Validity of the Novel Taiwan Lymphoscintigraphy Staging and Correlation of Cheng Lymphedema Grading for Unilateral Extremity Lymphedema

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Objective: The aim was to validate the new Taiwan Lymphoscintigraphy Staging, correlate it with Cheng Lymphedema Grading (CLG) and evaluate the treatment outcomes of unilateral extremity lymphedema.

Background: No consensus has been reached for diagnosis and staging for patients with lymphedema among medical specialties.

Methods: We included 285 patients with unilateral extremity lymphedema using lymphoscintigraphy. Lymphoscintigraphy was correlated to clinical symptoms and signs, and classified into normal lymphatic drainage, partial obstruction, and total obstruction. Inter- and intraobserver reliability of Taiwan Lymphoscintigraphy Staging, correlation between Taiwan Lymphoscintigraphy Staging and clinical findings were conducted. Patients were categorized in “surgical” (n = 154) or “nonsurgical” (n = 131) groups for outcome evaluation.

Results: Lymphoscintigraphy found 11 patients (3.9%) with normal lymphatic drainage, 128 (44.9%) with partial obstruction, and 146 (51.2%) with total obstruction. Taiwan Lymphoscintigraphy Staging showed high interobserver agreement [intraclass correlation coefficient: 0.89 (95% confidence interval, 0.82–0.94)], and significantly correlated to computed tomography volumetric difference (r = 0.66, P < 0.001) and CLG [intraclass correlation coefficient: 0.79 (95% confidence interval 0.72–0.84)]. At a mean follow-up of 31.2 ± 2.9 months, significant improvement in the circumferential difference (from 23.9% ± 17.6% to 14.6% ± 11.1%; P = 0.03) with a mean circumferential reduction rate of 40.4% ± 4.5% was found in surgical group. At a mean follow-up of 26.6 ± 8.7 months, the nonsurgical group had increase of mean circumferential difference from 24.0% ± 17.2% to 25.3% ± 19.0% (P = 0.09), with a mean circumferential reduction rate was −1.9% ± 13.0%.

Conclusions: The Taiwan Lymphoscintigraphy Staging is a reliable diagnostic tool, correlated with clinical findings and CLG, aiding in the selection of the appropriate treatment to achieve favorable long-term outcomes in unilateral extremity lymphedema.

Keywords: breast cancer–related lymphedema, extremity lymphedema, lymphatic microsurgery, lymphedema diagnosis, Cheng Lymphedema Grading System, lymphoscintigraphy