**Lymph node morphology and radioactivity as a prediction value of positive sentinel lymph node and involvement of non-sentinel lymph nodes following axillary lymph node dissection**

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## Abstract

**Background:** Prediction of non-sentinel lymph node cancer metastasis is an interesting area of research now due to the current era of trying to avoid the axillary node clearance. Around 60% of the patients who have axillary node clearance (ANC) have no extra positive lymph nodes.

**Purpose:** This study aimed to identify the predictors of positive sentinel lymph node biopsy (SLNB) in patients with clinically node-negative breast cancer and foretell the positive non-sentinel lymph node.

**Materials and methods:** A single institution retrospective analysis of 412 female patients underwent axillary SLNB and further ANC between 2018 and 2021 in a UK University teaching hospital, breast department. Lymph node (LN) weight, volume and radioactivity have been evaluated in three groups which are, macrometastasis, micrometastasis, and negative lymph node. The correlation also included the tumour grade and size.

**Results:** The total dissected LNs were 563. Of these 451 were negative, 42 micrometastasis and 70 macrometastasis. Median pathology tumour gross size showed significance (*p* = 0.005) for the macrometastasis group in comparison to the negative or micrometastasis groups (26.5 mm, 21. mm and 15 mm). The macrometastatic LNs were less active than the negative and the micrometastatic with significance (201, 507.5 and 254, *p* = 0.035). The weight of the macrometastatic LNs were more than the negative and the micrometastatic LNs with significance (0.57, 0.43 and 0.47, p = 0.06). Also the median volume was significant between the macrometastasis, negative and the micrometastasis (808, 315 and 471, p = 0.021). Positive LNs that showed extra positive LNs after ANC was significant in comparison to the positive LNs which did not show extra positive LNs after ANC in terms of median tumour size, ratio of primary site activity to the LN activity, LN weight and volume (*p* = 0.023, 0.001, 0.024 and 0.001)

**Conclusion:** Our result suggests that the LN morphology and radioactivity can predict the SLN and the non-SLN positivity.