Multiple Primary Cancers of the Esophagus and Thyroid Gland

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The occurrence of multiple primary cancers in the aerodigestive tract is a well known phenomenon that has been explained by the concept of 'field carcinogenesis'. Metachronous or synchronous esophageal cancer has usually been identified in patients with head and neck cancer, gastric cancer or colon cancer. The incidence of multiple primary cancers of the esophagus and thyroid gland is very low. We treated four patients with synchronous cancers of the cervical esophagus and the thyroid gland. Histologically, all of the esophageal cancers were squamous cell carcinomas. Thyroid cancers were evaluated as papillary carcinoma or follicular carcinoma. Both the esophageal cancer and the thyroid cancer frequently metastasized to lymph nodes. All patients had multiple lymph nodes metastasis from the esophageal or the thyroid cancer. In one patient, both the esophageal and the thyroid cancers were detected in the same lymph node. Three of four patients died from recurrence of esophageal cancer. The prognosis of these patients was poor. In the treatment of esophageal carcinoma, cancers of other organs including the thyroid gland should be carefully investigated.

Key words: multiple primary cancers – esophageal cancer – thyroid cancer

INTRODUCTION

Along with the increasing proportion of elderly people and technical advances in early diagnosis and treatment of cancer, the incidence of multiple primary cancers has recently increased. In patients with esophageal carcinoma, the incidence of synchronous or metachronous multiple primary cancers including head and neck carcinoma and gastric cancer has increased (1,2). There are few detailed case reports on multiple primary cancers involving the esophagus and thyroid gland. We report four patients with multiple primary cancers of the thyroid gland that simultaneously accompanied cervical esophageal carcinoma and describe the mode of lymph node metastasis.

CASES

CASE 1. A 46-YEAR-OLD FEMALE

Cervical esophagectomy, total laryngectomy, total thyroidectomy and reconstruction by free jejunal graft were performed. An esophageal carcinoma measuring 6.2 x 4.0 cm evaluated as cervical esophagus (Ce), Type 1, a3 (larynx) n3(+) m0 p10 and stage IV and a thyroid cancer evaluated as PT2 pN1b pM0 n2 mO (a node measuring 1.5 x 1.4 x 1.2 cm in the right lobe and a node measuring 1.6 x 1.3 x 0.9 cm in the left lobe) were concurrently detected (3,4). Histopathologically, esophageal carcinoma was evaluated as poorly differentiated squamous cell carcinoma, ly1 and v0. Thyroid cancer in the right lobe was evaluated as papillary carcinoma and that in the left lobe was evaluated as follicular carcinoma. Lymph node metastases from esophageal carcinoma were detected at the #102R and #106 (top) and lymph node metastases from thyroid cancer were detected at the #100R,L, #101, #102L and #104R,L (Fig. 1).

CASE 2. A 56-YEAR-OLD FEMALE

Total esophagectomy (laryngeal preservation), right thyroidectomy and reconstruction by esophago-colostomy were performed. An esophageal carcinoma measuring 6.8 x 3.0 cm was evaluated as Celu, Type 1, a2 n4(+) m0 p10 and stage IV. Histopathologically, the esophageal carcinoma was evaluated as poorly differentiated squamous cell carcinoma, ly1 and v0. Thyroid cancer was evaluated as papillary carcinoma. Lymph node metastases from esophageal carcinoma were detected at the #101 and #104R,L and lymph node metastases from thyroid cancer were detected at the #101, #102R and #104R. At the #102L, metastases from both esophageal carcinoma and thyroid cancer were found in the same lymph node (Figs 1 and 2).
Figure 1. Lymph node metastases of esophageal cancer and/or thyroid cancer in each case. Thyroid cancer metastasized to regional lymph nodes in all cases. Metastasis of esophageal cancer was detected in an abdominal lymph node of case 4.

CASE 3. A 55-YEAR-OLD FEMALE

Cervical esophagectomy, total laryngectomy, total thyroidectomy and reconstruction by free jejunal graft were performed. An esophageal carcinoma measuring 7.5 × 4.0 cm was evaluated as CePh, Type 1, a2 n(−) m0 pT4 and stage III. Thyroid cancer was evaluated as pT4 pN16b pM0. Histopathologically, the esophageal carcinoma was evaluated as well differentiated squamous cell carcinoma, a2, ly1 and v0. Thyroid cancer was evaluated as papillary carcinoma (diffuse). Lymph node metastases from
Figure 2. Metastatic foci from both esophageal cancer and thyroid cancer in the same lymph node (#102). Right arrow, esophageal cancer (squamous cell carcinoma); left arrow, thyroid cancer (papillary carcinoma).

thyroid cancer were detected at the #102R.L and #104R.L. There was no lymph node metastasis from esophageal carcinoma (Fig. 1).

CASE 4. A 74-YEAR-OLD MALE

Total esophagectomy, total laryngectomy, right thyroidectomy and reconstruction with the subtotal stomach were performed. An esophageal carcinoma measuring 7.5 x 5.0 cm was evaluated as CePh, Type 2, a3 n4 m0 p10 and stage IV. At the abdominal esophagus (Ea), a tumor measuring 4.2 x 3.1 cm (0–IIc+IIb) was found. Thyroid cancer was evaluated as pT2 pN1b pM0. Histopathologically, esophageal carcinoma was evaluated as moderately differentiated squamous cell carcinoma, ly0 and v0. Thyroid cancer was evaluated as follicular carcinoma. Lymph node metastases from esophageal carcinoma were detected at the #102R.L and #2 and lymph node metastases from thyroid cancer were detected at the #101 (Fig. 1).

DISCUSSION

Technical advances in cancer diagnosis have increased the incidence of multiple primary cancers simultaneously diagnosed at the detection of esophageal carcinoma. Warren and Gates (5) defined multiple primary cancers as satisfying the following three conditions: (i) each tumor shows specific malignant findings; (ii) two cancers differ in site; and (iii) one tumor is not a metastatic focus from the other tumor. Very few investigators have studied the incidence of multiple primary cancers in patients with esophageal cancer and the incidence ranges from 8.3 to 12.6% (2). Multiple primary cancers included head and neck cancers (such as hypopharyngeal cancer, tongue cancer and laryngeal cancer), gastric cancer and colon cancer (2). In these organs, it is suggested that chemical and physical stimuli related to carcinogenesis exist in the pathway from the oral cavity to the esophagus, stomach and large intestine, following the process of field carcinogenesis (6).

Table 1. Esophageal carcinoma with synchronous or metachronous primary carcinoma in thyroid gland

<table>
<thead>
<tr>
<th>Reporters</th>
<th>Date</th>
<th>Age</th>
<th>Gender</th>
<th>Esophagus (location, stage)</th>
<th>Thyroid (location, stage)</th>
<th>Treatment</th>
<th>Prognosis (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Synchronous</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>1. Hamanaka (8)</td>
<td>1975</td>
<td>67</td>
<td>Female</td>
<td>scc (1m, IV)</td>
<td>pap</td>
<td>Radiation, gastrostomy</td>
<td>12, died</td>
</tr>
<tr>
<td>2. Hamanaka (8)</td>
<td>1975</td>
<td>69</td>
<td>Female</td>
<td>scc (Ei, unknown)</td>
<td>fol</td>
<td>Radiation, esophagectomy, total thyroidectomy</td>
<td>12, died</td>
</tr>
<tr>
<td>3. Takeshita (9)</td>
<td>1978</td>
<td>59</td>
<td>Male</td>
<td>scc (Iulm, IV)</td>
<td>fol</td>
<td>Esophagectomy, thyroidectomy</td>
<td>19, alive</td>
</tr>
<tr>
<td>4. Yoshinaka (10)</td>
<td>1980</td>
<td>58</td>
<td>Male</td>
<td>scc (Ei, IV)</td>
<td>fol</td>
<td>Esophagectomy, thyroidectomy</td>
<td>2, died</td>
</tr>
<tr>
<td>5. Nishida (11)</td>
<td>1988</td>
<td>54</td>
<td>Female</td>
<td>scc (Ce, IV)</td>
<td>pap</td>
<td>Laryngopharyngectomy, blunt dissection, thyroidectomy</td>
<td>14, alive</td>
</tr>
<tr>
<td>6. Our case 1</td>
<td>1990</td>
<td>46</td>
<td>Female</td>
<td>scc (Ce, IV)</td>
<td>fol</td>
<td>Laryngopharyngectomy, cervical</td>
<td>20, died</td>
</tr>
<tr>
<td>7. Our case 2</td>
<td>1990</td>
<td>56</td>
<td>Female</td>
<td>scc (Ce, IV)</td>
<td>pap</td>
<td>Esophagectomy, total thyroidectomy</td>
<td>22, died</td>
</tr>
<tr>
<td>8. Our case 4</td>
<td>1991</td>
<td>74</td>
<td>Male</td>
<td>scc (CePh, IV)</td>
<td>fol</td>
<td>Laryngopharyngectomy, total esophagectomy, thyroidectomy</td>
<td>10, died</td>
</tr>
<tr>
<td>9. Our case 3</td>
<td>1993</td>
<td>55</td>
<td>Female</td>
<td>scc (CePh, IV)</td>
<td>pap</td>
<td>Laryngopharyngectomy, cervical esophagectomy, total thyroidectomy</td>
<td>14, alive</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reporters</th>
<th>Date</th>
<th>Age</th>
<th>Gender</th>
<th>Esophagus (location, stage)</th>
<th>Thyroid (location, stage)</th>
<th>Treatment</th>
<th>Period (years)</th>
<th>Esophagus</th>
<th>Prognosis (months)</th>
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<tr>
<td><strong>Metachronous</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1. Takebayashi (12)</td>
<td>1976</td>
<td>66</td>
<td>Female</td>
<td>scc (1m, IV)</td>
<td>fol</td>
<td>Thyroidectomy</td>
<td>6</td>
<td>Radiation</td>
<td>Unknown</td>
</tr>
<tr>
<td>2. Yoshinaka (10)</td>
<td>1980</td>
<td>53</td>
<td>Female</td>
<td>scc (Ce, IV)</td>
<td>pap</td>
<td>Total thyroidectomy</td>
<td>6</td>
<td>Gastrostomy</td>
<td>84, died</td>
</tr>
<tr>
<td>3. Izumi (13)</td>
<td>1981</td>
<td>69</td>
<td>Male</td>
<td>scc (Ce, unknown)</td>
<td>pap</td>
<td>Radiation</td>
<td>7</td>
<td>Enterostomy</td>
<td>82, died</td>
</tr>
</tbody>
</table>

scc, Squamous cell carcinoma; pap, papillary carcinoma; fol, follicular carcinoma.
The incidence of multiple primary cancers involving the esophagus and thyroid gland is low (2,7). Since Hamanaka et al. (8) reported multiple primary cancers involving the esophagus and thyroid gland in 1975, 12 patients including our series have been reported in detail (Table 1) (9–13). The male-to-female ratio was 1:2, showing that these multiple primary cancers were more common among females. The mean patient age was 60.4 years. Nine patients had simultaneous double cancer and three patients had metachronous multiple primary cancers. In seven of 12 patients, esophageal carcinoma developed in the neck. Most of these patients had advanced cancer according to clinical staging. Histologically, esophageal carcinoma was evaluated as squamous cell carcinoma in all patients. Thyroid cancer was evaluated as papillary carcinoma or follicular carcinoma in the same proportions of patients including those in which the bilateral lobes were affected. In three patients with metachronous double cancer, thyroid cancer primarily developed. The interval between the development of the primary cancer and the development of esophageal carcinoma was similar, ~6 years.

The biological malignancy of thyroid cancer varies among histological types (14). In the four patients we investigated, lymph node metastases from thyroid cancer were detected. However, these patients died of recurrent esophageal carcinoma. This might be because these patients had advanced esophageal carcinoma. The malignancy of thyroid cancer tends to be more severe in elderly people (15). Surveillance for aerodigestive tract cancers and cancers in other organs including the thyroid gland during the preoperative evaluation of esophageal cancer patients and postoperative follow-up are warranted (16,17).

References