Perigastric Lymph Node Metastasis from Papillary Thyroid Carcinoma in a Patient with Early Gastric Cancer: The First Case Report

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Distant metastasis from papillary thyroid carcinoma (PTC), particularly from papillary thyroid microcarcinoma, is rare. We present a case of perigastric lymph node metastasis from PTC in a patient with early gastric cancer and breast cancer. During post-surgical follow-up for breast cancer, a 56-year-old woman was diagnosed incidentally with early gastric cancer and synchronous left thyroid cancer. Therefore, laparoscopic distal gastrectomy with lymph node dissection and left thyroidectomy were performed. On the basis of the pathologic findings of the surgical specimens, the patient was diagnosed to have papillary thyroid microcarcinoma with perigastric lymph node metastasis and early gastric cancer with mucosal invasion. Finally, on the basis of immunohistochemical staining with galectin-3, the diagnosis of perigastric lymph node metastasis from PTC was made. When a patient has multiple primary malignancies with lymph node metastasis, careful pathologic examination of the surgical specimen is necessary; immunohistochemical staining may be helpful in determining the primary origin of lymph node metastasis.

Key Words: Thyroid neoplasms; Lymph nodes; Neoplasm metastasis; Stomach neoplasms

Introduction

Thyroid cancer is a common malignancy worldwide. The prognosis of differentiated thyroid cancer, including papillary thyroid carcinoma (PTC) and follicular carcinoma, is favorable, with patients achieving long-term survival, except in some unusual cases.¹

The incidence of distant metastasis from differentiated thyroid cancer is low, with distant metastasis from PTC, particularly from papillary thyroid microcarcinoma, being especially rare. The most common sites of distant metastasis from thyroid cancer are the lung

and bone, and less common sites of distant metastasis from differentiated thyroid cancer include the brain, breast, liver, and kidney.² However, there are no reports of patients with perigastric lymph node metastasis from PTC.

Herein, we present the case of a patient with early gastric cancer who was diagnosed with PTC with perigastric lymph node metastasis. To the best of our knowledge, this is the first reported case of perigastric lymph node metastasis from PTC.

Case Report

A 56-year-old woman was referred to our hospital for the surgical treatment of gastric cancer in September 2006. She had a medical history of hypothyroidism, and 3 months before, she had undergone lumpectomy with axillary lymph node dissection for left breast invasive ductal carcinoma at a different hospital. During a follow-up esophagogastroduodenoscopy, she was diagnosed

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Received August 26, 2014
Revised September 22, 2014
Accepted September 23, 2014

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incidentally with early gastric cancer (Fig. 1). Endoscopic biopsy revealed moderately differentiated tubular adenocarcinoma in the midbody of the anterior abdominal wall. Abdominal computed tomography (CT) revealed neither regional lymph node metastasis nor distant metastasis. Because the patient had a history of hypothyroidism, we performed ultrasonography for further evaluation of the thyroid. A small calcified mass was detected in the upper pole of the left thyroid gland (Fig. 2), and fine-needle aspiration biopsy (FNAB) was performed to rule out thyroid malignancy. Although fine-needle aspiration revealed lymphocytic thyroiditis without evidence of malignancy, the thyroid ultrasonographic find-

Fig. 1. Esophagogastroduodenoscopy showing a shallow depressed lesion (early gastric cancer type IIc+IIa) in the midbody of the anterior abdominal wall.

ings indicated a high possibility of thyroid malignancy; therefore, we planned thyroidectomy with gastrectomy for gastric cancer. The patient underwent laparoscopy-assisted distal gastrectomy, loop gastrojejunostomy, and D2 lymphadenectomy for gastric cancer, and left thyroidectomy with isthmectomy and central lymph node dissection for the left thyroid mass. The operation took 345 minutes, and there were no intraoperative complications.

Pathological examination of the permanent sections revealed a papillary thyroid microcarcinoma (8 mm) with lymphocytic thyroiditis and metastasis in 1 out of 4 lymph nodes (Fig. 3). The gastric cancer was poorly differentiated tubular adenocarcinoma that had invaded into the muscularis mucosa (Fig. 4). The most notable finding along with the gastric cancer was the presence of multiple perigastric lymph node metastases. After gastrectomy with lymph node dissection, 8 out of 55 lymph nodes showed metasta-

Fig. 2. Thyroid ultrasonography showing a solid oval-shaped nodule (0.87 cm) with multiple tiny calcifications in the upper pole of the left thyroid gland.

Fig. 3. Microscopic findings of thyroid cancer. (A) A classical papillary microcarcinoma showing an infiltrative pattern and arborizing papillary architecture in the left thyroid (H&E, ×40). (B) The tumor cells showing characteristic nuclear features of papillary carcinoma: the nuclei are large, crowded, oval, optically clear, and grooved, with small distinct nucleoli (H&E, ×400).

Fig. 4. Microscopic findings of gastric cancer. (A) The lesion showing slight depression and confined to the muscularis mucosa (H&E, $\times 40$). (B) The tumor cells showing irregular pleomorphic nuclei with prominent nucleoli and form a lace-like gland or delicate microtrabecular pattern (H&E, $\times 40$).

Fig. 5. Microscopic findings of metastatic perigastric lymph nodes. (A) Lymph nodes along the lesser curvature showing many glandular structures, suggesting gastric carcinoma metastasis (H&E, $\times 40$). (B) Higher magnification of the tumor cells showing large oval nuclei with ground glass or hypochromatic appearance and abundant eosinophilic cytoplasm, reminiscent of a thyroid papillary carcinoma (H&E, $\times 400$). (C) Immunohistochemical staining for galectin-3 confirms metastasis of thyroid papillary carcinoma in the perigastric lymph nodes ($\times 200$).

ses. All lymph nodes with metastases were located along the lesser curvature of the stomach. Initially, we theorized that the perigastric lymph node metastases had originated from gastric cancer; there-

fore, the TNM stage of the gastric cancer was determined to be T1aN2M0 (6th American Joint Committee on Cancer TNM staging system). Because multiple lymph node metastases from early gas-

tric cancer, especially from mucosal cancer, are rare, we performed immunohistochemical staining of a specimen of metastatic perigastric lymph nodes. Microscopic examination of these metastatic tumor cells showed thyroid cancer cells. Immunohistochemical staining was positive for galectin-3, but negative for thyroglobulin (Fig. 5). Finally, we confirmed that the perigastric lymph node metastases originated from thyroid cancer.

After thyroidectomy, the patient was administered Synthroid. She was discharged without complications on postoperative day 10. Thus far, the patient has been alive for 8 years postoperatively, without recurrence of gastric, breast, or thyroid cancer.

Discussion

PTC is usually characterized by slow progression and is associated with long-term survival. High 10-year survival rates of 80-90% have been reported for patients with differentiated thyroid carcinoma.¹

Although lymph node metastasis from differentiated thyroid carcinoma occurs frequently, the incidence of distant metastasis from differentiated thyroid cancer is low, ranging from 4% to 15%, with variations in this rate for PTC and follicular thyroid carcinoma.^{2,3} Shaha et al.² reported that the incidence of distant metastasis was only 2.3% in patients with PTC, but was 11% in patients with follicular carcinoma.

The most common sites of distant metastasis from thyroid cancer are the lung and bone, whereas less common sites of distant metastasis from PTC include the brain, breast, liver, kidney, adrenal gland, ovary, muscle, skin, stomach, or axillary lymph nodes.^{4,5} However, there are no cases of patients with perigastric lymph node metastasis from PTC.

Further, it is difficult to diagnose occult distant metastasis from PTC. This condition can be detected incidentally during a specific study or on pathologic findings with FNAB or those obtained postoperatively, as was the case for our patient. Whole body ¹³¹I-scintigraphy and ¹³¹I-single-photon emission CT are very useful tools for diagnosing distant metastasis from thyroid cancer.^{4,5}

Early gastric cancer is defined as tumor invasion into the mucosal and submucosal layers of the stomach with or without lymph node metastasis. Although the rate of lymph node metastasis for early gastric cancer is approximately 20% in patients with submucosal cancer, this rate for mucosal cancer is < 5%.⁶ Our patient had a 1.5-cm mucosal gastric cancer with no lymphovascular invasion; therefore, the probability lymph node metastasis was very low. After additional review and immunohistochemical staining (which

was positive for galectin-3), the final pathologic report revealed that the perigastric lymph node metastases had originated from the PTC.

Perigastric lymph nodes typically drain lymphatic fluid from the stomach; therefore, most of such metastases originate from the stomach, which is an unusual site for metastasis from other malignancies. Although some studies have reported metastases to the stomach, they are few in number.⁷ Oda et al.⁸ studied metastases to the stomach in 347 autopsy cases, and of these metastases cases, only 6.4% (7 cases in 110 autopsies) originated from a primary thyroid cancer. In our patient, we initially theorized that the perigastric lymph node metastases originated from metastatic gastric cancer. However, the cellular morphology of the gastric cancer cells differed from that of the thyroid cancer cells; therefore, this theory was rejected.

Galectin-3 plays a role in the regulation of apoptosis, cell motility, and T-cell growth, and is also associated with tumor progression in thyroid cancer. The sensitivity and specificity of galectin-3 immunohistochemical staining alone in discriminating benign from malignant thyroid lesions is greater than 90% and 98%, respectively, and its diagnostic accuracy is 99%. Cytoplasmic galectin-3 expression on immunohistochemical staining could be a reliable marker for diagnosing PTC.⁹ In our patient, metastatic perigastric lymph nodes were positive for galectin-3. Therefore, the final diagnosis of perigastric lymph node metastasis originating from PTC was based on the microscopic findings of the samples after hematoxylin-eosin staining and strong cytoplasmic staining for galectin-3 on immunohistochemistry.

In summary, our patient had metachronous breast cancer, synchronous PTC, and early gastric cancer (triple cancer), with the rare finding of perigastric lymph node metastases from PTC rather than from gastric cancer. The definitive diagnosis of perigastric lymph node metastases from PTC could be made after immunohistochemical staining for galectin-3. Therefore, when a patient with PTC undergoes additional surgical resection for a distinct pathologic problem, it is necessary to carefully determine the histologic diagnosis of all specimens and to consider the possibility of distant metastasis from the PTC.

To our knowledge, this is the first reported case of perigastric lymph node metastases from PTC in a patient with early gastric cancer.

Acknowledgments

This work was supported by the Soonchunhyang University

Research Fund.

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