

Axillary Lymph Node Metastasis from Papillary Thyroid Carcinoma: Report of a Case

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Abstract

We report a case of axillary lymph node metastasis (LNM) from papillary thyroid carcinoma (PTC) in a 21-year-old man. The patient presented with bilateral cervical and right axillary lymphadenopathy, and computed tomography (CT) showed a primary tumor of the thyroid and gross lymphadenopathy from the neck to the right axilla. We performed a total thyroidectomy with therapeutic nodal dissection. The resection of the primary thyroid tumor and all the node metastases was curative. Pathological examination confirmed that the resected lesions were PTC and nodal metastases from the primary tumor. Six years after the operation, cervical, upper mediastinal, and axillary lymph node recurrence developed and multiple lung metastases were found on a CT scan. He was treated with radioactive iodine therapy. Axillary LNM from PTC is unusual and seems to be associated with a poor prognosis. Thus, comprehensive treatment strategies are needed to improve the outcome of patients with PTC who present with axillary LNM.

Key words Papillary thyroid carcinoma · Axillary lymph node metastasis · Radioactive iodine therapy

Introduction

Papillary thyroid carcinoma (PTC) is the most common thyroid malignancy. Cervical lymph node metastasis (LNM) is common,^{1,2} but axillary LNM is rare. Very few cases of axillary LNM from thyroid carcinoma have been reported.^{3–8} We report a case of axillary LNM from

PTC, and discuss the clinical implications of this condition.

Case Report

A 21-year-old man was referred to Yokohama City University Hospital for investigation of bilateral cervical and right axillary lymphadenopathy. Computed tomography (CT) showed a primary tumor, 4 cm in diameter, in the right lobe of the thyroid and a gross mass consisting of the cervical, supraclavicular, and right axillary lymph nodes (Fig. 1a). There was no evidence of lung metastasis. Magnetic resonance imaging (MRI) showed that the right cervical lymph nodes were contiguous with the right axillary lymph nodes (Fig. 1b). Cytologic examination of tissue obtained by fine-needle aspiration biopsy revealed PTC with LNM. The patient underwent a total thyroidectomy with therapeutic nodal dissection. The PTC and all nodal metastases, including those to the right axillary lymph nodes, were curatively dissected (Fig. 2). Histopathological examination confirmed that both the resected thyroid tumor and the lymphadenopathy were well differentiated PTC with sporadic areas of poorly differentiated tumor cells (Fig. 3). The patient received TSH suppression therapy, but radioactive iodine (RI) therapy was not given because he had stage I disease (according to the 6th edition of the International Union Against Cancer TNM classification of malignant tumors) and the lesions were resected completely. Subsequently, his serum thyroglobulin (Tg) level decreased to 120 ng/ml from over 800 ng/ml.

Unfortunately, 6 years later, LNM recurred in the neck, upper mediastinum, and right axilla and asymptomatic multiple lung metastases were detected on a CT scan. We gave the patient three courses of RI therapy because RI uptake was detected in the disseminated lung metastases (Fig. 4). The uptake of RI was good during all three courses, and the serum Tg level was

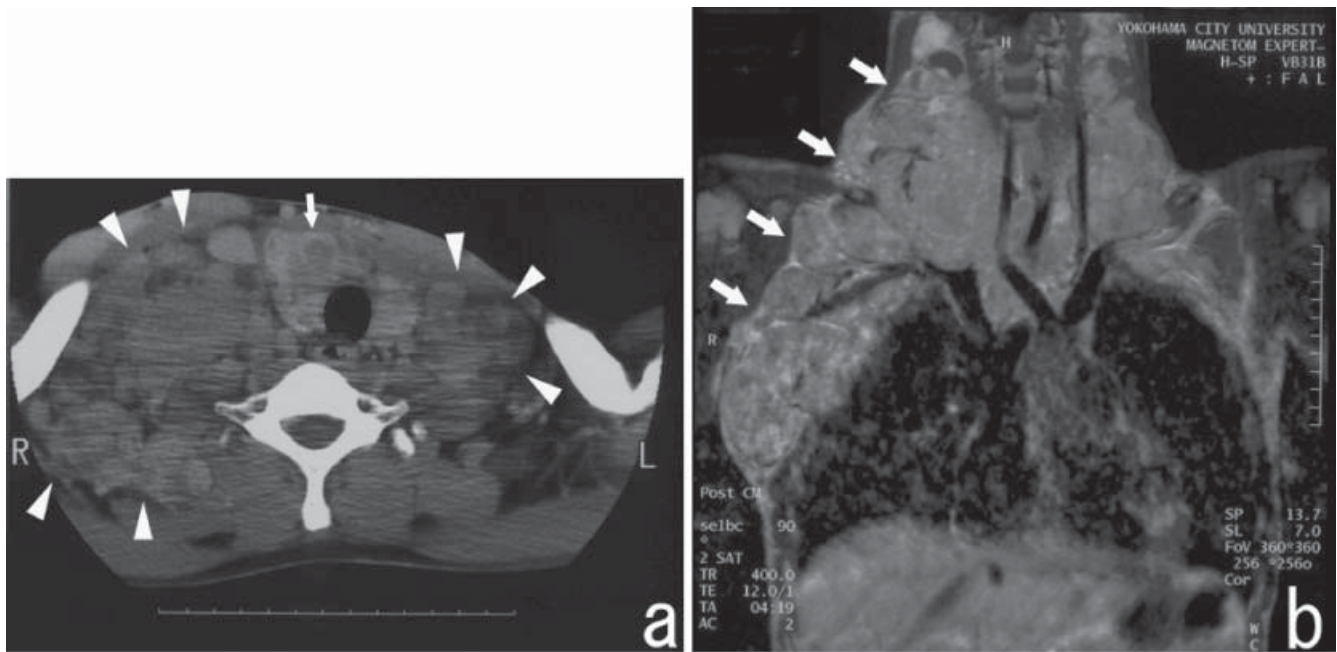


Fig. 1. **a** Computed tomography scan showing the primary thyroid tumor in the right lobe (*arrow*) and bilateral cervical and right supraclavicular lymphadenopathy (*triangles*). **b**

Magnetic resonance imaging showing bilateral cervical, right supraclavicular, and right axillary lymphadenopathy, contiguous from the neck to the right axilla (*arrows*)

stable (139 ng/ml) after the third course. At the time of this writing, the patient was alive with disease.

Discussion

Axillary LNM from thyroid carcinoma is rare. Our search of the English-language literature found only six previous reports, as summarized in Table 1. There were five men, including our patient, and four women. Their mean age was 48.2 years, being younger than expected. The primary cancers were PTC in five patients, medullary thyroid carcinoma in one, sclerosing mucopidermoid carcinoma with eosinophilia in one, mucopidermoid carcinoma in one, and mucin-producing poorly differentiated adenocarcinoma in one. There has been no report of axillary LNM from follicular thyroid carcinoma. Five patients had concurrent axillary LNM, and four had axillary LNM as recurrent disease. The period from initial diagnosis to the development of axillary lymph node recurrence ranged from 7 months to 41 years. In the six reports that specified tumor differentiation, all patients had poorly differentiated components, suggesting that axillary LNM may be associated with poorly differentiated thyroid carcinoma. Seven of the nine patients had synchronous or metachronous distant metastasis, and only one patient was reported to be alive without disease. Axillary LNM may thus be an indicator of systemic disease and a poor prognosis.

Radioactive iodine therapy is often used as adjuvant treatment for differentiated thyroid carcinoma.^{9,10} We did not give our patient RI therapy after the thyroidectomy because he had stage I disease with no apparent synchronous distant metastasis and the resection had been curative. However, lung metastases developed 6 years later. The other patients with axillary LNM^{3,5,8} had poor outcomes (Table 1). Considering the evidence that axillary LNM is a predictor of poor outcome in patients with thyroid carcinoma, we suggest that these patients require RI therapy as adjuvant treatment.

Our patient did not have any family history of thyroid disease or previous radiation exposure. We think that this case may be classified as pediatric thyroid carcinoma, considering the time of onset of the disease, although he was 21 years old at diagnosis. Moreover, pediatric patients tend to have a higher incidence of lymph node and lung metastases¹¹ and higher recurrence rates.^{12,13} These patients require comprehensive treatment strategies.¹⁴

Rouviere reported communication between the cervical and axillary lymphatics, but physiologic flow is centripetal to the jugulosubclavian junction.¹⁵ Consequently, mediastinal LNM sometimes occurs in PTC, but axillary LNM is rare. However, malignant tumors can alter and partially block lymphatic pathways, potentially resulting in axillary LNM. When sentinel nodes around the lymphatic terminus in the jugulosubclavian confluence are involved by carcinoma and their lymph-

phatic flow is blocked, disease spreads in a retrograde direction along the transverse cervical lymph nodes in the supraclavicular region. These retrograde pathways of lymphatic drainage can ultimately culminate in axillary LNM. Although altered lymphatic flow is mainly due to blockage of the lymph nodes by metastasis, fibrosis at the jugulosubclavian junction caused by surgical manipulation or radiotherapy can also result in anomalous lymphatic dissemination to the axilla.¹⁶⁻¹⁸

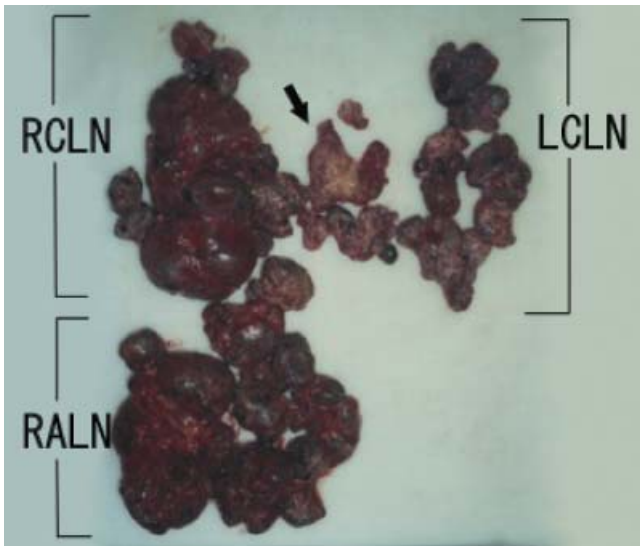


Fig. 2. The resected thyroid (*arrow*) and dissected gross mass, comprising bilateral cervical and right axillary lymphadenopathy. The largest lymph node metastasis was 9 cm in diameter. *RCLN*, right cervical lymph nodes; *LCLN*, left cervical lymph nodes; *RALN*, right axillary lymph nodes

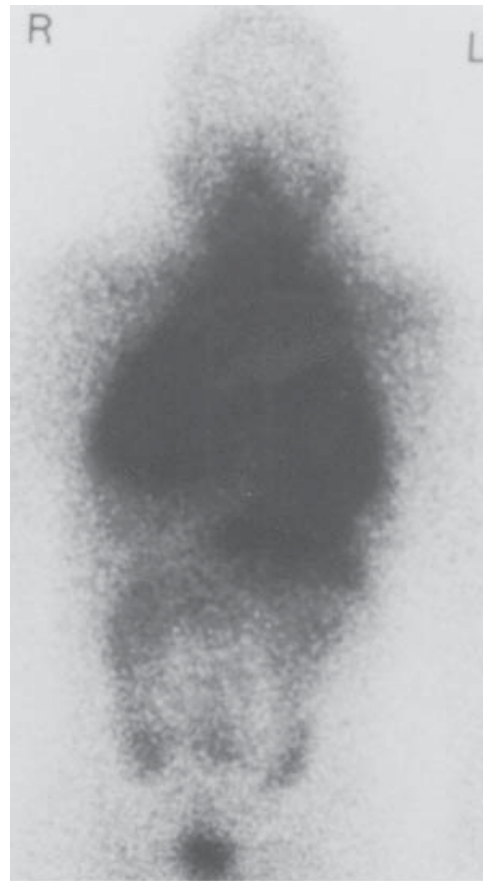


Fig. 4. The uptake of radioactive iodine in the recurrence 6 years later. Intensive uptake was seen in the disseminated lung metastases

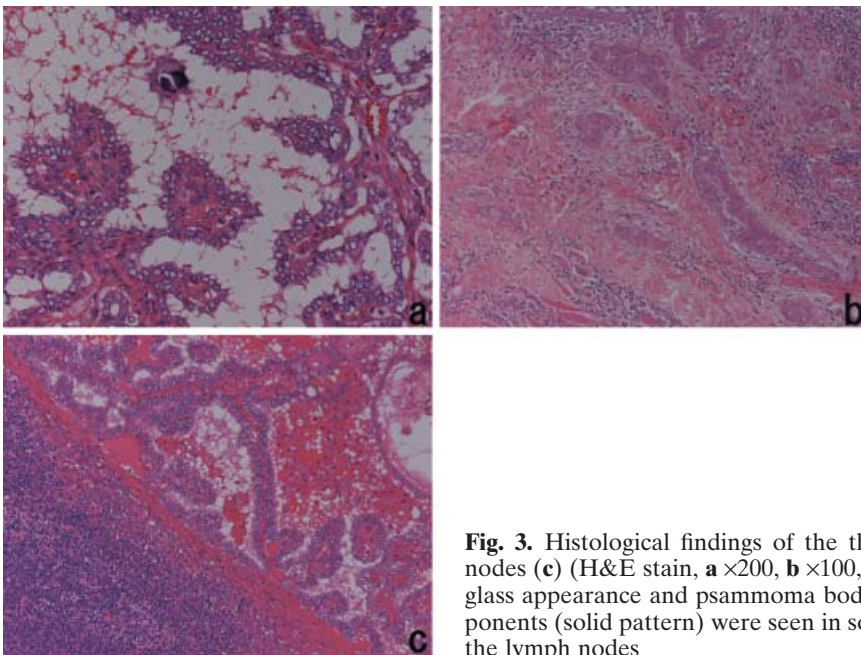


Fig. 3. Histological findings of the thyroid tumor (**a,b**) and right axillary lymph nodes (**c**) (H&E stain, **a** $\times 200$, **b** $\times 100$, **c** $\times 100$). **a** Papillary structures with a ground glass appearance and psammoma bodies were found. **b** Poorly differentiated components (solid pattern) were seen in some areas. **c** Papillary structures were seen in the lymph nodes

Table 1. Characteristics of the reported patients with axillary lymph node metastasis (LNM) from thyroid carcinoma

Case no.	First author ^{Ref.}	Age (years)	Sex	Histology	Differentiation	Appearance of axillary LNM	Adjuvant therapy	Distant metastasis	Outcome ^a
1	Koike ³	51	F	PTC	Partial poorly	Recurrence (5 years)	RI therapy	Multiple	Death (8)
2	Shehadeh ⁴	38	F	SMECE	NA	Concurrent	RI therapy, EBRT, chemotherapy	Lung	NA
3	Minagawa ⁵	52	M	MEC	NA	Concurrent	Chemotherapy	Lung and vertebra	Death (2)
4	Ueda ⁶	45	F	PTC	NA	Recurrence (7 years)	None	None	NA
5	Mizukami ⁷	58	M	MAC	Poorly	Recurrence (7 months)	RI therapy	None	Disease-free (10)
6	Lal ⁸	65	M	PTC	Poorly	Recurrence (41 years)	NA	Multiple	Death (1)
7	Lal ⁸	59	M	MTC	Poorly	Concurrent	NA	Multiple	AWD (6)
8	Lal ⁸	45	F	PTC	Poorly	Concurrent	NA	Multiple	Death (10)
9	Present case	21	M	PTC	Partial poorly	Concurrent	RI therapy	Lung	AWD

PTC, papillary thyroid carcinoma; SMECE, sclerosing mucoepidermoid carcinoma with eosinophilia; MEC, mucoepidermoid carcinoma; MAC, mucin-producing adenocarcinoma; MTC, medullary thyroid carcinoma; NA, not available; RI therapy, radioactive iodine therapy; EBRT, extra beam radiation therapy; AWD, alive with disease

^aDuration (months) after diagnosis of axillary LNM

This type of anomalous drainage may be responsible for axillary lymph node recurrence.

In summary, we reported a case of axillary LNM from PTC at initial presentation. Both the primary tumor and lymphadenopathy from the neck to axilla were resected curatively, but lung metastases developed 6 years later. Axillary LNM is rare and appears to indicate a poor prognosis. Thus, patients who have axillary LNM from PTC, including those with TNM stage I disease, require comprehensive treatment strategies.

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