The Pittsburgh Trunk Lymphedema Staging System:
A validated staging system for the description of breast cancer-associated trunk lymphedema

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Background

Multiple assessment and staging systems have been developed for upper extremity lymphedema, often associated with breast cancer surgery.

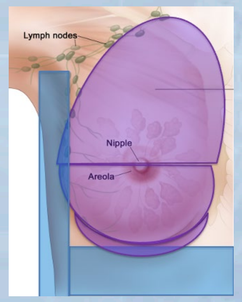
However, there is little published that describes lymphedema in extra brachial sites, such as the trunk or breast.

Aims

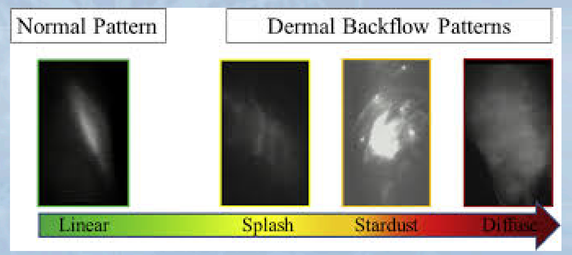
1) Define the presence of lymphedema in the trunk using ICG lymphangiography
2) Develop a staging system to describe severity of disease

Methods

- Each hemi-trunk was divided into five anatomic regions.
- Each anatomic area was classified by Koshima's dermal backflow pattern by **two independent, blinded reviewers**.
- Each anatomic region was assigned a linear score based on dermal backflow pattern in that region.
- Values for each region were summed to calculate a total score for each hemi-trunk.



Hemi-trunk Anatomic Regions

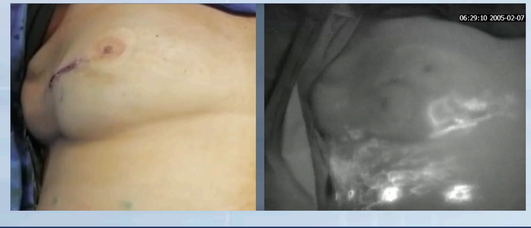


Regional scoring model

Results

The Pittsburgh Trunk Lymphedema Staging System

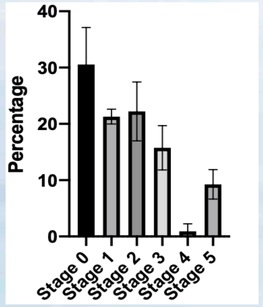
Summed Regional Scores	Stage Assigned
0	0
1-3	1
4-6	2
7-9	3
10-12	4
13-15 / no migration	5



29 patients (52 sides) underwent ICG lymphangiography of trunk.

A total of 35 sides (76%) of the cohort had some form of ICG-evidenced lymphedema.

Each stage of the staging system was seen in our patient population.



Staging System Validation

	Cohen's Kappa	Interpretation (Agreement)
Dermal backflow score for each defined breast/chest area	0.4117	Moderate
Stage assessment	0.8109	Near perfect
Intra-observer agreement (duplicated patient)	1.0000	Perfect

To assess inter-observer variation, A linear-weighted Cohen's Kappa statistic indicated moderate agreement between reviewers.

A Kappa statistic was calculated to compare the **stage assignment of each patient** between both reviewers and was found to show near-perfect agreement.

To assess intra-observer variation, individual territory analysis and the summative stage scoring was compared for a duplicated patient. Reviewers rated all areas of the duplicated patient identically in their two assessments.

Conclusions

- There is ***anatomic and functional evidence*** of lymphatic dysfunction of the trunk following breast cancer surgery.
- The Pittsburgh Trunk Lymphedema Staging System is a ***validated scale*** for categorizing trunk and breast lymphedema.
- Plastic Surgeons should include examination and staging of trunk lymphedema in workup of patients following breast cancer surgery.

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