Long-Term Survival After Incomplete Resection of Immunohistochemically Diagnosed T0N1 Lung Cancer: Report of a Case

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Abstract
A 63-year-old man who had undergone resection of colon cancer 15 years previously was found to have a right hilar mass on chest X-ray, and an elevated serum carcinoembryonic antigen level. The hilar lymph nodes were resected with the right upper lobe, and the initial diagnosis was colon cancer metastasis to the right hilar lymph nodes. Although the resection was incomplete, and no additional treatment was given, the patient remained free of recurrence for 10 years. This prompted us to reconsider our diagnosis using immunohistochemistry. The resected lymph nodes were found to be positive for thyroid transcription factor 1 (TTF-1) and cytokeratin 7, and negative for surfactant apoprotein (SAP), cytokeratin 20, and napsin A. The neuroendocrine markers and thyroglobulin were also negative. These findings led us to diagnose T0N1 lung cancer. There are reports of patients with clinical T0N1,2 lung cancer having exceptionally good prognoses despite noncurative treatment; however, to our knowledge, this is the first case of a patient with T0N1 lung cancer diagnosed by immunohistochemistry, with a good prognosis despite incomplete resection. In this case, TTF-1 and cytokeratin staining was particularly helpful in the differential diagnosis.

Key words T0N1 lung cancer · Adenocarcinoma · Metastasis · Hilar lymph node

Introduction
Unknown primary cancer metastasis to the hilar or mediastinal lymph nodes is well documented, but relatively uncommon.1-6 We report a case of metastasis of adenocarcinoma to the right lung hilar lymph nodes, which was initially thought to be colon cancer metastasis based on the patient’s past history and histology, but was subsequently diagnosed as T0N1 lung cancer by immunohistochemistry.

Case Report
A 63-year-old man, who had undergone right hemicolectomy for ascending colon cancer, diagnosed as moderately differentiated adenocarcinoma, T3N1M0, Dukes’ C, stage III, 15 years earlier, was referred to our hospital for treatment of a cyst in the upper maxillary sinus. During the course of treatment his serum carcinoembryonic antigen (CEA) level was found to be elevated to 1620 ng/ml, and systemic evaluation was done. Chest X-ray showed a nodular shadow in the right lung hilum (Fig. 1), and chest computed tomography (CT) showed enlargement of the right superior interlobar lymph node (#11s)7 (Fig. 2). No lesions were found in the lung, but gallium scintigraphy showed strong uptake in the right hilum. There was no evidence of gastrointestinal tract recurrence or other metastases.

Bronchoscopy revealed no abnormalities except for a closed posterior upper lobe bronchus; a result of posterior segmentectomy of the right upper lobe to treat pulmonary tuberculosis 39 years earlier.

Since malignant right hilar lymph node enlargement was highly suspected, we performed an explorative thoracotomy. There was extensive intrathoracic adhesion from the previous surgery, with notable enlargement of lymph nodes #11s and the upper lobar lymph nodes (#12u).7 No other intrathoracic lesions were macroscopically evident. Intraoperative biopsy from #11s revealed adenocarcinoma, suspicious of metastasis from colon cancer, on frozen section. Upper sleeve completion lobectomy was necessary to achieve curative resection, but the firm adhesion between the pulmonary
artery and the intermediate bronchus made this impossible. The #11s lymph node was dissected from the intermediate bronchus, and the enlarged hilar lymph nodes were resected by completion lobectomy. Remnant cancer tissue probably remained around the intermediate bronchus.

In the fixed specimen, the enlarged #12u lymph node was seen adjacent to the anterior upper lobe bronchus (Fig. 3, arrow). No lesions were found in the resected upper lobe. Histologic examination revealed that lymph nodes #11s and #12u were extensively infiltrated by metastatic adenocarcinoma (Fig. 4a,b), being similar in appearance on hematoxylin — eosin to the previously resected colon carcinoma (Fig. 4c,d). The serum CEA level had normalized to 3.4 ng/ml by 3 months after the resection.

Our initial diagnosis was metastasis of colon cancer to the hilar lymph nodes, based on the patient’s past history of colon cancer, and the morphology of hematoxylin — eosin staining. The patient was followed up closely because we thought that the appearance of thoracic as well as abdominal metastasis was inevitable, but the patient remained disease-free for 10 years despite no additional treatment. This prompted us to reconsider our diagnosis, using markers that were unavailable at the time of the initial diagnosis. Immunohistochemistry was carried out and comparisons were made between the primary colon lesion and the metastatic lymph nodes. The results indicated that the lymph node metastasis was most likely from lung adenocarcinoma, and hence we made a final diagnosis of T0N1 lung cancer (Table 1).

Discussion

Hematoxylin — eosin staining revealed that the cancer epithelium in the resected lymph nodes from this patient was morphologically of the colonic type rather than the lung type, even when reviewed retrospectively (Fig. 4b). Direct comparisons between lung cancer and colon cancer lung metastases using molecular analyses are still unusual. This is partly because it is considered that the distinction can usually be made morphologically. To our knowledge, thyroid transcription factor 1 (TTF-1) and surfactant apoprotein (SAP) have never been used to directly compare lung cancer and colon cancer. In the present study, SAP and napsin A were