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Case report

Unusual Initial Presentation of Primary Lung Adenocarcinoma as a Metastatic Sigmoid Colon Lesion: A Rare Case Report

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Abstract
Metastatic spread of primary lung adenocarcinoma to the colon is rare, with initial presentation as a colonic lesion being exceptionally uncommon. Differentiating primary colorectal adenocarcinoma from metastatic pulmonary adenocarcinoma poses a diagnostic challenge due to overlapping clinical and histopathological features. We describe the case of a 60-year-old man who presented with nonspecific abdominal symptoms and was found to have a sigmoid colon mass on colonoscopic evaluation. Histopathological analysis revealed adenocarcinoma, and immunohistochemical profiling supported a pulmonary origin. Subsequent thoracic imaging identified a spiculated lung mass, which on biopsy confirmed primary lung adenocarcinoma with metastatic involvement of the colon.
Keywords. Lung Neoplasms, Sigmoid Neoplasms, Immunochemistry.

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Introduction

Lung cancer is the second most commonly diagnosed malignancy worldwide, with an estimated 2.2 million new cases reported annually. Despite its incidence ranking, it remains the leading cause of cancer-related mortality globally[1]. Although lung cancer can metastasize to nearly any organ, gastrointestinal (GI) involvement is rare. When GI metastases do occur, they may involve any portion of the gastrointestinal tract, from the oral cavity to the anus[2]. Clinical manifestations are heterogeneous, ranging from an indolent, asymptomatic course to vague abdominal discomfort. In more advanced cases, patients may present with acute surgical emergencies, including massive gastrointestinal hemorrhage, bowel obstruction, or perforation, necessitating prompt surgical intervention[3].

Case report

A 60-year-old male with no significant past medical history presented to the outpatient medical clinic with a three-month history of intermittent lower abdominal pain. The pain was non–meal-related, rated 4–5/10 in intensity, and associated with constipation, defined as one bowel movement every three days. He also reported unintentional weight loss of 9 kg over the same period. Additionally, he endorsed a two-month history of chronic productive cough with yellowish sputum and exertional dyspnea corresponding to modified Medical Research Council (mMRC) grade 2. The patient had a significant smoking history of 60 pack-years, denied alcohol use or pet exposure, and reported no family history of malignancy.

On physical examination, he was afebrile and hemodynamically stable. Abdominal examination revealed mild tenderness localized to the left lower quadrant without guarding or peritoneal signs. Cardiopulmonary and cardiovascular examinations were unremarkable. Laboratory evaluation revealed a hemoglobin level of 10.6 g/dL (normal 12–16 g/dL), white blood cell count of 7.3 × 10^9/L (normal 4–11 × 10^9/L), platelet count of 491 × 10^9/L (normal 150–400 × 10^9/L), alanine aminotransferase (ALT) 49 U/L (normal < 40 U/L), aspartate aminotransferase (AST) 51 U/L (normal < 40 U/L) and preserved renal function. Inflammatory markers were unremarkable, and tumor markers, including carcinoembryonic antigen (CEA) and carbohydrate antigen 19-9 (CA 19-9), were within normal limits. Abdominal CT imaging revealed no remarkable findings. The patient was referred for a colonoscopy, which demonstrated an ulcerated, eccentric, hypervascular mass located 40 cm from the anal verge at the junction of the proximal sigmoid and distal descending colon (Figure 1).

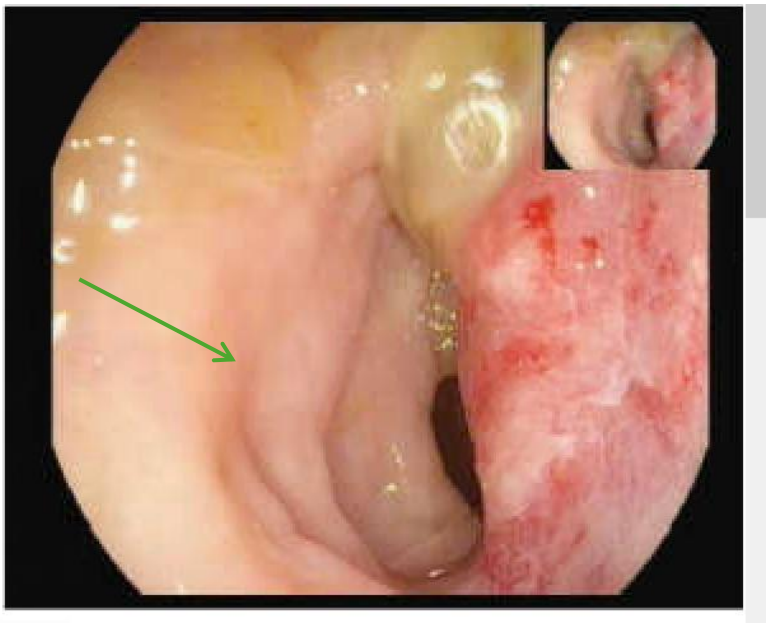

Figure 1: Colonoscopy showing an eccentric ulceroproliferative mass lesion at 40 cm from the anal verge. (Green arrow)

Histopathological evaluation of the biopsy specimen confirmed poorly differentiated adenocarcinoma, with no evidence of dysplasia in the overlying colonic epithelium. Immunohistochemical analysis reveals that the tumor cells are positive for cytokeratin 7 (CK7), exhibit weak positivity for thyroid transcription factor-1 (TTF-1), and are negative for Napsin A, a finding not consistent with primary colorectal adenocarcinoma, which raises the possibility of a metastatic carcinoma, with differential diagnoses including a primary tumor from the upper gastrointestinal tract, pancreatobiliary system, or lung (Figure 2).

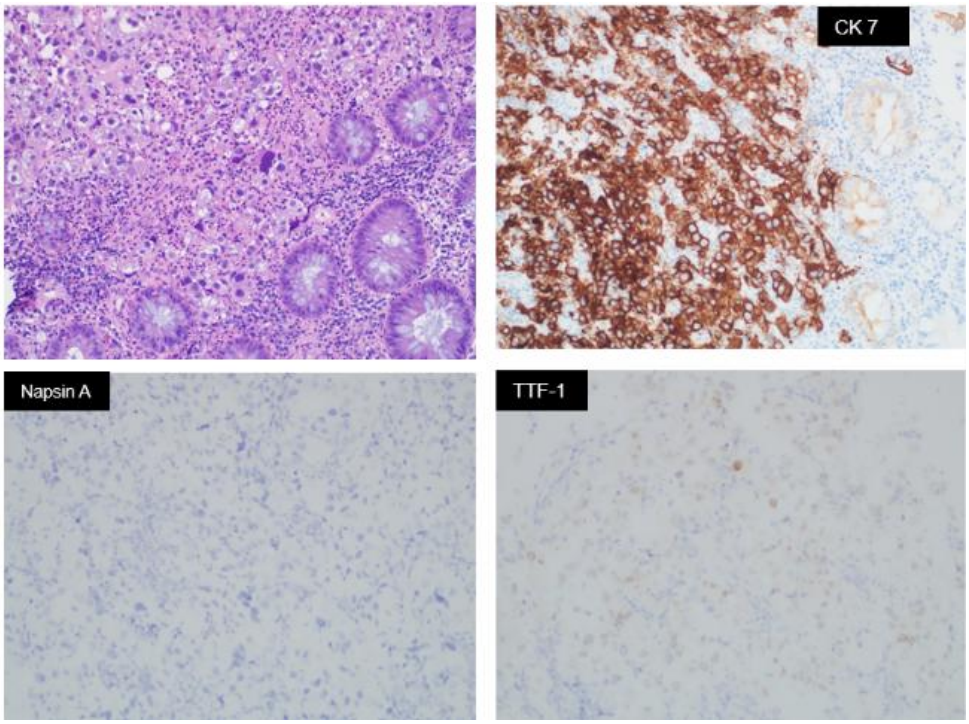

Figure 2: Microscopic examination of the sigmoid mass lesion demonstrates colonic mucosa infiltrated by a poorly differentiated carcinoma. Notably, there is no evidence of dysplasia in the overlying colonic epithelium. Immunohistochemical analysis reveals that the tumor cells are positive for cytokeratin 7 (CK7), exhibit weak positivity for thyroid transcription factor-1 (TTF-1), and are negative for Napsin A. This immunoprofile is not consistent with primary colorectal adenocarcinoma. The findings raise the possibility of a metastatic carcinoma, with differential diagnoses including a primary tumor from the upper gastrointestinal tract, pancreatobiliary system, or lung. Correlation with clinical and radiological data is essential to establish the most likely primary site of origin

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Esophagogastroduodenoscopy (EGD) showed Los Angeles Grade C esophagitis, extensive superficial gastric ulcerations, and a duodenal ulcer involving the first part of the duodenum, all negative for malignancy.
A contrast-enhanced chest CT scan was performed to evaluate for a pulmonary origin of malignancy. Imaging demonstrated a right perihilar mass measuring 2.6 × 2.3 × 3.7 cm, accompanied by a subcarinal lymph node, bilateral mediastinal lymphadenopathy, and multiple right-sided pulmonary nodules. The largest nodule, measuring 4.5 × 1.1 cm, was located in the apical segment of the right upper lobe (Figure 3). CT-guided biopsy of the pulmonary lesion confirmed pulmonary adenocarcinoma, acinar variant, with tumor cells positive for TTF-1, CK7, and Napsin A by immunohistochemistry (Figure 4). A whole-body positron emission tomography–computed tomography (PET-CT) scan revealed hypermetabolic activity in the lung mass, sigmoid colon lesion, adrenal glands, and skeletal system. The clinical, pathological, and radiological findings were consistent with a diagnosis of primary lung adenocarcinoma with synchronous metastasis to the colon. The patient was referred to a multidisciplinary lung cancer team for further management planning.

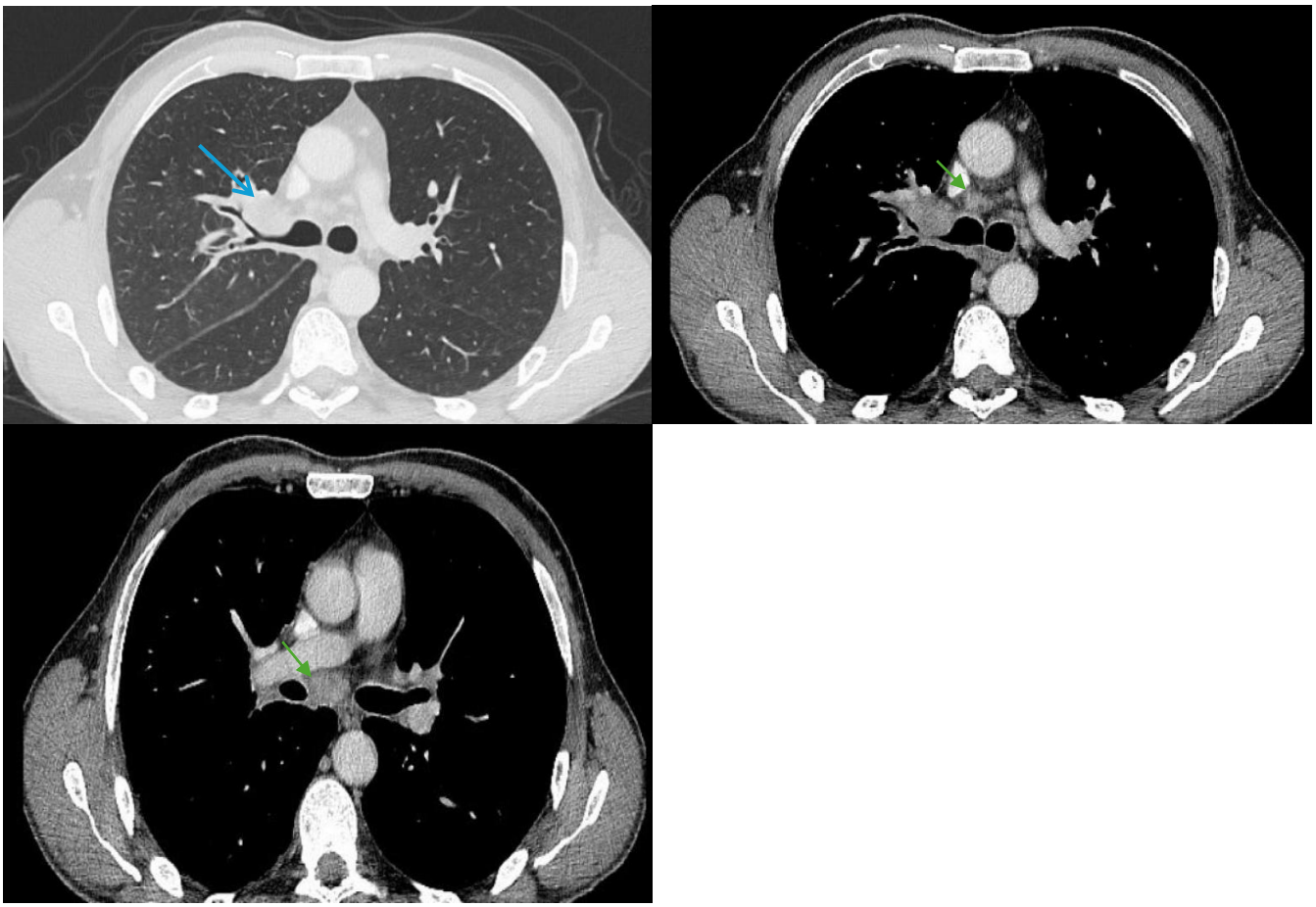

Figure 3: Chest CT scan (lung and mediastinal windows) showing 2.6 × 3.7 cm right perihilar lesion (blue arrow). Multiple mediastinal lymph nodes are noted in the precarinal and subcarinal spaces (green arrows).

Discussion

Histologically, lung cancer is classified into small cell lung cancer (SCLC) and non-small cell lung cancer (NSCLC), with NSCLC accounting for the majority of cases. Among NSCLC subtypes, adenocarcinoma is the most prevalent, especially in non-smokers and in tumors arising in the peripheral lung parenchyma[4]. Once distant metastases occur, the prognosis significantly worsens, and curative treatment options such as surgery are generally not feasible. The most common metastatic sites include bone (34.3%), lung (32.1%), brain (28.4%), adrenal glands (16.7%), liver (13.4%), and extrathoracic lymph nodes (9.5%)[5].
Metastatic spread to the GI tract is rare and often underdiagnosed. Clinical series estimate the incidence of GI metastases from lung cancer to range from 0.3% to 1.7%, whereas autopsy studies report rates as high as 4.6% to 14%[6]. This discrepancy highlights the often-silent clinical course of GI involvement. When GI metastasis does occur, the small intestine is the most frequently involved site, followed by the colon. A large retrospective study from 2018 looking at gastrointestinal metastasis of primary lung cancer demonstrated

that 59.6% of GI metastases involved the small bowel, 25.5% affected the colorectal region, followed by the stomach in 11.2%. The majority of metastases were to a single organ (69.4%) compared to multiple metastases (30.6%). Synchronous metastases (if the interval of diagnosis between lung cancer and GI metastasis was <1 month) and metachronous metastases (>1 month) were similarly probable (46.2% vs. 53.8%). The median time of metachronous patients from primary cancer diagnosis to GI metastasis was 6 months[7].

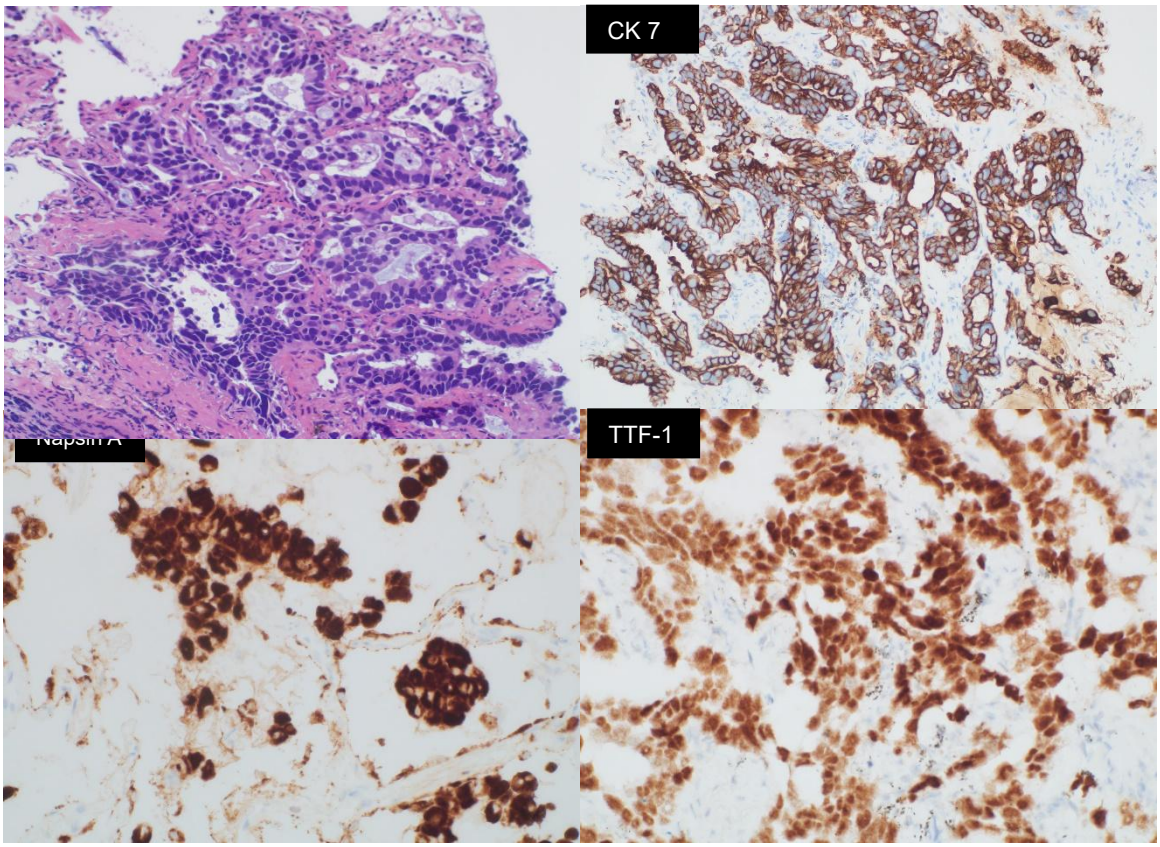

Figure 4: Lung biopsy revealed pulmonary adenocarcinoma, acinar variant, with tumor cells positive for TTF-1, CK7, and Napsin A by immunohistochemistry.

The majority of lung cancer metastases to the colon are accompanied by extra-GI metastasis in around 70% of the patients[8]. Among histological subtypes, squamous cell carcinoma (28.5%), adenocarcinoma (27.6%) and large cell carcinoma (20.9%) were the three most common histological types found in GI metastasis of lung cancer, though large cell carcinoma exhibits the highest tendency for GI metastasis, while adenocarcinoma is associated with the lowest[4]. Early GI metastases are often asymptomatic, with clinical manifestations emerging only when complications arise[9]. Among symptomatic patients, GI bleeding occurs in approximately 24.6%, bowel obstruction in 20.4%, and perforation in 20%. Histological subtype may influence complication risk, with large cell carcinoma associated with the highest rate of perforation, and adenocarcinoma with a comparatively lower incidence[7]. Gastrointestinal complications usually happen after the diagnosis of lung cancer, and sometimes they can occur even before the diagnosis of lung cancer is made[10], as in our case.

The mechanisms underlying GI metastases in lung cancer remain incompletely understood. However, hematogenous dissemination and lymphatic spread via regional lymph nodes are believed to play key roles. This could explain why the small intestine is frequently involved with lung cancer metastasis due to its abundant blood supply[7].

Diagnosis of gastrointestinal metastasis from lung cancer requires a multimodal approach including imaging, endoscopy, and histopathological confirmation. Abdominal computed tomography (CT), positron emission tomography-computed tomography (PET-CT), and endoscopy are key tools. Kim et al. reported that CT demonstrated findings suggestive of GI metastasis in 93% of cases, including focal bowel wall thickening, intraluminal masses, lymphadenopathy, intussusception, and signs of perforation[11]. PET-CT is especially useful for detecting metabolically active lesions and evaluating for concurrent metastases. Definitive diagnosis depends on histopathologic analysis. In this case, the colonic lesion exhibited poorly differentiated carcinoma infiltrating the mucosa without overlying epithelial dysplasia—a finding uncharacteristic of

primary colorectal adenocarcinoma, which typically arises through a sequence involving dysplastic epithelial changes.

Immunohistochemical profiling provided critical diagnostic insight. In our patient, the tumor cells in the sigmoid lesion were positive for CK7 and showed weak expression of TTF-1, while negative for Napsin A, CK20, CDX2, and SATB2. This immunophenotype is unusual for colorectal origin, where strong expression of CK20, CDX2, and SATB2 is generally expected. Instead, the CK7 positivity and focal TTF-1 expression raised suspicion for a pulmonary source, even in the absence of Napsin A staining[12,13]. It is important to note that metastatic tumors can exhibit altered or reduced marker expression compared to their primaries, particularly in the setting of high-grade or poorly differentiated disease.

Colonic metastasis from lung cancer carries a poor prognosis, with survival ranging from 5 weeks to 1 year, and most patients die within 6 months (14) . The most critical step in management is determining which lesion should be treated first, a decision that depends on the extent of colonic involvement and the clinical presentation. In complicated cases, surgical intervention can provide better outcomes by reducing hospital stay, enhancing quality of life, and offering palliation. In our patient, however, palliative chemotherapy was chosen due to disseminated disease.

Conclusion

Gastrointestinal metastasis from lung cancer is uncommon. This case underscores a rare initial presentation of lung cancer and emphasizes the critical role of immunohistochemistry in identifying the primary site of metastatic adenocarcinoma within the gastrointestinal tract.

Data Availability Statement

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Ethics Statement

The case report is approved by the Medical Research Center at Hamad Medical Corporation and the Hamad Institutional Review Board (IRB) under Number MRC-04-24-439.

Consent

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

Disclosure

No disclorure

Conflicts of Interest

The authors declare no conflicts of interest.

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