. To our knowledge, the case of colonic metastasis from lung cancer has been performed surgery or chemotherapy, or palliative treatment<sup>18-20</sup>. Thus, our case might be the first report of using SEMS for colonic obstruction caused by lung cancer metastasis.

Several meta-analyses comparing SEMS and surgical intervention have shown that SEMS is superior to surgery with respect to short-term complications and shorter hospital stays. However, long-term complications such as perforation, stent migration, and stent obstruction are frequently reported in patients with SEMS<sup>21-23</sup>. This is because a longer survival time is achieved, and patients can continue treatments such as chemotherapy or immunotherapy. According to Liang et al., the incidence of perforation was 3.7% in the short term and 7.6% in the long term. They also reported that the incidence of stent migration was 8.9%<sup>24</sup>. In addition, Watt et al. reported that the median rate of stent obstruction was 12%, and it occurred from 48 hours to 480 days after placement<sup>22</sup>. Ono et al. analyzed 50 cases of colorectal metastases from lung cancer and compared the median survival time between the surgery group and non-surgery groups. Although a longer survival time was achieved in the surgery group (90.5 vs 45.0 days), the difference was not statistically significant ( $p=0.054$ )<sup>25</sup>. Although the utility of abdominal surgery in such cases remains controversial, the findings from this case suggest that SEMS placement is more useful than surgery for palliative treatment.

Because colonic metastasis from lung cancer is the terminal stage of the cancer, radical resection is rarely performed. Lee et al. reported that the average time from gastrointestinal metastasis to death was 2.8 months<sup>23</sup>. Moreover, Ishibashi et al. reported that most patients who underwent surgical intervention died within 1 year after the operation<sup>26</sup>. Thus, we suggest that the indica-

tions for surgical intervention should be carefully considered, and that SEMS is more useful than surgery.

### Conclusion

This case report describes a rare case of colonic obstruction caused by metastasis from primary lung cancer. Instead of surgery, a colonic stent was placed, and the post-treatment course was uneventful. The patient retained a good quality of life and could receive immunotherapy. Therefore, we suggest that colonic stents are more useful than surgery in such cases.

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**Conflict of Interest:** The authors declare no conflicts of interest.

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