Incidently Discovered Primary Malignant Melanoma of the Trachea

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Abstract

Primary malignant melanoma of the trachea is extremely rare. We report here the first case of primary tracheal malignant melanoma in the asymptomatic stage. Incidentally, this 73-year-old man was found to have a flat tumor at the upper trachea on chest computed tomography scans. The tumor was surgically resected with end-to-end anastomosis and was diagnosed to be primary malignant melanoma of the trachea. Four months after the surgical resection, cervical lymph node metastasis was found. Despite the resection of metastatic lymph nodes and six courses of chemotherapy, he died of cachexia approximately two years after the discovery of the tracheal tumor.

Key words: malignant melanoma, trachea, surgery, chemotherapy

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Introduction

It has been reported that about 75% of primary tracheal carcinomas are squamous cell carcinoma or adenoid cystic carcinoma (1). Most cases of tracheal malignant melanoma are metastatic from the skin while primary malignant melanoma of the trachea is extremely rare (2-9). Here, we report the first case of primary tracheal malignant melanoma found by chance without symptoms.

Case Report

In October 2008, a 73-year-old man underwent a medical check-up and a lung nodule was suspected in the left lung field based on chest X-ray findings. The chest computed tomography (CT) scans did not reveal any nodule in the lung fields, however a flat tumor was detected at the membranous portion of the upper trachea. The tumor was located 3 cm caudal to the vocal cords (Fig. 1A, B). For further examination, he admitted to our hospital. On admission, the patient did not have any respiratory symptom, such as cough, dyspnea, wheeze or hemoptysis. Physical examination detected no abnormalities including lung field auscultation. Bronchosscopic examination showed a smooth, non-pigmented, flat tumor with hypervascularity at the membranous portion of the upper trachea with a diameter of about 9 mm (Fig. 1C, D). The tumor biopsy specimens contained accumulated spindle-shaped atypical cells and malignant melanoma was suspected as a diagnosis. Again, we examined his skin and eyes, but no abnormal findings were observed. The whole body CT scans and the magnetic resonance images of the brain did not provide any sign of lymph node swelling or distant metastasis. In May 2009, the tumor was surgically resected and end-to-end anastomosis was performed. The histopathological examination of the tumor revealed the proliferation of spindle-shaped atypical cells which were positive for HMB45, S100 and Melan-A (Fig. 2). In addition, intracytoplasmic melanocytic pigmentation was present in these cells, confirming the diagnosis of malignant melanoma of the trachea. The invasion to lymphatic vessels was present in the resected specimens. Four months after the surgical resection, cervical lymph node swelling was detected in the CT scans. Lymph node resection was undertaken and metastasis was histologically proven. Thereafter, he received five courses of DAVFeron (dacarbazine, nimustine hydro-
Figure 1.  (A) (B) Chest CT showing intraluminal tumor (arrow) in the upper trachea. (C) (D) A bronchoscopic examination showing the non-pigmented flat tumor in the upper trachea.

Figure 2. The specimens of the tumor obtained by surgical resection. (A) Spindle-shaped atypical cells with intracytoplasmic melanocytic pigmentation (Hematoxylin and Eosin staining, original ×100). (B) (C) (D) An immunohistochemistry showing the spindle-shaped atypical cells positive for HMB-45 (B), S100 (C), and Melan-A (D) (original ×100).
Table 1. Clinical Profiles from Patients with Primary Malignant Melanoma of the Trachea

<table>
<thead>
<tr>
<th>Case</th>
<th>Age</th>
<th>Sex</th>
<th>Symptoms</th>
<th>Location of tumor</th>
<th>Bronchoscopic or operative appearance</th>
<th>Obstruction of tracheal lumen</th>
<th>Lymph node metastasis</th>
<th>Distant metastasis</th>
<th>Treatment</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35</td>
<td>M</td>
<td>Hemoptysis</td>
<td>Mem</td>
<td>2.5 x 3.5 x 2 cm Rubbery firmness, gray mottled tumor with brown streaks</td>
<td>75%</td>
<td>N</td>
<td>N</td>
<td>Complete resection</td>
<td>Tracheal reconstruction</td>
</tr>
<tr>
<td>2</td>
<td>47</td>
<td>F</td>
<td>Shortness of breath</td>
<td>Mem</td>
<td>1.5 cm in diameter Bluish flat tumor</td>
<td>-</td>
<td>Y</td>
<td>N</td>
<td>Complete resection</td>
<td>End-to-end anastomosis</td>
</tr>
<tr>
<td>3</td>
<td>46</td>
<td>M</td>
<td>Cough, Fatigue, Low back pain, Pain behind the sternum</td>
<td>Mem</td>
<td>0.5 to 1 cm in diameter Numerous spot with dark brown pigment, round and oval</td>
<td>-</td>
<td>Y</td>
<td>N</td>
<td>Dacarbazine</td>
<td>BCG</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>32</td>
<td>F</td>
<td>Hemoptysis, Weight loss, Hoarseness</td>
<td>Car</td>
<td>1 x 0.8 cm Irregular, raised, brown-black mass</td>
<td>85%</td>
<td>Y</td>
<td>N</td>
<td>Complete resection</td>
<td>End-to-end anastomosis</td>
</tr>
<tr>
<td>6</td>
<td>29</td>
<td>F</td>
<td>Dyspnea</td>
<td>Car</td>
<td>Large vegetating mass</td>
<td>90%</td>
<td>N</td>
<td>N</td>
<td>Complete resection</td>
<td>End-to-end anastomosis</td>
</tr>
<tr>
<td>7</td>
<td>22</td>
<td>M</td>
<td>Dyspnea, Hoarseness</td>
<td>Mem</td>
<td>1.5 x 2 cm Smooth-bordered, solid, black mass</td>
<td>80%</td>
<td>N</td>
<td>N</td>
<td>Complete resection</td>
<td>End-to-end anastomosis</td>
</tr>
<tr>
<td>8</td>
<td>28</td>
<td>M</td>
<td>Dyspnea, Hoarseness, Shortness of breath, Hemoptysis</td>
<td>Car</td>
<td>Nodular surface</td>
<td>90%</td>
<td>N</td>
<td>N</td>
<td>Complete resection</td>
<td>→ Lymph node resection</td>
</tr>
<tr>
<td>Our case</td>
<td>73</td>
<td>M</td>
<td>No symptoms</td>
<td>Mem</td>
<td>0.9 cm in diameter Smooth, non-pigmented, flat tumor with hypervascularity</td>
<td>5%</td>
<td>Y</td>
<td>N</td>
<td>Complete resection</td>
<td>→ Lymph node resection</td>
</tr>
</tbody>
</table>

M: male, F: female, Mem: membranous portion, Car: cartilage portion, N: No, Y: Yes, DAVFeron: dacarbazine, nimustine hydrochloride, vincristin, and interferon-β, DACTam: dacarbazine, nimustine hydrochloride, cisplatin, tamoxifen, “-“: not known or not done

Discussion

Primary tracheal malignant melanoma is extremely rare (2-9). There are some hypotheses regarding the pathogenesis of lower respiratory tract malignant melanoma: melanocyte migration during embryogenesis, transformation of respiratory epithelial cells to melanocytes, and differentiation of neuroendocrine cells to melanocytes (10, 11). Clinically and histologically, the present case fulfilled the definition of primary tracheal malignant melanoma by Verweij et al. (7):

Clinically: 1) one or several malignant melanomas in the trachea; 2) a pattern of lymph node metastases comparable to that of other bronchial tumors; 3) absence of previously diagnosed malignant melanoma elsewhere in the body; 4) absence of indications of any primary malignant melanomas elsewhere at the time of operation or postmortem (although neither this nor point 3 are at all conclusive).

Histologically: 1) the presence of cytological malignant melanocytic cells in a tracheo-bronchial epithelium without ulceration; 2) junctional activity, i.e., cytologically malignant melanotic cells proliferate in a pagetoid way in the epithelium and infiltrate the underlying stroma; 3) when the trachea-bronchial melanomas are melanocytic, the metastasis may be melanotic or amelanotic, while a primary amelanotic trachea-bronchial malignant melanoma never has melanotic metastasis.

Only eight cases of primary tracheal malignant melanoma have been reported in the literature (Table 1). All of the previous cases have been discovered with respiratory symptoms such as dyspnea, cough, shortness of breath or hemoptysis. Especially in the cases who complained shortness of breath or dyspnea, the tumor occupied 80-90% of the tracheal lumen (cases 5-8 in Table 1). In the present case, the tumor occupied only 5% of the tracheal lumen and he had no complaint of dyspnea. Our case is the first case of primary tracheal malignant melanoma found incidentally without subjective symptoms.
The standard medication of primary malignant melanoma has not been established because of its scarcity. A previous paper reported three surviving patients with primary malignant melanoma of trachea. The authors discussed that complete resection of the tumor and end-to-end anastomosis would be associated with a favorable prognosis (4). Identical treatment was administered to the present case in the asymptomatic stage. The tumor was small and there was no evidence of distant metastasis at initial presentation; however, unfortunately invasion to lymphatic vessels was present in the resected specimens. After all, cervical lymph node metastasis appeared shortly after the surgery and he had a bad prognosis. Probably, the prognosis depends on the presence of invasion to lymphatic vessels leading to lymph node metastasis and distant metastasis similar to that of primary skin malignant melanoma.

Chemotherapy and immunotherapy for the primary tracheal malignant melanoma may be disappointing (4, 6). In accordance with the regimens of primary skin malignant melanoma, the present patient was treated with five courses of the DAVFeron therapy as adjuvant chemotherapy and one course of the DACTam therapy in the advanced stage. Unfortunately however these chemotherapies also could not provide an excellent prognosis. New molecular target therapies, such as BRAF inhibitor, imatinib, and ipilimumab, could be applicable for advanced tracheal malignant melanoma in the near future.

The authors state that they have no Conflict of Interest (COI).

Acknowledgement

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References