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Pleural metastasis of thyroid carcinoma diagnosed by thoracoscopy under local anesthesia

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Abstract

A 79-year-old male patient with no symptoms was referred to us with incidentally detected pleural effusion and nodules. He had previously been diagnosed with papillary thyroid carcinoma (PTC) and had undergone left subtotal thyroidectomy 12 years before his referral. Four years after the operation, he experienced a relapse limited to the cervical lymph node and was treated with neck dissection. He experienced no further recurrence until his referral. Thoracoscopy was performed under local anesthesia to confirm the diagnosis because thoracentesis was precluded by the small quantity of pleural effusion and the nodules. Many vivid red pleural masses were evident as was a small amount of bloody pleural effusion. The patient was diagnosed with pleural metastasis of PTC, which has a poor prognosis. Because of this poor prognosis, prompt diagnosis is essential. Thoracoscopy under local anesthesia can allow the prompt diagnosis of cases in which safe thoracentesis would be difficult.

Introduction

Papillary thyroid carcinoma (PTC) generally follows an indolent course, and distant spread is rare. Common sites of distant metastasis are lung parenchyma and bone. Pleural metastasis is less common, and most cases have been detected because of pleural effusion and diagnosed using pleural effusion cytology. Malignant pleural effusion is a poor prognostic factor among patients with PTC. Hence, timely diagnosis of pleural metastasis is clinically important. We report a case of pleural metastasis of PTC with a small quantity of pleural effusion diagnosed using thoracoscopic biopsy under local anesthesia. Thoracoscopy under local anesthesia can be useful in observing lesions and performing a biopsy in cases of very small pleural effusion as well as in cases of lesions that are difficult to examine using thoracentesis. Thus, thoracoscopy can enable prompt pathological diagnosis and timely initiation of therapeutic procedures.

Case Report

A 79-year-old man was referred to the department of pulmonary medicine with small pleural nodules, incidentally detected on abdominal computed tomography that was performed as a component of follow-up for hepatic hemangioma. The patient had been an office worker, with no history of exposure to asbestos but had a history of smoking (44 pack-years). He was diagnosed with PTC and carcinoma of the tongue 12 years before being referred to us and was treated with subtotal thyroidectomy, radical neck dissection, and partial glossectomy. Eight years after the first operation, he experienced a relapse of PTC, limited to the posterior cervical lymph node, and was treated with neck dissection. He did not experience any recurrence after the second resection and presented no symptoms up to referral.

Chest radiography (Fig. 1A) revealed left costophrenic angle blunting and a well-circumscribed, pleural-based mass in the upper left hemithorax. Contrast-enhanced computed tomography (Fig. 1B) showed well-enhanced noncalcified pleural nodules and a small quantity of pleural effusion, but no pulmonary involvement or mediastinal lymphadenopathy. Thoracic ultrasonography revealed a small quantity of pleural effusion, which precluded thoracentesis. To confirm the diagnosis, thoracoscopy was performed under local anesthesia in the endoscopy unit.

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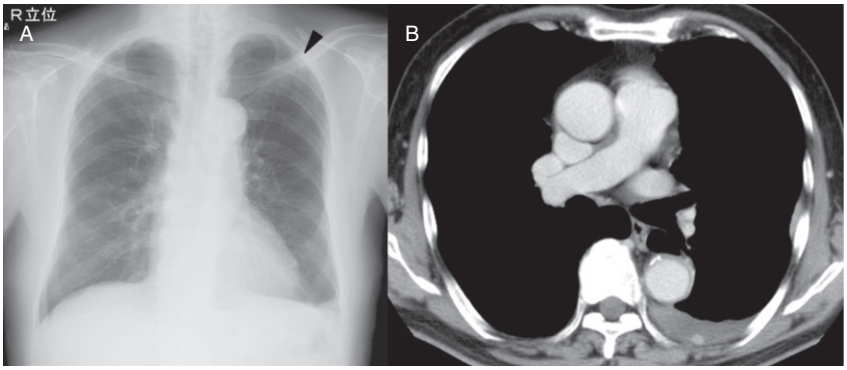

Figure 1. A chest X-ray revealed left costophrenic angle blunting and a well-circumscribed, pleural-based mass in the left upper hemithorax (arrow) (A). A contrast-enhanced computed tomography scan showed well-enhanced noncalcified pleural nodules and a small amount of pleural effusion. There were no pulmonary nodules and no mediastinal lymphadenopathy (B).

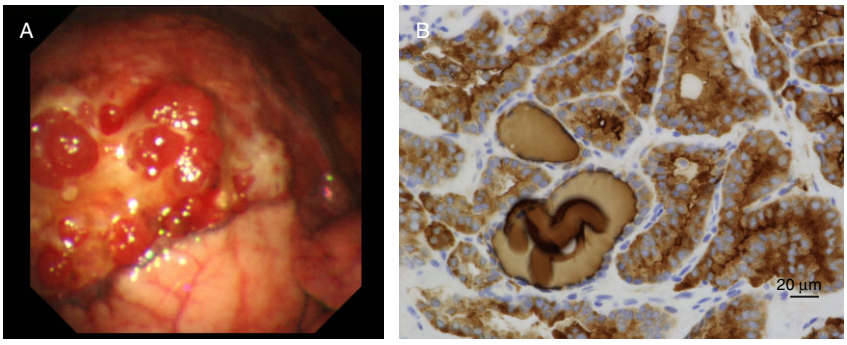

Figure 2. Thoracoscopy showed many vivid red masses at the surface of the pleura (A). Histopathological examination revealed branching papillary structures with columnar cells and colloid material. Immunohistochemical stains were positive for thyroglobulin (cytoplasm and inside of colloid material were stained brown) (B).

Examination of the thoracic cavity revealed many small patchy lesions on the parietal pleura and diaphragmatic pleura. Their surfaces were vivid red that resembled a strawberry, and the tissue was relatively soft, making biopsy easy (Fig. 2A). A small quantity of bloody pleural effusion was observed under the collapsed lung, which had a hemoglobin level of 11.9 mg/dL, not substantially different from the serum hemoglobin level of 15.0 mg/dL. Pleural fluid cytology revealed adenocarcinoma cells with psammoma bodies and intranuclear cytoplasmic inclusions. Histopathological examination of these nodular lesions revealed branching papillary structures with columnar cells and colloid material. Immunohistochemical stains were positive for thyroglobulin (Fig. 2B) and thyroid transcription factor 1. The tumor was therefore diagnosed as pleural metastasis of PTC. After pathological diagnosis, the serum thyroglobulin level was 5670 ng/mL. The patient was discharged 2 days after thoracoscopy under local anesthesia, with no complications. After pleural metastasis was diagnosed, he underwent residual total thyroidectomy and is scheduled to receive radioactive iodine therapy.

Discussion

Malignant pleural effusion typically occurs in patients with lung cancer, malignant mesothelioma, malignant lymphoma, genitourinary tract malignancies, or gastrointestinal tract malignancies. PTC rarely results in pleural metastasis and malignant pleural effusion; the incidence of malignant effusion due to PTC is only 0.6% [1]. Consequently, metastatic PTC is rarely considered a potential cause of pleural effusion or nodules. In some cases, PTC metastasis is detected many years after the initial diagnosis. For example, malignant pleural effusion developed 24 years after treatment for PTC in one case [2]. Most cases of malignant pleural effusion of PTC involve parenchymal metastasis; pleural effusion and pleural metastasis are very rare without involvement of the parenchymal region. Indeed, our case is one of only a few examples. Therefore, thyroid cancer should be considered a cause of malignant pleural effusion and/or pleural nodules, even when these present many years after complete response of PTC. Most previous cases have been diagnosed using pleural effusion

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cytology or measurements of the thyroglobulin level of pleural effusions. In our case, however, thoracic ultrasonography showed only a small quantity of pleural effusion, precluding thoracentesis. Thoracoscopy was performed under local anesthesia to confirm the diagnosis, revealing many small flat patchy or agglutinated lesions with a vivid red, strawberry-like color, as well as bloody pleural effusion, which could suggest hypervascularity. No previous case reports have detailed the forms or colors of pleural metastasis of PTC, but a recent report included pictures of the pleural legion, showing slightly tall masses with shiny white tops and red sides [3]. Another report described dark brown pleural fluid and included video footage of the thoracoscopy, which showed a white to gray mass on the pleura [4]. The authors did not describe the features of the pleural lesion, but a later study reported brown effusion. The authors suggested that the effusion color may have resulted from the extremely high iodine concentration in the pleural effusion (29,000 ng/mL). The features of the pleural lesions in our case do not resemble those of the previous two cases. We suggest that this diversity may result from different levels of thyroglobulin or different histopathological subtypes, but this is mere speculation. Therefore, it is difficult to predict the cytopathological diagnosis based on the presence of pleural masses alone.

The median survival duration after pleural effusion development is reported to be 11 months [1], and most reported cases have had poor prognoses. Therefore, prompt diagnosis of pleural effusion is essential. Thoracoscopy with local anesthesia can be useful for prompt diagnosis when thoracentesis is impossible or unsafe.

Disclosure Statement

No conflict of interest declared.

Appropriate written informed consent was obtained for publication of this case report and accompanying images.

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