Late Pulmonary Metastasis of a Rectal Cancer
Resected 20 Years after Low Anterior Resection

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A 54-year-old man underwent a low anterior resection for rectal cancer in July 1986. A right pulmonary tumor was pointed out in March 2006 by screening a chest X-ray. Because pulmonary metastasis from colorectal cancer was suspected by transbronchial biopsy, a colonofiberscopy was performed. However, no primary tumor was found. Furthermore, positron emission tomography (PET) revealed no other positive lesion. This tumor was resected in April 2006, and the pathological findings, including immunohistochemical findings, were similar to those of the previously resected rectal cancer. This tumor was therefore diagnosed to be pulmonary metastasis from rectal cancer resected 20 years ago based on a comparison of primary and pulmonary tumors using immunohistochemical examination.

This shows that pulmonary metastasis from colorectal cancer is possible even 20 years after the initial operation. (Ann Thorac Cardiovasc Surg 2008; 14: 386–389)

Key words: pulmonary metastasis, rectal cancer, disease-free interval, metastasectomy

Introduction

Colon cancer frequently metastasizes to the lung. Surgery for resectable pulmonary metastases from colorectal cancer is generally accepted and is curative in most cases. There are some reports that the disease-free interval (DFI) is the predictor of survival after thoracotomy.1,2) We recently treated a patient of pulmonary metastasis from rectal cancer with an extremely long DFI. Pulmonary metastasectomy was performed almost 20 years after the initial operation, and a similarity between primary and metastatic tumors was clearly demonstrated by immunohistochemical examination. To the best of our knowledge, the time interval between initial surgery and pulmonary metastasectomy is the longest as a case report.

Case Report

A 54-year-old man underwent a low anterior resection for rectal cancer in July 1986. The disease was histologically diagnosed as moderately differentiated adenocarcinoma that had invaded the subserosa (Fig. 1d). Focal involvement of lymphatic vessels and venous invasion was seen, but there was no lymph node metastasis. In March 2006, an abnormal shadow was pointed out on a screening chest X-ray (Fig. 2), and the patient was referred to our institution. Computed tomography (CT) revealed a large tumor in the right middle lobe with enlargement of hilar lymph nodes (Fig. 3), and serum carcinoembryonic antigen (CEA) was elevated to...
Fig. 1. Microscopic findings, including immunohistochemical examinations of the pulmonary tumor (a–c), are similar to the previously resected rectal cancer (d–f).

a,d: The tumor cells in hematoxylin and eosin-stained tissue sections (magnification of photographs, ×100).
b,e: The immunohistochemical staining with cytokeratin 20 and both tumors are positive (magnification of photographs: ×400).
c,f: The immunohistochemical staining with cytokeratin 7 and both tumors are positive (magnification of photographs: ×400).
CK, cytokeratin.

212 ng/ml. We performed a bronchofiberscopy, and this tumor was diagnosed as moderately differentiated adenocarcinoma consisting of high columnar tumor cells by transbronchial biopsy. We suspected pulmonary metastasis from colorectal cancer, so colonofiberscopy was performed. However, no primary tumor was found. Furthermore, positron emission tomography (PET) revealed no other positive lesions except for the lung tumor and the hilar lymph nodes. This tumor was therefore diagnosed as pulmonary metastasis from rectal cancer resected 20 years previously or primary lung cancer. A right middle lobectomy and lymph node dissection was performed in April 2006.

Macroscopically, the tumor was 5.5 × 5.0 × 3.0 cm in size and with extensive necrosis. Microscopically, it consisted of moderately differentiated adenocarcinoma with high columnar cells and extensive necrosis (Fig. 2).

Fig. 2. Chest X-ray showing a mass shadow in the right middle lung field.

Fig. 3. Computed tomography scan of the chest showing a large tumor in the right middle lobe and enlargement of hilar lymph nodes.
la). No regions contained components having the usual pulmonary adenocarcinoma histology, including lepidic growth and features of clear cytoplasm. Twenty-seven lymph nodes were examined, and three were metastatic. Immunohistochemical examinations showed tumor cells to be positive for cytokeratin (CK) 20 (Fig. 1b) and CK7 (Fig. 1c), and negative for thyroid transcription factor (TTF)-1. The rectal tumor resected 20 years before the lobectomy was also positive for CK20 (Fig. 1e) and CK7 (Fig. 1f), so we diagnosed this lung tumor as metastasis from rectal cancer resected 20 years ago.

The postoperative course was uneventful, and the patient was discharged on postoperative day 7. The serum CEA level normalized after operation. One year after the operation, however, serum CEA was re-elevated to 66 ng/ml, and recurrence in mediastinal lymph nodes was detected by chest CT. The patient rejected chemotherapy and continued follow-up 14 months after the operation.

Discussion

The lung is among the most common sites of distant metastases from colorectal cancer. Until now, there has been no curative chemotherapeutic treatment for these metastases. So when possible, surgical resection has been accepted as appropriate therapy. Prognostic factors after thoracotomy were discussed by many authors. Rena et al. and Yedibela et al. reported long DFI as one of the important prognostic factors after thoracotomy.1,2) On the other hand, there are some papers stating that DFI does not influence survival after thoracotomy.3-11) Besides DFI, prethoracotomy serum CEA level, hilar and/or mediastinal lymph node metastasis, number of pulmonary metastases, tumor size, and the patient’s age are proposed as candidate prognostic factors.1-10,12-15) Among them, many papers reported that the presence of hilar and/or mediastinal lymph node metastasis and elevated prethoracotomy serum CEA level are poor prognostic factors. The DFI of the present case was almost 20 years (237 months). As shown in Table 1, reported median DFI ranges 20–38.4 months. Sakamoto et al. reported 47 patients with pulmonary metastases from colorectal cancer and DFI ranges 1–260 months.10) To the best of our knowledge, 260 months is the longest DFI, and the present case is the next longest. As a case report, this is the longest one. Kamiyoshihara et al. reported 6 patients with various types of cancer with DFI greater than 10 years and concluded that early death could occur regardless of long DFI.16) The present case exhibited lymph node metastases, and prethoracotomy serum CEA was elevated. These observations suggest poor prognosis, and in fact recurrence at the mediastinal lymph node was seen.

A comparison of primary and pulmonary tumors using immunohistochemical examination will be helpful in the diagnosis of pulmonary tumors with extremely long DFI’s. In this case, it was difficult to determine whether it was pulmonary metastasis from rectal cancer or primary lung adenocarcinoma with enteric differentiation. Inamura et al. reported the histological characteristics of pulmonary adenocarcinoma with enteric differentiation.17) In that paper, they described that all the pulmonary adenocarcinomas with enteric differentiation more or less contained components having a usual pulmonary adenocarcinoma histology, including lepidic growth and features of clear cytoplasm, whereas metastases from colorectal cancer were largely monotonous in histology. The present case

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<thead>
<tr>
<th>Authors</th>
<th>Publication year</th>
<th>No. of patients</th>
<th>Disease-free interval (months)</th>
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<tbody>
<tr>
<td>Sakamoto et al.</td>
<td>2001</td>
<td>47</td>
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<td>Headrick et al.</td>
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<tr>
<td>Rena et al.</td>
<td>2002</td>
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<tr>
<td>Saito et al.</td>
<td>2002</td>
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<tr>
<td>Vogelsang et al.</td>
<td>2004</td>
<td>75</td>
<td>30</td>
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<td>Shiono et al.</td>
<td>2005</td>
<td>89</td>
<td>24.3</td>
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<td>Koga et al.</td>
<td>2006</td>
<td>58</td>
<td>25</td>
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<td>Yedibela et al.</td>
<td>2006</td>
<td>153</td>
<td>29</td>
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<td>Lee et al.</td>
<td>2007</td>
<td>59</td>
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ND, not described.
had no region containing usual pulmonary adenocarcinoma. Furthermore, both rectal and pulmonary tumors were positive for CK7 and CK20. Well/demonstrately differentiated adenocarcinomas in the large intestine showing CK7/CK20 immunophenotype account for less than 10% of cases. In the present case, this rare immunophenotype was seen in both the primary and lung tumors. From the above results, we diagnosed this lung tumor as pulmonary metastasis.

In conclusion, pulmonary metastasis from colorectal cancer is possible 20 years after the initial operation. Thus if the histology of a pulmonary tumor resembles colorectal cancer without colorectal tumor presence, we must review the past history carefully, even going back 20 years.

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References