

## Long-term Survival Cases of Lung Cancer Presented As Solitary Bone Metastasis

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The prognosis of non-small cell lung carcinoma (NSCLC) with bone metastasis has been regarded as very poor. We report herein on two cases of NSCLC which presented as a solitary bone metastasis, were treated with surgical resection. Both these cases survived for over 5 years after their last operations. A 71-year-old man was hospitalized with right crural pain. A diagnosis of squamous cell carcinoma of the left lower lobe with right fibula metastasis was made. A marginal resection of the right fibula was performed. After that, a left lower lobe lobectomy and systemic chemotherapy were carried out. He had a local recurrence in the right mediastinal lymph nodes eleven months after the operation. He received intraluminal and external radiation therapy and obtained complete remission. He has survived for 5 years without any other recurrence or metastasis. A 52-year-old man was admitted to our hospital with left thigh pain. A diagnosis of adenocarcinoma of the right upper lobe with left thigh metastasis was made. A right upper lobe lobectomy and a resection of the left thigh tumor were performed. Three cycles of systemic chemotherapy were given after that. He has survived for 5 years since his last operation without any recurrence or metastasis. (*Ann Thorac Cardiovasc Surg* 2005; 11: 401–4)

**Key words:** non-small cell lung carcinoma, bone metastasis, long-term survival

### Introduction

Bone metastasis from non-small cell lung carcinoma (NSCLC) is not an infrequent finding in patients with this disease. The median survival rate of these patients is measured in months, and only a few survive beyond 1 year.<sup>1,2)</sup> Therapy is often given with palliative intent. We report two cases of NSCLC which presented as a solitary bone metastasis and was treated with surgical resection, and these cases survived for over 5 years after their last operations.

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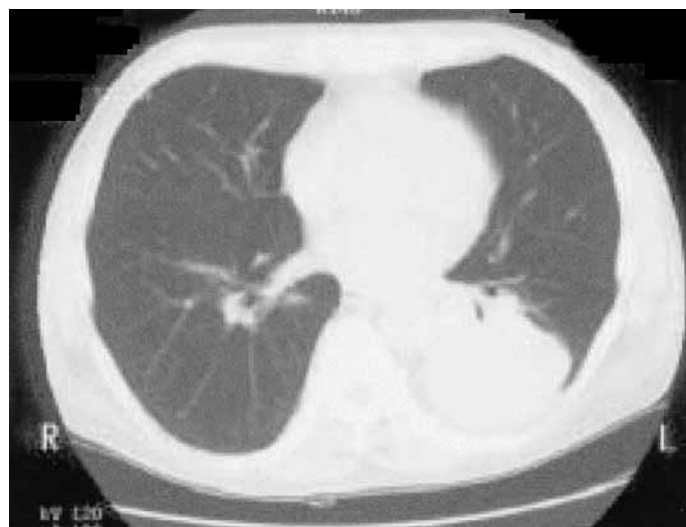
### Case Reports

#### Case 1

A 71-year-old man first experienced right crural pain in March 1998. His pain increased gradually and he was admitted to the Department of Orthopedic Surgery at our hospital in September 1998. magnetic resonance imaging (MRI) of the right crus demonstrated a cystic mass measuring 6 cm in size (Fig. 1). A computed tomography (CT) scan of the chest revealed a mass of the left lung measuring 7×4 cm in size (Fig. 2). A diagnosis of squamous cell carcinoma was made on the basis of the result obtained by transbronchial lung biopsy. A marginal resection of the right fibula was performed on September 9, 1998, with a provisional diagnosis of metastatic bone tumor. Microscopically, the tumor was diagnosed as well-differentiated squamous cell carcinoma from the lung. He was referred to our department and an operation was performed on October 12, 1998. At surgery, the tumor was located at the left lower lobe, adhered to the parietal



**Fig. 1.** MRI of the right crus demonstrates a cystic mass measuring 6 cm in size.



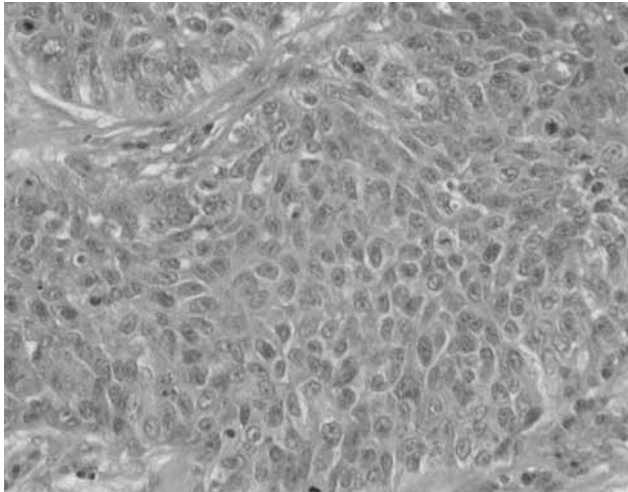
**Fig. 2.** A CT scan of the chest reveals a mass of the left lung measuring 7x4 cm in size.

pleura. A left lower lobe lobectomy was performed. The resected specimen showed a hard tumor measuring 8.0x7.7x6.5 cm. Histopathological study revealed well-differentiated squamous cell carcinoma (Fig. 3), and lymph node metastasis was found in the right mediastinum. The pathological stage was defined as stage IV (p-T2N3M1). Six cycles of systemic chemotherapy consisting of 50 mg/body etoposide for 14 days and 200 mg/body carboplatin were given afterward. He had a local recurrence in the right mediastinal lymph nodes in September 1999. He received intraluminal (5 Gy/day; total 15 Gy) and external radiation therapy (2 Gy/day; total 66 Gy) and obtained complete remission. The patient has survived for 5 years since his last operation without any

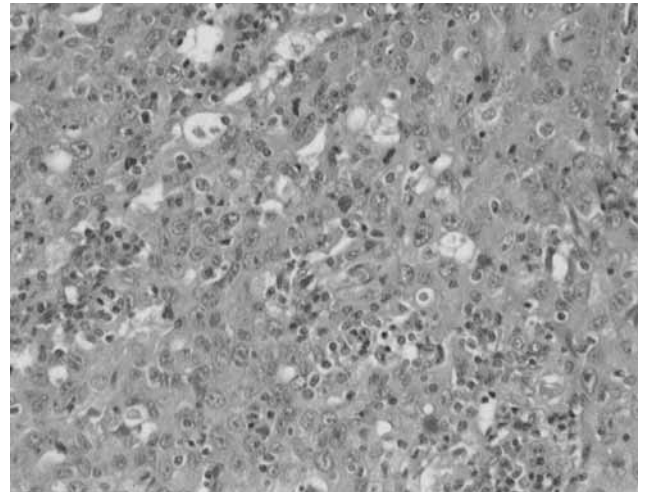
other recurrence or metastasis.

### Case 2

A 52-year-old man first experienced left thigh pain in October 1998. His thigh pain increased gradually and he was admitted to the Department of Orthopedic Surgery at our hospital in April 1999. MRI of the left thigh demonstrated a mass measuring 2x2 cm in size. A diagnosis of adenocarcinoma was made on the basis of the result obtained by percutaneous biopsy. Close examination was conducted to detect a primary lesion. A CT scan of the chest revealed a mass of the right lung surrounded by emphysematous bullae, and he was referred to our department. Under the diagnosis of stage IV (T1N0M1) right



**Fig. 3.** Histopathological study reveals well-differentiated squamous cell carcinoma. (HE stain,  $\times 200$ )



**Fig. 4.** Histopathological study reveals poorly differentiated adenocarcinoma. (HE stain,  $\times 200$ )

lung cancer, we performed a right upper lobe lobectomy on July 28, 1999. An elastic hard tumor measuring about 2 cm in size with multiple bullae was found in the right upper lobe. Microscopically, poorly differentiated adenocarcinoma in the giant bullous wall was diagnosed (Fig. 4). There was no lymph node metastasis. His postoperative course at our department was uneventful and he was referred to the Department of Orthopedic Surgery. A resection of the left thigh tumor was performed on August 30, 1999, and his postoperative course had no complications. Three cycles of systemic chemotherapy consisting of, 25 mg/m<sup>2</sup> adriamycin for 2 days and 100 mg/m<sup>2</sup> cisplatin including caffeine were given after that. The patient has survived for 5 years since his last operation without any recurrence or metastasis.

### Discussion

The poor prognosis of patients with locally advanced NSCLC has remained essentially unchanged in recent decades. The high death rate among patients with NSCLC is attributable to distant metastases as well as a high rate of failure to contain the local spread of tumor. At diagnosis, only 25% of all patients are considered candidates for surgery, mainly because of metastasis or local progression.<sup>3)</sup> The bone is known to be a common site of metastasis from lung cancer, as well as the brain, lung and adrenal glands. The incidence of bone metastases from NSCLC has been reported to be range from 15 to 40%.<sup>4)</sup> Most of these metastases occur predominantly in the

spine, rib and pelvis. Metastases to the distal extremities such as in our two cases are relatively rare and may be carried by the arterial system.

The median survival time of lung cancer with synchronous bone metastasis ranges from 5 to 6 months,<sup>2)</sup> and the two-year survival rate is only 3%. The incidence of pathological fracture, multiple bone metastases and the primary lesion have been the prognostic factors for survival in patients with metastatic bone tumors.<sup>5)</sup>

Concerning treatment, NSCLC with bone metastasis has not been indicated for surgery. Chemotherapy has only marginally improved survival. Radiation therapy has been used successfully to reduce local recurrence or as a palliative measure for local symptoms such as pain or bleeding. Schaake-Koning et al.<sup>6)</sup> reported that cisplatin in combination with radiation therapy in patients with non-metastatic but inoperative NSCLC improved rates of survival and control of local disease. It is doubtful that this therapy for patients with metastatic NSCLC would improve rates of survival and control of local disease. Recently, there have been reports of aggressive surgical therapy of solitary brain metastasis from NSCLC producing acceptable surgical results,<sup>7,8)</sup> and Raviv et al.<sup>9)</sup> reported that solitary adrenal metastasis from lung cancer should be treated by aggressive surgery. Luketich et al.<sup>10)</sup> stated that a more aggressive approach should be taken in treating patients with apparent solitary metastasis from NSCLC after complete control of their primary site and a complete metastatic survey.

The prognosis of NSCLC with bone metastasis has

been regarded as very poor, but we experienced two long-term survival cases after combined therapy including surgery for NSCLC with solitary bone metastasis. Our limited experience suggests that the best palliation for solitary bone metastasis from NSCLC can be achieved with aggressive surgical treatment. Therefore, we believe surgical therapy in both lesions may offer good therapeutic results in NSCLC presenting solitary bone metastasis when there is no other evidence of metastases.

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