中文題目：甲狀腺乳突癌淋巴結轉移之超音波影像、細針穿刺細胞學和淋巴甲狀腺球蛋白定量之分析比較

英文題目：Diagnostic Comparison of Sonographic Characteristics, Fine Needle Aspiration Cytology and Lymph Node Washout of Thyroglobulin in Papillary Thyroid Carcinoma with Lymph Node Metastasis

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Introduction: Papillary thyroid carcinoma (PTC) prognosis is good after appropriate management with disease-free status. But lymph node metastasis of the neck has been reported in around 20-50%, or up to 90% micro-metastasis. The presence of lymph node metastasis indicates structural evidence of disease and disease persistence. The median 10-year survival rate will then drop to 60% during follow-up in such patients. Therefore, it is critical to diagnose the loco-regional lymph node metastases earlier for further intensive treatment. Image studies are routinely used and exhibit various sensitivities. Particularly, ultrasound guided aspiration cytology is highly skill- and experience-dependent, which is a limitation in clinical practice. However, fine needle aspirate for quantitative measurement of thyroglobulin of the neck lymph nodes, established by Pacini et al. in 1992, was demonstrated to reach ideal sensitivity and specificity to diagnosis lymph node metastasis.

Normal lymph nodes are widely distributed over the neck compartments (I~VI). In general, the echogenicity, margin, shape, vascularity, presence of inner hyperechoic solid content or calcification of the lymph nodes are used to differentiate the benign reactive or suspicious malignant lymph nodes by ultrasound. The clinical features of neck lymph nodes may also vary in different compartments at the same time, so how to choose a proper lymph node within neck compartments to diagnose the metastases

still remains a challenge for clinicians.

To address this critical problem in clinical practice, we designed this study based on a retrospective data set from PTC patients with recurrent lymph node metastases during follow-up. We tested the accuracy of ultrasound-guided fine needle aspiration cytology and lymph node fine needle aspiration thyroglobulin measurement (LN-FNA-Tg) validated by excision pathology to diagnose nodal metastases. Then, we tried to assess the hazard of the suspicious ultrasound features of cervical lymph nodes with LN-FNA-Tg, which could assist clinician to determine the proper lymph node to improve diagnostic rate.

Materials and Methods: From October 2011 to September 2014, 156 PTC patients were detected to have suspicious malignant nodal metastases based on the sonographic characteristics of cystic content in lymph node, absent of hilum, peripheral hypervascularity, calcification over lymph node, hyperechoic content in lymph node, and Solbiati index (SI, maximal long/short axis) < 2. To avoid bias from serum thyroglobulin, fourteen patients were excluded from this study because of previous partial thyroidectomy. A total of 236 suspicious lymph nodes from 148 patients (43 males and 105 females) were further evaluated by ultrasound-guided fine needle aspiration cytology and thyroglobulin assay with residual specimen. Logistic regression analysis was applied to test risk impact of the sonographic characteristics on LN-FNA-Tg based on significance in univariate and multivariate models.

Results: A total of 49 lymph node aspirates from 34 patients had elevated LN-FNA-Tg or positive cytology result, and were then histologically proved as nodal metastasis by lymph node dissection. The single suspicious malignant sonographic features only achieved an accuracy rate ranging from 59.8 to 77.6% to detect nodal

metastasis. The sensitivity of ultrasound-guided fine needle aspiration cytology was 65.3%, which was similar to high-resolution ultrasound. The sensitivity of LN-FNA-Tg was 77.5%. There were 11 lymph nodes from 9 patients that showed positive cytology but negative LN-FNA-Tg during follow-up. Five of these were in the advanced cancer stage (4c) with negative serum thyroglobulin but positive distant metastases detected by positron emission tomography. De-differentiated status may contribute to the negative thyroglobulin in serum and nodal metastasis. Besides, absent of hilum and hyperechoic content were most prevalent to be detected in pathologic proved malignant lymph nodes. And sonographic features of the lymph nodes to signify positive LN-FNA-Tg were cystic content, hyperechoic content and absent of hilum in sequence.

Conclusion: Ultrasound guided LN-FNA-Tg is a good modality to diagnose lymph node metastasis. The reliable malignant sonographic features to choose for LN-FNA-Tg were cystic content, hyperechoic content and absent of hilum in lymph nodes. De-differentiated tumor may contribute to negative thyroglobulin expression in serum and lymph nodes. LN-FNA-Tg and fine needle aspiration cytology play complementary role to diagnose papillary thyroid carcinoma with nodal metastasis.