Mucinous Adenocarcinoma of the Thymus

A Case Report

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Abstract: A mucinous adenocarcinoma of the thymus is rare, and there is presently limited information on the clinical aspects of this uncommon type of tumor. Only six cases have been reported in the literature. A 49-year-old Japanese male presented with an anterior mediastinal mass, and underwent a tumor resection. Histologically the tumor consisted of a mucinous adenocarcinoma with pleural dissemination. Postoperative radiotherapy and chemotherapy were performed. The patient is still alive with pleural dissemination 11 months after surgery.

Key Words: Mucinous carcinoma, Thymic carcinoma, Adenocarcinoma, Thymus.

Thymic carcinoma is a relatively rare neoplasm. In addition, a primary mucinous adenocarcinoma of the thymus is extremely rare,1–5 and it has not yet been classified by the World Health Organization criteria. This report describes a case of mucinous adenocarcinoma with multimodal treatment.

CASE REPORT

A 49-year-old Japanese male visited our hospital complaining of pain in the left shoulder. Chest computed tomography demonstrated a well-circumscribed mass in the anterior mediastinum (Figure 1). The tumor, measuring 8.5 cm in size, presented as a focal heterogeneously enhanced mass with partial calcification. The large part of the tumor was adjacent to the pericardium, and involved the left brachiocephalic vein. Radiologically, there was no lesion in the lung parenchyma. Chest magnetic resonance imaging showed the tumor lacked a capsule and focal high intensity with T2 weighted images. Laboratory data showed no abnormalities such as an elevation of the serum tumor markers. The patient was preoperatively diagnosed to have either an invasive thymoma or thymic carcinoma, and therefore underwent a tumor resection by surgical procedures. During the operation, the tumor was found to be a firm solid mass that extensively adhered to...
the pericardium, while also demonstrating pericardial dissemination. Although the left phrenic nerve was involved, the left brachiocephalic vein was not invaded. A tumor resection was thus performed and the pericardium was repaired. The disease was judged to be Masaoka’s stage IVb.6 Macroscopically, the resected tumor measured 10 cm in size, it was solid with an irregular margin and a capsule. The cut-surface was white-milky with abundant mucin (Figure 2). Microscopically, the tumor cells had hyperchromatic and round nuclei. Scattered clusters of cells floated in pools of extracellular mucin (Figures 3A, B). The mass had a small portion of glandular formation and a stroma. The tumor cells were immunohistochemically positive for cytokeratin 7 and cytokeratin 20, negative for thyroid transcription factor-1 and Cluster of Differentiation 5 (DAKO CA). The pathologic diagnosis of the tumor was a mucinous adenocarcinoma of the thymus. The patient had sequential postoperative chemotherapy with adriamycin, cisplatin, vincristin, and cyclophosphamide (ADOC) after irradiation of the mediastinum (60 Gy). Eleven months later, the patient was alive with aggressive pleural dissemination.

**DISCUSSION**

In thymic epithelial tumors, thymic carcinoma is comparatively rare. The reported frequency is 19.3 to 21.3%.7 Primary mucinous adenocarcinomas of the thymus are extremely rare with only six cases reported in the literature.1–5 Thymic carcinoma is rare so it is necessary to first exclude metastatic and another primary lesions. Although the current case was examined in detail, there was no evidence of lesions elsewhere. Recently, improved immunohistochemical observations have been found to be useful for the differential diagnosis of these tumors. In previous reported cases, they used immunohistochemical examinations and the results showed either weak or diffuse staining for CD 5 in 4 of the 5 cases (Table 1). However, Kapur et al.2 described that CD 5 is not conclusive for primary thymic adenocarcinoma. Therefore, although the tumor cells were immunohistochemically negative for CD 5, the patient was diagnosed to have a primary mucinous adenocarcinoma of the thymus based on the pathologic and the other immunohistochemical findings.

Due to the fact that this disease is rare, it is impossible to conduct randomized control trials, therefore treatment for thymic carcinoma has not yet been established. Hsu et al.8 described that surgery for thymic carcinoma is the primary treatment, and the prognosis of the patients who received a complete resection was found to be better than for those who received an incomplete resection. Currently, those references

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**TABLE 1. Summary of Previous Reports and the Current Case of Mucinous Adenocarcinomas of the Thymus**

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Age/sex</th>
<th>Treatment</th>
<th>Outcome</th>
<th>Immunoreactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ra et al.1</td>
<td>2007</td>
<td>61/F</td>
<td>Resection + RTx</td>
<td>Alive with disease at 5 mo</td>
<td>CD 5 CD 7 CD 20</td>
</tr>
<tr>
<td>Kapur et al.2</td>
<td>2006</td>
<td>41/M</td>
<td>Resection + RTx</td>
<td>Died of complication</td>
<td>+ + +</td>
</tr>
<tr>
<td>Takahashi et al.3</td>
<td>2005</td>
<td>59/M</td>
<td>RTx</td>
<td>Died of disease at 11 mo</td>
<td>+ + –</td>
</tr>
<tr>
<td>Seki et al.4</td>
<td>2004</td>
<td>34/F</td>
<td>Resection</td>
<td>Died of disease at 20 mo</td>
<td>ND ND ND</td>
</tr>
<tr>
<td>Choi et al.5</td>
<td>2003</td>
<td>15/M</td>
<td>Resection + RTx</td>
<td>Died of disease at 26 mo</td>
<td>+ + +</td>
</tr>
<tr>
<td>The current case</td>
<td>2003</td>
<td>49/M</td>
<td>Resection + RTx + CTx</td>
<td>Alive with disease at 11 mo</td>
<td>– + + +</td>
</tr>
</tbody>
</table>

M, male; F, female; RTx, Radiotherapy; CTx, Chemotherapy; –, negative; +, positive; ND, not done.
all stated that a complete resection is a factor which indicates a good prognosis, and Masaoka’s staging system is therefore useful for determining which modality should be chosen. Thymic carcinoma has a poor prognosis and a reported overall 5 year survival rate of 14.5 to 34.4%. Suster and Rosai stated that thymic carcinoma can be divided into two histologic types (low-grade malignancy and high-grade malignancy) and there was a significant difference between them. There are many references that the prognosis of patients with squamous-cell subtype is favorable, so that histologic type of thymic carcinoma may thus a possible prognostic factor. The outcomes of the previous six cases of the mucinous subtype show that three cases were fatal and a poor prognosis is likely. In this case, however, adjuvant therapy was conducted, and the pleural dissemination continued 11 months after surgery.

In conclusion, a rare case of mucinous adenocarcinoma of the thymus was observed and the patient received multimodality treatment. Further clinicopathologic and genetic analysis may lead to a better understanding of this uncommon disease.

REFERENCES