

Small Bowel Perforation Secondary to Metastatic Lung Cancer:

A Case Report and Review of the Literature

GEORGE H. SAKORAFAS, M.D.¹, GEORGE PAVLAKIS, M.D.², AND KYRIAKOS D. GRIGORIADIS, M.D.³

Abstract

Small bowel perforation is a rare complication of metastatic lung cancer. We were able to document 35 such cases in the literature in English. Aggressive investigation and early surgery is the only method for providing palliation to these patients. However, morbidity and mortality remain high and the prognosis is dire.

Key Words: Abdominal complications, acute abdomen, lung cancer, metastasis, small bowel perforation.

Introduction

LUNG CANCER is the most common cause of cancer-related death in both men and women in Western countries. Approximately 25% of all cancer deaths are attributable to lung cancer (1, 2). Moreover, about one-half of patients with lung cancer have metastatic disease at the time of initial diagnosis, most frequently of the bone, liver, and adrenal glands (2, 3). We report a case of small bowel perforation secondary to metastatic disease of lung cancer, a very rare complication in the natural history of this cancer.

Case Report

A 36-year-old woman presented with a two-month history of cough, fever, fatigue, and weight loss. During her evaluation, chest radiography showed a lesion at the hilum of the right lung, which had gradually enlarged. Bronchoscopy and biopsy established the diagnosis of a malignant (non-differentiated) tumor. Chest computerized tomography (CT) demonstrated marked mediastinal lymphadenopathy.

Diagnostic evaluation for staging of the neoplasm was negative for extrathoracic disease/dissemination. A right pneumonectomy was performed. Postoperative course was uneventful. Histology revealed a high-grade carcinosarcoma in the hilum of the right lung with lymph node metastases. The patient received six cycles of adjuvant chemotherapy with cisplatin-epirubicin-cyclophosphamide.

Five months later, the patient presented again with severe abdominal pain, diffuse abdominal guarding and rebound tenderness. Laboratory evaluation was without pathological findings, except a marked leukocytosis (WBC = 24,000/mm³). Abdominal X-ray demonstrated free intraperitoneal air; the patient was operated on with the diagnosis of a perforation of a hollow viscus. At surgery, two masses were found at the surface of two loops of the ileum within the fat of its mesentery. One of these ileal tumors was perforated. The abdominal exploration was without other pathological findings. Two segmental enterectomies with end-to-end anastomosis were performed. Histology showed a poorly differentiated metastatic neoplasm involving the ileum, consistent with the primary lung tumor (Figure). Postoperative course was uneventful and the patient discharged on postoperative day 7.

Four weeks later the patient presented again with weakness of the right arm. Neurological examination and CT scan showed the presence of brain metastases and enlarged mediastinal

From the Departments of ¹Surgery, ²Medical Oncology and ³Pathology, 251 Hellenic Air Force Hospital, Athens, Greece.

Address all correspondence to G.H. Sakorafas, M.D., Arkadias 19-21, GR-115 26 Athens, Greece; E-mail: georgesakorafas@yahoo.com

This manuscript was updated as of March 7, 2002.

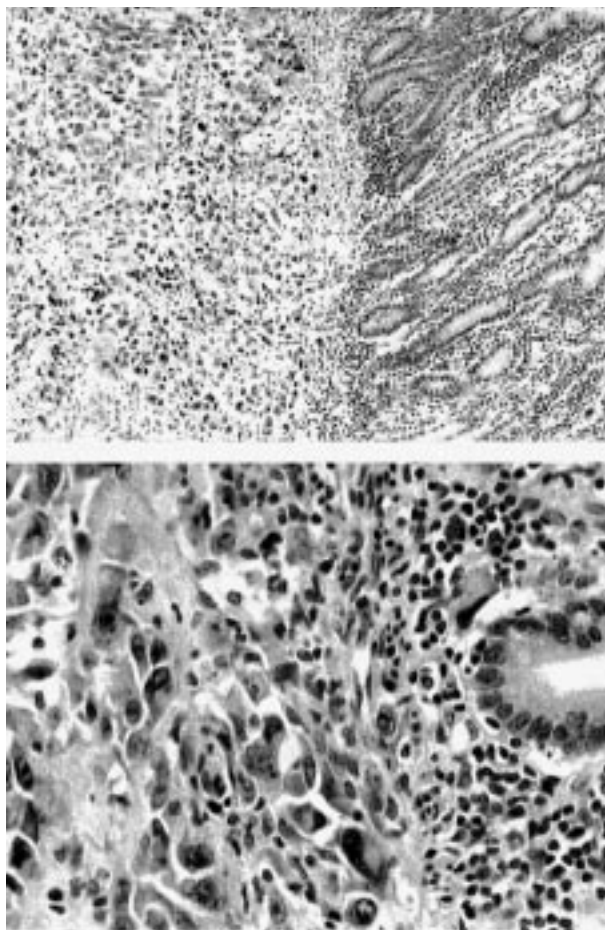


Fig. (Upper panel) Metastasis of carcinoma at the intestine's submucosal area under the normal glands (H & E \times 150). **(Lower panel)** Higher magnification of metastatic tumor cells (H & E \times 400).

lymph nodes. The patient died 4 weeks later, two months after abdominal surgery, from generalized disease.

Discussion

Despite the early and widespread dissemination of lung carcinoma to many body sites, clinically significant metastases isolated in the small bowel are rare and typically occur only in the advanced stages of the disease. The extent of metastatic disease in the natural history of lung cancer correlates with its histologic type (greatest for large and small cell carcinoma, least for squamous cell carcinoma). Isolated reports of small bowel perforation caused by metastatic lesions of various origins appeared in the literature during the first half of the 20th century; however, it was not until 1961 that the first case of small bowel perforation secondary to lung cancer was reported by Morgan, Sigel and Wolcott (4). Perforation of the small intestine as a result of these lesions is rare (5–17). Using a Medline search, we were able to document 35 such cases in the world literature in English. The Table lists some of these reported cases in which pulmonary histology was available.

Metastases to the small bowel may present as perforation, obstruction, malabsorption, and/or hemorrhage. Tumor cells metastasizing from lung cancer to the bowel wall by hematogenous routes form a tumor mass (5, 6), which replaces all or part of the bowel wall and results in various symptoms. If tumor necrosis should occur for any reason (e.g., after intense chemotherapy, as is seen with leukemia and lymphoma) (5, 18), perforation may ensue. If the mural tumor remains viable and grows into the bowel lumen, obstruction, instead of perforation, will occur. Furthermore, ulceration or

TABLE

Small Bowel Perforation Secondary to Metastatic Lung Cancer Review of the Literature in English

Reference Number	Year	Number of Patients	Histology
17	1967	1	Adenocarcinoma
16	1969	1	Large cell carcinoma
5	1981	1	Epidermoid carcinoma
13	1979	1	Adenocarcinoma
14	1977	1	Adenocarcinoma
15	1976	1	Squamous cell carcinoma
12	1982	3	Squamous cell carcinoma
12	1982	2	Undifferentiated carcinoma
12	1982	1	Adenosquamous carcinoma
11	1985	1	Squamous cell carcinoma
9	1992	1	Squamous cell carcinoma
9	1992	2	Adenocarcinoma
10	2001	1	Adenocarcinoma

erosion of the tumor may lead to gastrointestinal hemorrhage, and extensive replacement of the bowel wall by the tumor may lead to malabsorptive states. Of note, McNeil et al. (6) reported that small bowel perforation is a more frequent result of metastasis from lung cancer than from other primaries, possibly because these metastases have a tendency to undergo necrosis before attaining enough bulk to cause obstruction. Therefore, it has been recommended that when a metastatic tumor is found unexpectedly at laparotomy for perforated viscus in a heavy smoker after the fifth decade, lung cancer should be considered a potential primary (6–8, 19). Conversely, the etiology of perforated viscus in patients with lung cancer is likely to be metastasis to the small bowel, but the differential diagnosis should also include perforated peptic ulcer, perforated diverticulum, perforated colon cancer, and perforated appendix.

The presenting symptom is abdominal pain. However, the intensity of pain varies with the patient's general condition and age. A high degree of clinical suspicion coupled with rapid diagnosis and prompt intervention are of critical importance. Late intervention is associated with nearly uniform early fatality (9).

Management of these patients includes prompt initial resuscitation and stabilization of the patient, followed by exploratory laparotomy. If — during laparotomy — the only disease found is that of small intestinal perforation secondary to metastases, resection of the involved portion of the small bowel with primary entero-enterostomy is the procedure of choice (8, 9). However, this is a strictly palliative procedure, aimed at preventing immediate death, secondary to peritonitis and sepsis.

Obviously, metastasis to the small bowel is a dire prognostic sign, occurring typically in the final stages of widespread disease; surgery in this group of patients will have a high morbidity and mortality due to cancer, age, and associated medical problems. Despite the poor prognosis, early and aggressive intervention has occasionally yielded successful surgical palliation (8, 9).

References

1. Vaporciyan AA, Swisher SG. Thoracic malignancies. In: Feig BW, Berger DH, Fuhrman GM, editors. *The M.D. Anderson surgical oncology handbook*. 2nd ed. Philadelphia (PA): Lippincott Williams & Wilkins; 1999. pp. 109–129.
2. Greenlee RT, Murray T, Bolden S, Wingo PA. Cancer statistics, 2000. *CA Cancer J Clin* 2000 Jan–Feb; 50(1):7–33.
3. Silvenberg E, Lubera J. Cancer statistics. *CA Cancer J Clin* 1989; 39:3–22.
4. Morgan MW, Sigel B, Wolcott MW. Perforation of a metastatic carcinoma of the jejunum after cancer chemotherapy. *Surgery* 1961; 49:687–689.
5. Leidich RB, Rudolph LE. Small bowel perforation secondary to metastatic lung carcinoma. *Ann Surg* 1981; 193:67–69.
6. McNeill PM, Wagman LD, Neifeld JP. Small bowel metastases from primary carcinoma of the lung. *Cancer* 1987; 59:1486–1489.
7. Galsky M, Darling M, Hecht J, Salgia R. Unusual presentations of lung cancer. Case 1: small bowel obstruction due to metastatic lung cancer. *J Clin Oncol* 2000; 18:227–238.
8. Woods J, Koretz M. Emergency abdominal surgery for complications of metastatic lung carcinoma. *Arch Surg* 1990; 125:583–585.
9. Gitt SM, Flint P, Fredell H, Schmitz GL. Bowel perforation due to metastatic lung cancer. *J Surg Oncol* 1992; 51:287–291.
10. Ise N, Kotanagi H, Morii M, et al. Small bowel perforation caused by metastasis from an extra-abdominal malignancy: report of three cases. *Surg Today* 2001; 31:358–362.
11. Quayle AR, Jolt S, Clark RG. Jejunal perforation secondary to metastatic bronchogenic carcinoma. *Postgrad Med J* 1985; 61:163–165.
12. Antler AS, Ough Y, Pitchumoni CS, et al. Gastrointestinal metastases from malignant tumors of the lung. *Cancer* 1982; 49:170–172.
13. Ejeckam GC, Abele R, Thomas J, Heringer R. Abdominal crisis due to metastasizing lung carcinoma to the small bowel. *Can J Surg* 1979; 22:351–353.
14. Winchester DP, Merrill JR, Victor TA, Scanlon EF. Small bowel perforation secondary to metastatic carcinoma of the lung. *Cancer* 1977; 40:410–415.
15. Ramanathan T, Skene-Smith H, Singh D, Sivanesan S. Small intestinal perforation due to secondaries from bronchogenic carcinoma. *Br J Dis Chest* 1976; 70:121–124.
16. Wellmann KF, Chafiiian Y, Edelman E. Small bowel perforation from solitary metastasis of clinically undetected pulmonary giant cell carcinoma. *Am J Gastroenterol* 1969; 51:145–150.
17. Wootton DG, Morgan SC, Hughes RK. Perforation of a metastatic bronchogenic carcinoma to the jejunum. *Ann Thorac Surg* 1967; 3:57–59.
18. Meyers PA, Potter VP, Wollner N, Exelby P. Bowel perforation during initial treatment for childhood non-Hodgkin's lymphoma. *Cancer* 1985; 56:259–261.
19. Mosier D, Bloch R, Cunninham P, et al. Small bowel metastases from primary lung carcinoma: a rarity waiting to be found? *Am Surg* 1992; 58:677–682.