

News Release

Title

Neutrophil-to-lymphocyte ratio as a predictor of lymph node metastasis in extramammary Paget's disease

Key Points

- **Extramammary Paget's disease (EMPD) is a malignant tumor that is mainly seen in the elderly and has a poor prognosis when lymph node metastasis occurs.**
- **Sentinel lymph node biopsy has been covered by the health insurance system in Japan since 2020.**
- **The study shows that a neutrophil-to-lymphocyte ratio (NLR) of higher than 3 in a preoperative blood test is significantly associated with sentinel lymph node metastasis.**
- **It also suggests that NLR might be a significant predictor for lymph node metastasis in EMPD patients, providing us with a clue for determining which of them could benefit most from sentinel lymph node biopsy.**

Summary

Prof. Masashi Akiyama, Dr. Tomoki Taki, Dr. Shoichiro Mori and Dr. Aoi Ebata of the Department of Dermatology, Nagoya University Graduate School of Medicine have found that a high neutrophil-to-lymphocyte ratio (NLR) might be predictive of lymph node metastasis in extramammary Paget's disease (EMPD).

EMPD is a rare adenocarcinoma of apocrine sweat gland origin that occurs in the vulva, perianal region, scrotum, penis, or axilla. EMPD limited to the epidermis is not life-threatening. However, invasive EMPD is associated with a poor prognosis. Some studies have shown that metastasis to one or more lymph nodes is associated with a poor prognosis. It is critical to detect lymph node metastasis at an early stage and to prevent further tumor development.

In the study, 137 EMPD patients underwent sentinel lymph node biopsy at Nagoya University Hospital from March 2003 to March 2020. A NLR of higher than 3 in the preoperative blood test was found to be significantly associated with sentinel lymph node metastasis. We propose that NLR might be a significant predictor for lymph node metastasis in EMPD patients, providing us a clue for determining which of them could most benefit from sentinel lymph node biopsy.

Research Background

EMPD is a rare adenocarcinoma of apocrine sweat gland origin that occurs in the vulva, perianal region, scrotum, penis, or axilla. EMPD limited to the epidermis is not life-threatening.

However, invasive EMPD is associated with a poor prognosis. Some studies have revealed that metastasis to one or more lymph nodes is associated with a poor prognosis. Thus, it is critical to detect lymph node metastasis at an early stage and to prevent further tumor development. Therefore, biomarkers that predict the risk of lymph node metastasis are required, although few studies have evaluated the usefulness of multiple biomarkers. An elevated NLR in peripheral blood samples is often regarded as a strong predictor for overall survival and disease-free survival in many malignant tumors. The present retrospective study evaluated the potential of an elevated NLR in peripheral blood as a biomarker for the risk of lymph node metastasis in EMPD.

Research Results

The study involved 137 EMPD patients who underwent sentinel lymph node biopsy at our hospital from March 2003 to March 2020. Statistical tests (χ^2 test, Mann–Whitney U test, logistic regression analysis, Kruskal–Wallis test) were used to identify correlations between clinical features/laboratory findings and elevated NLR or sentinel lymph node biopsy positivity. Receiver–operator curves were constructed using the DeLong model to define the optimal NLR cutoff value. That value was defined as 3.0. The high-NLR group had 30 patients whose NLRs exceeded 3 ($\text{NLR}>3$), and 23% of those 30 patients showed sentinel lymph node metastasis. The low-NLR group had 107 patients whose NLRs were no more than 3 ($\text{NLR}\leq 3$), and 8% of those 107 patients had sentinel lymph node metastasis. Then, the patients were classified into two groups by sentinel lymph node biopsy results. 16 of the 137 patients (11.7%) showed sentinel lymph node metastasis. The rate of such metastasis was significantly higher in the high-NLR group than in the low-NLR group (χ^2 test, p -value=0.0245). The odds ratio of such metastasis for patients with $\text{NLR}>3$ was 3.311 (95% CI 1.117 to 9.804, p -value=0.0380) compared to patients with $\text{NLR}\leq 3$. In a logistic regression analysis of five variables (age, male gender, EMPD invasion depth, perianal vs non-perianal location, NLR) in 137 patients for sentinel lymph node biopsy positivity, only NLR was found to be significantly associated with sentinel lymph node biopsy positivity.

Research Summary and Future Perspectives

The present study reports that NLR might be a significant predictor for lymph node metastasis in EMPD patients, providing us with a clue for determining which of them could most benefit from sentinel lymph node biopsy. The conclusion should be validated by prospective studies involving a larger number of patients. Further investigations are required to explore the impact of NLR on disease-free survival, progression-free survival, overall survival, and even response to therapy.

Publication

Neutrophil-to-lymphocyte ratio as a predictor of lymph node metastasis in extramammary Paget's disease: A retrospective study

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