

Case report

Prostate Cancer in a Patient with Multiple Pulmonary Metastases Alone and Respiratory Symptoms

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Abstract

An 87-year-old man was admitted complaining of cough after he had been treated with drugs at another hospital. Chest X-ray revealed multiple nodules, and chest computed tomography (CT) showed metastatic lung tumors. Abdominal CT revealed staining of the outer portion of the prostate by contrast medium, though this finding was considered nonspecific and nondiagnostic. A CT-guided biopsy of a lung tumor was performed, and the lung tumor was found to be positive for prostate-specific antigen (PSA). Prostate carcinoma was diagnosed by prostate biopsy, which yielded the same findings as the lung tumor. The serum PSA level was high. No metastases except for pulmonary lesions were observed on a bone scintigram and abdominal CT. Prostate carcinoma with pulmonary metastases alone was therefore diagnosed. The present case represents a rare case of pulmonary metastases without any other metastases.

Key words: prostate carcinoma, pulmonary metastases alone, PSA

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Introduction

In cases of prostate carcinoma, pulmonary metastases are the next most common metastases after bone metastases^{1–7)}, but clinically, the presence of pulmonary metastases without other metastases is rare^{1, 4–8)}. The present report describes a rare case of prostate carcinoma with pulmonary metastases alone in a man who was admitted complaining of cough.

Case Presentation

An 87-year-old man who had never smoked was admitted complaining of cough after he had been treated with drugs at another hospital.

The admission chest X-ray showed multiple nodules (Fig. 1), and chest computed tomography (CT) showed metastatic lung tumors (Fig. 2). Abdominal CT revealed contrast staining of the outer portion of the prostate, though this finding was considered nonspecific and nondiagnostic. Metastatic lesions including lymphadenopathy and bone metastases were not observed on abdominal CT. Gastrointestinal malignancy, especially in the colon, was initially suspected, but gastrofiberscopic and colonofiberscopic examinations were refused by the patient. CT-guided biopsy of a lung tumor was performed, which caused a small amount of hemoptysis. The lung tumor was found to be positive for prostate-specific antigen (PSA). A diagnosis of prostate carcinoma with Gleason pattern 4 was made by prostate biopsy (Fig. 3a), which yielded the same findings as the lung tumor (Fig. 3b). The serum PSA level was high (66.765 ng/mL; normal < 4 ng/mL). There were no bone metastases on the bone scintigram performed after CT-guided biopsy. Prostate carcinoma with pulmonary metastases and no other metastases was therefore diagnosed.

Hormonal therapy (bicalutamide and leuprolerin) was started after diagnosis. The chest X-ray and CT findings improved (Fig. 4), and the PSA level decreased to the normal range with hormonal therapy. However, 1 year after diagnosis, the tumors were refractory to therapy (Fig. 5). The PSA level was 0.259 ng/mL. The status of the patient was getting worse day by day, so hormonal therapy was stopped and changed to best supportive care. Many liver and pulmonary metastases occurred, and the patient died 15 months after diagnosis. His PSA level did not elevate before death and was 0.349 ng/mL at 12 days before death.

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Figure 1 Chest X-ray on admission shows multiple nodules.

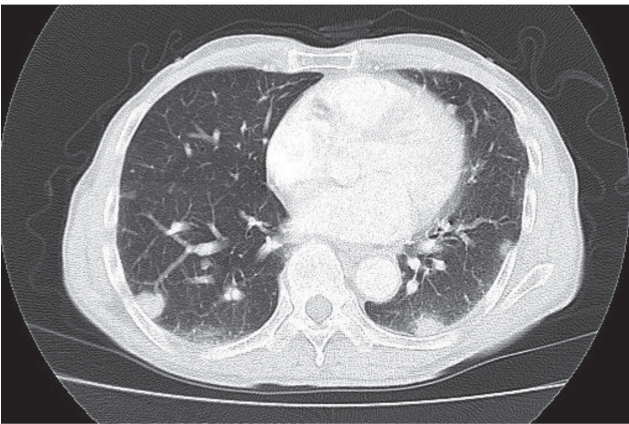
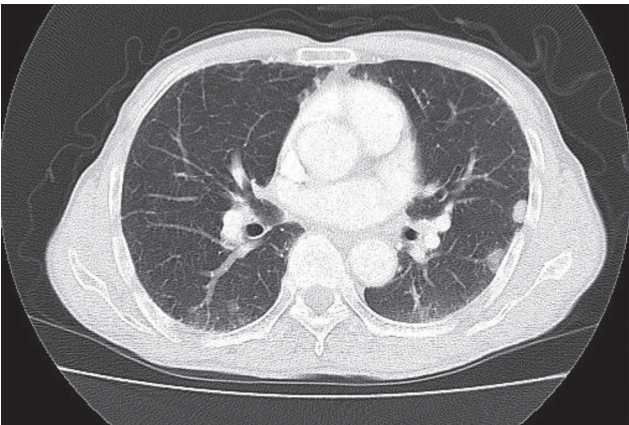
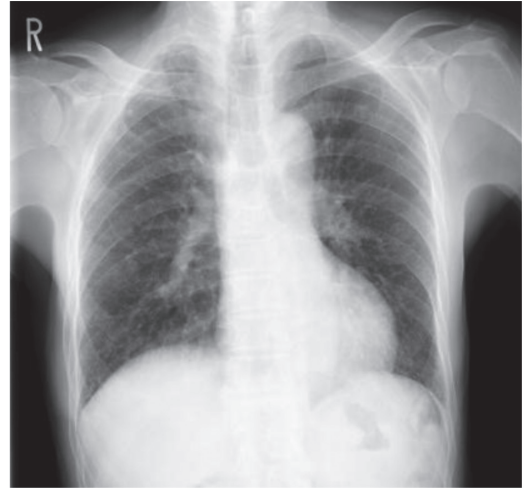


Figure 2 Chest CT shows metastatic lung tumors.

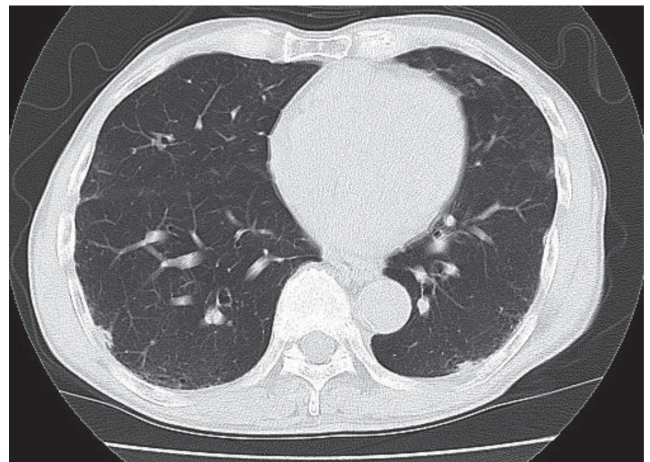
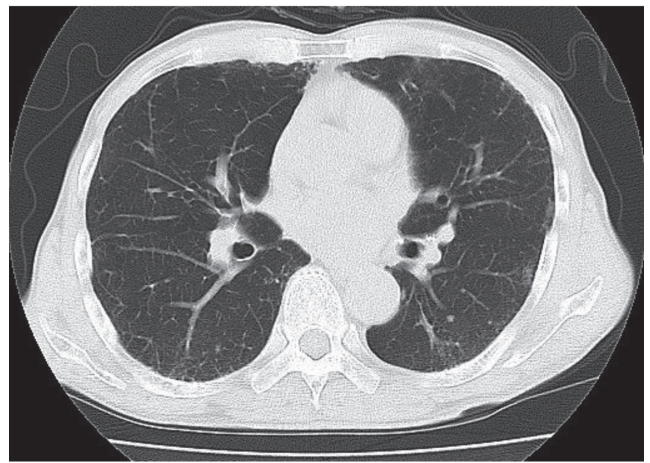


Figure 4 The chest X-ray and CT findings 6 months after hormonal therapy. The PSA level was 0.521 ng/mL.

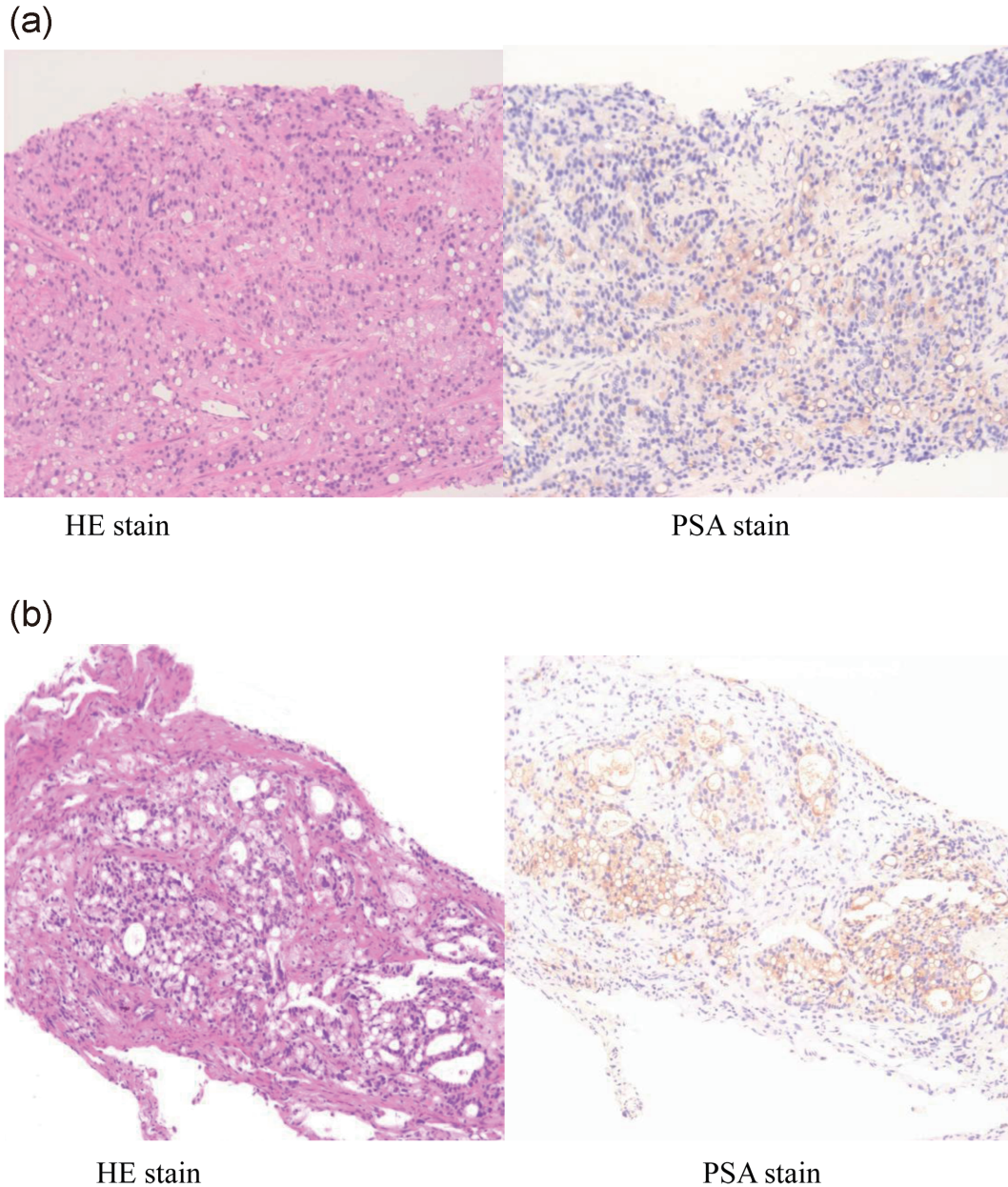


Figure 3 (a) Prostate biopsy specimen. (b) CT-guided biopsy specimen of a lung tumor.

Discussion

In prostatic carcinoma, the incidence of clinically apparent pulmonary metastasis has been reported to range from 3.6 to 27%⁴⁻⁸, and the incidence of the nodular type of pulmonary metastasis has been reported as 8%⁷; on the other hand, the incidence at autopsy has been reported to range from 23 to 74%^{1-4, 6}. Moreover, most patients with pulmonary metastases already have multiple lymph node and bone metastases and multiple organ involvement^{4, 5}. Thus, only a

few cases without any other metastatic sites have been reported^{1, 4-6, 8} because prostate carcinoma is a common malignancy that spreads initially by local invasion of adjacent pelvic structures and via the vertebral venous plexus to the bones^{3, 7}. Therefore, the present case could be considered rare.

Pathways of hematogenous metastasis in prostate cancer have been classified into 3 categories³: (A) backward venous spread to the spine, which is commonly seen; (B) cava-type metastasis into the lung and from there to other



Figure 5 One year after diagnosis, the tumors were refractory to therapy. The PSA level was 0.259 ng/mL.

organs; and (C) cava-type metastasis without lung involvement. This case would be considered type B.

CT-guided biopsy of a lung tumor was a useful and safe

method for diagnosis in the present case. The present case developed a small amount of hemoptysis that was not serious. Thus, CT-guided biopsy of a lung tumor should be actively performed in older patients.

The mainstay of treatment for prostate cancer with pulmonary metastases, as with other sites of metastasis, is hormonal therapy^{1, 4, 5}. Hormonal therapy was effective in the present case, which was confirmed by CT scan and the serum PSA level. Since the median survival of hormone-naive patients is 25 months^{1, 4}, the present case's survival was shorter, even though this was a hormone-naive case.

PSA was very effective for diagnosis in the present case but did not reflect the disease activity. PSA has often been used for diagnosis and monitoring of disease activity of prostate cancer, but this case suggested that PSA does not always reflect the disease activity. In rare instances, prostate cancer with an extremely poor prognosis that does not express PSA and expresses other tumor markers has been described^{9–12}, so it is possible that the present case was another case like this and that this was why hormonal therapy became ineffective. Disease activity should be evaluated by radiological and other tumor marker examinations besides serum PSA measurement.

Symptoms of pulmonary metastasis have various patterns: asymptomatic, dyspnea, cough, and hemoptysis^{4, 6, 7}. In the present case, the patient's symptom of cough led to the diagnosis; this highlights the importance of symptoms.

Thus, in men who present with pulmonary metastases, prostate carcinoma should be considered in the differential diagnosis along with colon cancer. In the present case, measurement of serum PSA levels was effective for diagnosis.

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