



# Metastatic lymph node characteristics predicting prognosis of papillary thyroid cancer patients

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Metastases to cervical lymph nodes (LNs) in patients with papillary thyroid cancer (PTC) are common and associated with up to 80% of PTC patients (1). Cervical LN metastasis itself has been known as a risk factor for recurrent/persistent disease and PTC with lateral cervical LN metastasis has a worse prognosis than that with central neck LN metastasis (2,3). Recent studies suggested that other various metastatic LN characteristics, such as the number, size, and the presence of extranodal extension of metastatic LNs, are also prognostic (4,5).

While PTC patients with cervical LN metastases were classified as having intermediate risk in the previous 2009 American Thyroid Association (ATA) risk stratification system, the risk of structural recurrent/persistent disease varies according to the number or size of metastatic LNs. For example, patients with  $\leq 5$  metastatic LNs or all involved LNs  $< 0.2$  cm has only 4–5% of risk but, patients with  $> 5$  metastatic LN or clinically evident macroscopic metastatic LNs has about 20% of risk of structural recurrent/persistent disease in PTC (1). As a result, recent revised ATA risk stratification system classified PTC patients with  $\leq 5$  N1 micrometastases ( $< 0.2$  cm in largest dimension) as ATA low risk, whereas pathologic N1 with  $\geq 3$  cm in largest dimension or extranodal extension as ATA high risk (2).

Metastatic LN ratio, defined as the number of metastatic LNs divided by the number of dissected LNs, represent the extent of LN involvement and completeness of LN dissection and also seems to be predictive of structural recurrent/persistent disease of PTC (6). Because the

number of metastatic LNs and the metastatic LN ratio are closely related, it is uncertain which of them has a more value for predicting prognosis of PTC patients.

One recent study by Gao *et al.* (7) is nicely compared the prognostic value of metastatic LN ratio with the number of metastatic LNs. Interestingly, the metastatic LN ratio was more predictive of excellent response to initial therapy in patients with  $\leq 10$  dissected LNs, while the number of metastatic LNs was more predictive in patients with  $> 10$  dissected LNs. Their result suggests that metastatic LN ratio might be a more appropriate prognostic factor in case of inadequate LN dissection. However, appropriate cutoff point of metastatic LN ratio is not well established in this study and further confirmation studies are needed. In case of complete LN dissection, the number of metastatic LNs presents the actual extent of LN metastasis and might be more informative.

Recent evidences suggested that various metastatic LNs characteristics are predictive of recurrent/persistent disease in PTC and should be carefully evaluated and described in the pathology report. However, the impact of these various metastatic LNs characteristics on survival of PTC patients is less well developed. Recently revised 8th American Joint Committee on Cancer Tumor Node Metastasis staging system only classified N1 disease from N0 disease. N1 disease is classified as stage I in patients  $< 55$  years old at diagnosis and reclassified as stage II in older patients. Small-volume LN metastasis might have little impact on the risk of disease-specific survival but, no studies have adequately evaluated the impact of size, number or ratio of metastatic

LN on survival (8).

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