CASE REPORT

Occult Papillary Thyroid Carcinoma Initially Presenting as Cervical Cystic Lymph Node Metastasis: Report of Two Cases

Yu-Chun Chang¹, Wu-Chia Lo¹, Cheng-Yu Lo², Li-Jen Liao¹*

¹Department of Otolaryngology, and ²Department of Anatomic Pathology, Far Eastern Memorial Hospital, Taipei, Taiwan

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Cervical cystic lymph node metastasis as the first and sole manifestation of occult papillary thyroid carcinoma (PTC) is uncommon, and can be mistaken for branchial cleft cyst. The present study reports two cases of PTC initially presenting as upper lateral neck cysts. Ultrasound examination confirmed the presence of occult papillary carcinoma with neck metastasis. The critical importance of ultrasound examination of the soft tissue of the neck for the identification of the clinical manifestations and the imaging features of occult PTC are discussed, with an emphasis on factors that may contribute to misdiagnosis.

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Introduction

Papillary thyroid carcinoma (PTC) is the most common thyroid cancer. Overall, PTC accounts for 80% of thyroid cancers and 21.5% of PTC cases have shown lymph node involvement [1,2].

Cervical lymph node metastasis as the first and sole manifestation of occult PTC is uncommon. A diagnosis of occult papillary thyroid carcinoma (OPTC) is given for cases of PTC in which the primary lesion of the cervical node metastasis is difficult to detect using palpation [3]. OPTC can be mistaken for a branchial cleft cyst. The general consensus among clinicians is that the primary lesion in PTC should be no more than 1.5 cm in length [4,5]. Studies of routine use of ultrasonography for diagnosis of OPTC have reported an incidence of 0.3% [3,6]. By contrast, papillary microcarcinoma is defined as <1.0 cm, and studies have reported an incidence of neck metastasis of 17.8% [7,8].

Previous case reports have described cervical cystic lymph node metastases associated with OPTC [9,10]. However, the ultrasound (US) features of these metastases have not been characterized in detail. Our study describes...
two cases in which a solitary lateral cystic mass in the neck was the initial symptom of PTC. The findings from our review of these cases indicate the need for awareness of the clinical manifestations and imaging features of OPTC when performing US examination of the soft tissue of the neck.

Case reports

Case 1

A 28-year-old woman who denied any previous systemic diseases presented with a progressively enlarging mass on the left upper neck for >1 year. Physical examination revealed a 2-cm, nontender, movable cystic mass in the upper jugular region but no other remarkable findings. No palpable thyroid mass was observed. A family history of head and neck cancer was denied, and the patient reported no previous contact with radiation. US was performed using a color Doppler US unit (Philips HDI 3500, Bothell, WA) and a 5–12-MHz broadband linear array transducer. A well-defined cystic mass with internal debris and thick irregular walls was observed (Fig. 1). A well-defined 0.5-cm thyroid cystic nodule without microcalcification was also observed (Fig. 2). US showed that the cystic lymph node was avascular (Fig. 3). Approximately 4 mL of brownish fluid was extracted from the cystic lymph node at the cystic and solid regions using US-guided fine-needle aspiration (FNA). Cytology revealed atypical cells with nuclear pleomorphisms and grooves (Figs. 4 and 5), but the number of cells was insufficient for diagnosis. Excisional biopsy of the cystic mass was performed, and the pathology revealed metastatic papillary carcinoma (Fig. 6). Thyroidectomy and left neck dissection were performed. Pathological analysis of the excised tissue indicated that a 7-mm papillary...
carcinoma was present in the left lobe of the thyroid, and two of the 11 lymph nodes showed tumor metastasis.

Case 2

A 49-year-old woman who was previously well presented with a mass in the left-upper cervical area of the neck for approximately 6 months. No palpable thyroid mass was identified. The patient’s history showed that the neck mass was initially identified 5 years previously. Palpation-guided aspiration was performed, resulting in a sustained reduction in mass size. Initial cytology was nondiagnostic, revealing numerous inflammatory cells. No radiation treatment was performed. A family history of head and neck cancer was denied. Branchial cleft cyst was suspected. US examination showed a 2.5-cm well-defined cystic mass with thick irregular walls (Fig. 7). A 1-cm ill-defined hypoechoic solid nodule with microcalcification was also observed over the left lobe of the thyroid gland (Fig. 8). US examination also showed spotted vascularity in the thyroid nodule. We sent specimens for cytology of neck cyst and thyroid nodule at the same time, including measurement of thyroglobulin level of the fluid of the neck cyst. US-guided FNA was performed. Cytology of the cystic fluid was nondiagnostic, but elevated thyroglobulin levels (120.0 ng/mL) were reported. Cytology of the thyroid nodule revealed papillary carcinoma (Fig. 9). Diagnosis of PTC was made, with neck metastasis suspected. Thyroidectomy and left neck dissection were performed. Pathological analysis of the excised tissue showed a 1-cm papillary carcinoma in the left lobe of the thyroid, and three of the 10 lymph nodes showed tumor metastasis.

Discussion

For differential diagnosis of neck masses and thyroid nodules, US examination is typically the imaging method of
choice. Sonographic features suggestive of metastatic lymph nodes include enlargement, irregular border, round shape, ill-defined contours, absence of an echogenic hilum, microcalcification, cystic areas within lymph nodes, and color Doppler abnormalities, such as hypervascularity [11,12]. Irregular margins, hypoechogenicity, intranodular vascular spots, and microcalcifications are characteristics of nonpalpable thyroid cancer [13]. A study showed no significant differences between nonpalpable PTC that were identified based on pathology results and PTC identified by ultrasonographic characteristics, such as echogenicity, margins, calcification, shape, and cystic change [14]. Liquefaction necrosis of the lymph node can result in cyst formation [6,15]. PTCs frequently undergo cystic transformation, both in the primary tumor and in the metastatic lymph node [9]. Cystic changes in cervical lymph nodes are, therefore, suggestive of metastatic PTC, and studies have reported an incidence between 6.7% and 13% [9,15]. Cystic lymph nodes with thickened outer walls, internal echoes, internal nodularity, and separations further indicate the presence of thyroid carcinoma [16].

Branchial cleft cysts and cervical lymph node metastases of thyroid cancer share the same location along the sternocleidomastoid muscle. Although color Doppler US can distinguish the hypervascularity of lymph node metastasis from avascular branchial cysts, diagnostic difficulty occurs in differentiating the cystic masses caused by branchiogenic cysts and metastatic tumors of the thyroid with complete cystic degeneration. Cytology provides one diagnostic solution. The cytological features of the branchial cleft cyst are neutrophils, debris, and mature squamous epithelial cells. By contrast, intranuclear cyttoplasmic inclusions, nuclear grooves, and colloid materials in the aspirate are characteristics of PTC [17]. Therefore, cystic neck masses should be confirmed by pathological analysis of cystic fluid obtained by US–FNA. Previous studies have reported a high false-negative rate (25–67%) for FNA cytological analysis of cystic cervical masses that were subsequently diagnosed as occult thyroid carcinoma [10,18]. Thus, negative results from FNA cytology should not be assumed to indicate a benign process. If US or cytology indicates metastasis, excisional biopsy of the neck mass is recommended, as was shown in Case 1 of our study. In Case 1, FNA of the thyroid nodule was not performed because the US characteristics of the nodule were hypoechogenic, had clear margins, and were without microcalcification. Malignancy was, therefore, not suspected at the thyroid nodule. However, the cytology of the cystic lymph node showed neoplastic cells with frequent nuclear grooves, and papillary carcinoma could not be excluded. Thus, excisional lymph node biopsy may represent a more efficient and expeditious means of detecting metastasis of nonpalpable PTC, compared with the initial evaluation by FNA cytology.

Thyroglobulin measurement can also facilitate the diagnosis of cervical lymph node metastasis in patients with PTC [19]. In Case 2 of our study, the cytology was non-diagnostic. However, the aspirated cystic fluid had an elevated thyroglobulin level. Studies have shown that the sensitivity of thyroglobulin measurements was approximately 84% [19]. Thus, thyroglobulin measurements of aspirated cystic fluid may represent an alternative means of diagnosis for cystic neck masses with suspected malignancy (normal range of serum thyroglobulin is 1.40–29.2 ng/mL in men and 1.50–38.5 ng/mL in women) [20].

Identification of the primary lesion is another key factor in PTC diagnosis. However, some cases may go undetected, despite modern imaging modalities and high-resolution US, because of difficulty visualizing small lesions or benign ultrasonographic appearance. When evaluating cystic lesions in the neck, physicians should seek to exclude occult papillary carcinoma using the most reliable methods available, including a review of the ultrasonographic

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**Table 1** Potential sonographic features in differential diagnosis of common cystic neck mass.

<table>
<thead>
<tr>
<th>Diseases</th>
<th>Echogenicity</th>
<th>Sonographic features</th>
<th>Doppler</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metastasis of PTC</td>
<td>Hyperechoic</td>
<td>Ill-defined</td>
<td>Punctate</td>
<td>Hypervascular</td>
</tr>
<tr>
<td>Branchial cleft cyst</td>
<td>Hypoechoic</td>
<td>Well-defined</td>
<td>Absent</td>
<td>Avascular</td>
</tr>
<tr>
<td>Thyroglossal duct cyst</td>
<td>Hypoechoic</td>
<td>Well-defined</td>
<td>Absent</td>
<td>Avascular</td>
</tr>
</tbody>
</table>

PTC = papillary thyroid carcinoma.
characteristics associated with cystic lymph node metastasis such as irregular margins, hypoechogenicity, and cystic changes, which were also observed in our study [9]. During neck sonographic examination, cystic lesions are not uncommon. For differential diagnosis of other cystic lesions, potential sonographic features [21,22] compared to metastatic papillary carcinoma are summarized in Table 1. Correct preoperative diagnosis is essential prior to conservative or aggressive surgery. Cystically apparent metastasis of thyroid carcinoma usually shows a significantly high growth rate and aggressive characteristics. Once a diagnosis of thyroid cancer has been established, modified neck dissection and total thyroidectomy followed by radioactive iodine therapy offer a favorable prognosis.

In our hospital, all cases of enlarged lymph nodes receive US examination after initial physical examination of the head and neck. If malignancy is suspected, US-guided FNA is performed immediately. The thyroid gland is also routinely checked. This method is simple, quick, and inexpensive compared to CT or magnetic resonance imaging. Although OPTC is relatively uncommon, physicians must consider the possibility of its presence when evaluating a suspected cervical node metastasis.

References