


CASE REPORT

Solitary splenic metastasis from lung adenocarcinoma: A case report

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Abstract

Solitary splenic metastasis is extremely rare, with only 27 reported cases in the literature. An 81-year-old woman was referred to our hospital for treatment of pulmonary and splenic lesions. Chest computed tomography showed a small lung nodule in the right upper lobe, abdominal computed tomography showed an 8 cm splenic mass with abnormal accumulation, and positron emission tomography revealed a maximum standardized uptake value of 7.9. She had elevated serum cancer antigen 19-9 (1847 U/mL) and carcinoembryonic antigen concentrations (17.9 ng/mL). She underwent laparoscopic splenectomy. Pathological examination revealed poorly differentiated adenocarcinoma. We performed partial lung resection and diagnosed the small lung lesion as lung adenocarcinoma. Both lesions were positive for thyroid transcription factor 1. Thus, primary lung adenocarcinoma and solitary splenic metastasis were diagnosed. The patient was still alive without recurrence four years postoperatively. Herein, we report a rare case of lung adenocarcinoma with solitary splenic metastasis and review the literature.

Introduction

Splenic metastasis from lung cancer is very rare. In a recent study, splenic metastasis from lung cancer was found in 12 out of 997 patients, and all 12 patients had metastases in other abdominal organs.¹ We herein report a case of solitary splenic metastasis from lung adenocarcinoma.

Case report

An 81-year-old woman was referred to our hospital for treatment of pulmonary and splenic lesions. Chest computed tomography (CT) showed a pulmonary nodule measuring 7 mm in diameter in the right upper lobe (Fig 1). Abdominal CT showed a splenic mass measuring 8 cm in diameter (Fig 2). Fluorodeoxyglucose positron emission tomography revealed abnormal accumulation with a maximum standardized uptake value of 7.9 (Fig 3). The pulmonary nodule showed no accumulation. She had elevated serum cancer antigen 19-9 (1847 U/mL) and elevated serum carcinoembryonic antigen concentrations (17.9 ng/mL). She underwent laparoscopic splenectomy. Pathological

examination showed poorly differentiated adenocarcinoma. We subsequently performed partial resection of the right upper lobe for a possible diagnosis of primary lung cancer. Pathological examination revealed mixed-type lung adenocarcinoma. Immunohistochemical examination revealed positivity for thyroid transcription factor 1 in both the pulmonary and splenic lesions. We diagnosed the splenic lesion as solitary splenic metastasis from lung adenocarcinoma. The postoperative course was uneventful. The patient refused additional chemotherapy. At the time of this writing, the patient displayed no signs of metastatic recurrence (4 years postoperatively).

Discussion

Splenic metastasis from non-hematologic malignancies accounts for only 0.96% of metastatic carcinomas and 2.9–4.4% of autopsied carcinoma specimens.^{2,3} In most cases, the spleen is involved as a part of diffuse carcinomatosis with the presence of splenic metastases usually indicating widespread tumor dissemination.^{4,5} Very few splenic

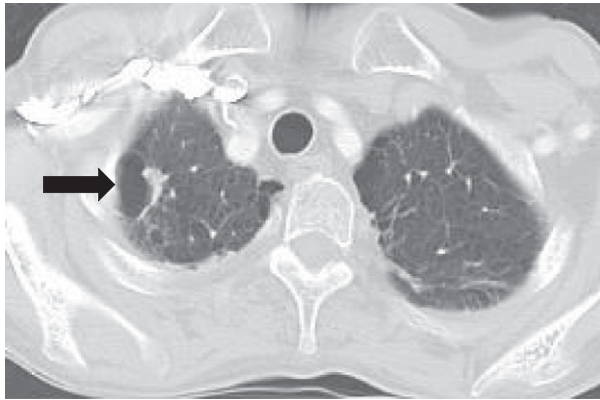


Figure 1 Chest computed tomography showing a right lung nodule (arrow).

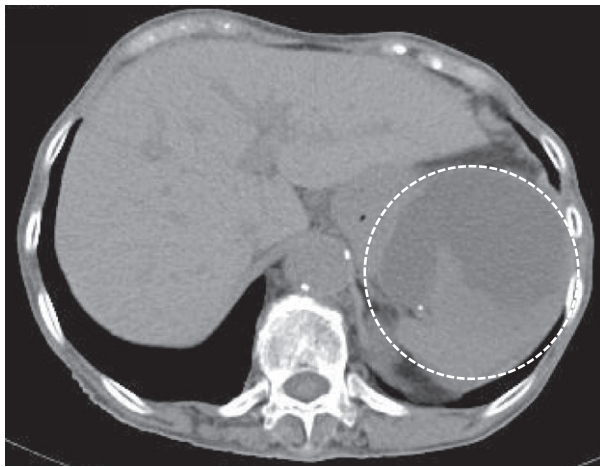


Figure 2 Abdominal computed tomography showing a solitary splenic mass (dotted line).

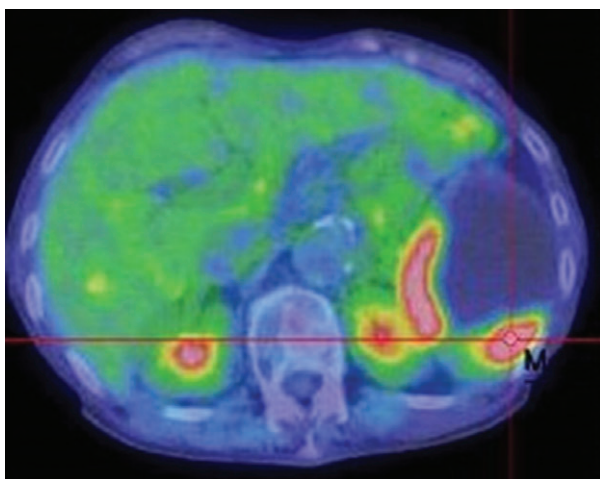


Figure 3 Fluorodeoxyglucose positron emission tomography showing abnormal uptake in the spleen (maximum standardized uptake value 7.9).

Table 1 Reported cases of solitary splenic metastasis from lung cancer

Characteristics	N = 27
Age (years)	
Median (range)	63 (49–82)
Gender	
Male/Female	20 / 7
Pathological subtype	
Adenocarcinoma	13 (48.1%)
Squamous cell carcinoma	7 (25.9%)
Large cell carcinoma	2 (7.4%)
Other	5 (18.5%)
Lung cancer pN factor	
pN0/pN1/pN2/pN3	10/4/5/1
Splenic metastasis size (cm)	
Median (range)	7 (1.5–13)
Rupture	
+ / –	3/24
Symptoms	
Asymptomatic	16 (59.3%)
Abdominal pain	8 (29.6%)
High fever	1 (3.7%)
No data	2 (7.4%)
Timing	
Synchronous/metachronous	11/16

metastases are observed as solitary splenic lesions either synchronous or metachronous to the primary tumor.

Only a few case reports and reviews have described solitary splenic metastasis from lung cancer. To date, 27 such cases (20 men, 7 women) have been reported in the published literature, as summarized in Table 1.^{6–28} The median follow-up period across all studies was seven months (range 1–96). The most frequent histological type of lung cancer with solitary splenic metastasis is adenocarcinoma ($n = 13$), followed by squamous cell ($n = 7$), and large cell carcinoma ($n = 2$). Twenty-four patients (85.7%) underwent splenectomy. Sixteen were diagnosed with splenic metastasis during the follow-up period after pulmonary resection. Eleven patients had synchronous lung cancer and splenic metastasis. We examined all 27 cases using Kaplan–Meier curves and log-rank test, which demonstrated a five-year survival rate of 41% and indicated that pathological stage NI–III cancer, tumor rupture, and synchronous disease were poor prognostic factors. In our case, the preoperative differential diagnoses of the solitary splenic tumor were angiosarcoma, malignant lymphoma, and a metastatic splenic tumor. We performed splenectomy to establish a definitive diagnosis and avoid splenic rupture. We also performed pulmonary partial resection because the patient was an elderly person with principally stage IV disease. Although she had synchronous disease, she achieved long-term survival.

In 24 reported cases of splenectomy, 12 (50%) patients underwent postoperative chemotherapy. No treatment

guidelines for solitary splenic metastasis from lung cancer are currently available. Lee *et al.* recommended splenectomy because most splenic metastases appeared within the parenchyma, indicating probable hematogenous spread.²⁹ According to the 2009 National Comprehensive Cancer Network guidelines for non-small cell lung cancer, when solitary metastasis of the adrenal gland and brain occurs without recurrence of metastasis at the primary site following surgical resection of the initial disease, resection of the brain or adrenal lesion is recommended.³⁰ Because the spleen is not a frequent organ in which lung cancer metastasis occurs, splenectomy is not discussed as a therapeutic strategy for splenic metastasis in the guidelines. If we follow the therapeutic principle of solitary brain or adrenal metastasis, splenectomy is also a good option for solitary splenic metastasis. Additionally, if clinical assessment before the initial treatment shows a resectable lung lesion and isolated splenic metastasis, surgical resection (splenectomy followed by resection of the lung lesion) could be recommended to avoid further metastatic disease, provide the potential for cure or extended survival, and avoid complications such as painful splenomegaly and splenic rupture. We consider pathological stage N0 cancer, non-ruptured tumors, and metachronous disease to be good surgical indications.

Systemic chemotherapy (adjuvant or neoadjuvant) is a reasonable option, although there is currently no supporting evidence of its efficacy. Of the 27 reported cases, 13 (48%) underwent chemotherapy; however, there was no significant difference in prognosis regardless of whether chemotherapy was performed.

Solitary splenic metastasis of lung cancer is extremely rare. We have herein reported such a case involving a patient who achieved long-term survival by lung resection and splenectomy.

Disclosure

No authors report any conflict of interest.

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