

Incidence of Lymphedema in Inflammatory Breast Cancer Patients Following Trimodality Therapy

Shelby Irwin BS¹, Mediget Teshome, M.D., M.P.H., F.A.C.S.¹

¹Department of Breast Surgical Oncology, The University of Texas MD Anderson Cancer Center, Houston, TX

Background

Lymphedema as a sequelae of breast cancer treatment is thought to affect between 13-42% of patients, making it a major concern for both patients and physicians.^{1,2} As oncologic survivorship and lifespan expectancies improve, understanding and management of this potential side effect becomes increasingly important.³

Inflammatory breast cancer (IBC) is an aggressive disease that comprises 1-5% of invasive breast cancer diagnoses.⁴ The standard of care consists of trimodality treatment—neoadjuvant chemotherapy (NCT), modified radical mastectomy (MRM), and radiotherapy (XRT). As both MRM and XRT are considered risk factors for lymphedema development, IBC patients are at an increased risk for lymphedema.

Objective

The objective of this study was to evaluate the incidence of lymphedema in IBC patients.

Methods

Patients with stage III and stage IV IBC treated at MD Anderson Cancer Center between 2016-2019 were identified from a prospective database (N=173). Lymphedema measurements captured in the medical record were reviewed. Patients were excluded if there were no lymphedema measurements available or they underwent bilateral axillary surgery (N=85).

Lymphedema was defined as a >10% increase in perometer readings in upper extremity volumes comparing the baseline measurement to the highest reported volume. Patients with preoperative and follow up lymphedema measurements were included in the analysis, with a final sample size of 84 patients. Demographic, clinical and pathologic factors, oncologic outcomes, lymphedema symptoms and objective lymphedema measurements were recorded for the entire cohort and compared among patients who did and did not develop lymphedema.

Table 1. Demographic, clinical-pathologic factors, outcomes and lymphedema assessment for IBC patients receiving preoperative and at least one follow up lymphedema volume measurement from 2016-2019 (N=84).

	Entire cohort N=84	Lymphedema N= 40 (47.6%)	No lymphedema N= 44 (52.4%)
Age	49 (range 25-81)	48 (range 32-69)	49 (25-81)
Race/ethnicity:			
Asian	3 (3.6%)	1 (2.5%)	2 (4.5%)
Black	5 (6.0%)	2 (5%)	3 (6.8%)
Native American	1 (1.2%)	0	1 (2.3%)
Hispanic	1 (1.2%)	1 (2.5%)	0
White	74 (88%)	36 (90%)	38 (86.4%)
BMI:			
<18.5	0	0	0
18.5-24.9	13 (15.5%)	5 (12.5%)	8 (18.2%)
25.0-29.9	26 (30.9%)	15 (37.5%)	11 (25%)
30.0-34.9	25 (29.8%)	12 (30%)	13 (29.5%)
>35	20 (23.8%)	8 (20%)	12 (27.3%)
Stage:			
III	65 (77.4%)	34 (85%)	31 (70.5%)
IV	19 (22.6%)	6 (15%)	13 (29.5%)
Subtype:			
HR+/HER2-	34 (40.5%)	16 (40%)	18 (40.9%)
HR+/HER2+	13 (15.5%)	5 (12.5%)	8 (18.2%)
HR-/HER2+	17 (20.2%)	12 (30%)	5 (11.4%)
HR-/HER2-	20 (23.8%)	7 (17.5%)	13 (29.5%)
Number of lymph nodes excised in ALND:			
<9	8 (11.9%)	3 (7.5%)	7 (15.9%)
>10	71 (84.5%)	37 (92.5%)	34 (77.3%)
Unknown	3 (3.6%)	0	3 (6.8%)
Laterality:			
Right	47 (56%)	24 (60%)	23 (52%)
Left	37 (44%)	16 (40%)	21 (48%)
Adjuvant radiation:			
Yes	79 (94%)	38 (95%)	41 (93.2%)
No	2 (2.4%)	2 (5%)	0
Unknown	3 (3.6%)	0	3 (6.8%)
Dominant Arm Affected:			
Yes	44 (52.4%)	22 (55%)	22 (50%)
No	38 (45.2%)	17 (42.5%)	21 (47.7%)
Unknown	2 (2.4%)	1 (2.5%)	1 (2.8%)
Average % Volume change of affected arm	12.2%	26.6%	-0.30%
Symptoms:			
Heavy	53 (63.1%)	34 (85.0%)	19 (43.2%)
Swollen	63 (75.0%)	40 (100.0%)	23 (52.3%)
Median follow up	18 (1-136)	23 (5-48)	9 (1-136)
Recurrence:			
Local-regional	2 (2.3%)	1 (2.5%)	1 (2.2%)
Distant	25 (29.8%)	14 (35%)	11 (25%)
Both	3 (3.6%)	2 (5%)	1 (2.2%)
Death:			
Yes	14 (16.7%)	4 (10%)	10 (22.7%)
No	70 (83.3%)	36 (90%)	34 (77.3%)

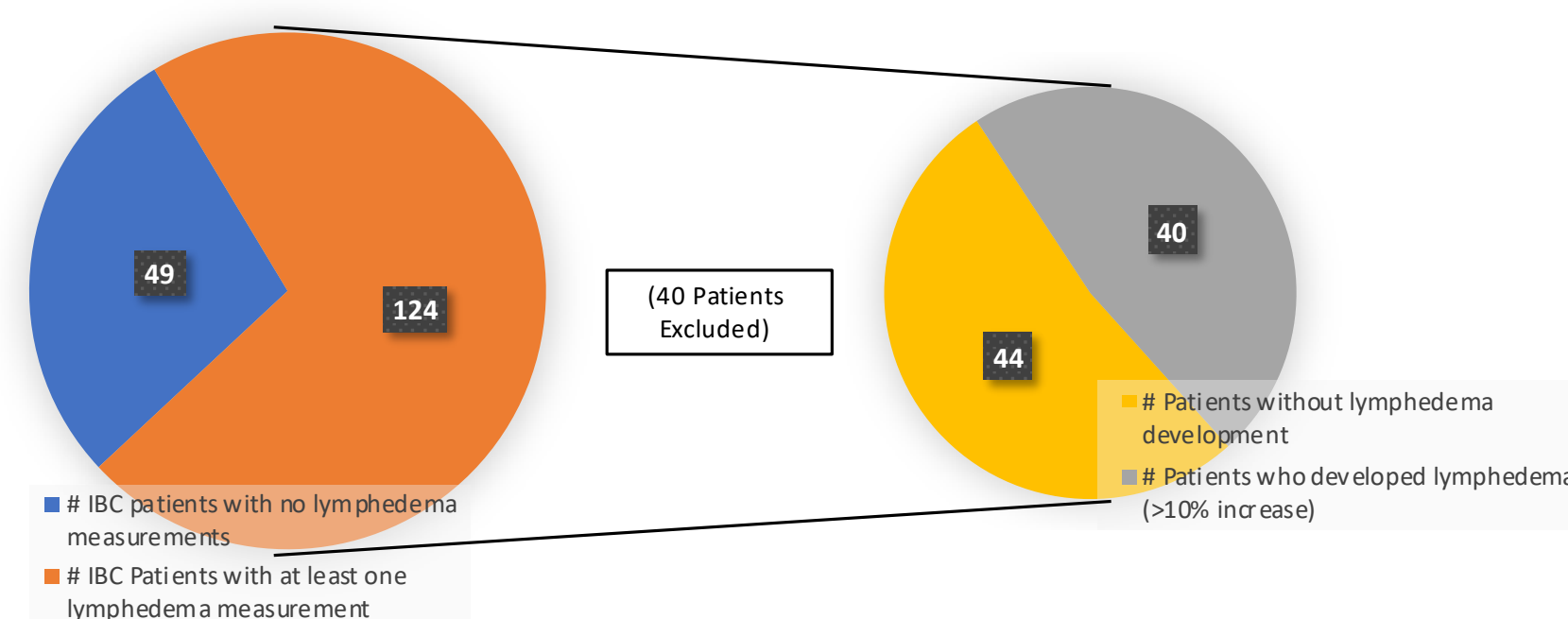


Figure 1. Summary of lymphedema measurements in IBC patients 2016-2019.



Figure 2. Clinical signs of IBC in a patient's left breast, including edema, skin thickening, peau d'orange, and erythema. Published by Simons et al.⁴

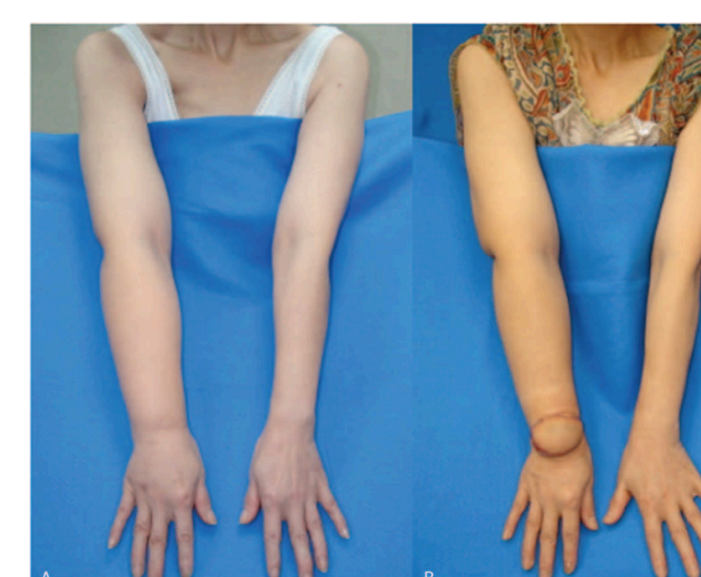


Figure 3. Clinical signs of lymphedema in a patient following mastectomy, ALND, and radiotherapy. Published by Engel et al.⁵

Results

- The incidence of lymphedema in this IBC cohort was 47.6%
- Average volume increase in patients who developed lymphedema was 26.6%
- Subjective reports of lymphedema were almost universal in patients who developed lymphedema (85% heaviness and 100% swelling) compared to lower values in patients with no lymphedema (43.2% heaviness and 52.3% swelling)
- Similar age and BMI among patients who did and did not develop lymphedema

Conclusions

Preliminary results suggest a uniquely high incidence of lymphedema in IBC patients, especially in subjective ratings of lymphedema development. Given this strong likelihood of lymphedema development, lymphedema management strategies should be explored for IBC patients.

Future Directions

- Determine time to lymphedema development in this population
- Further analysis to understand factors associated with lymphedema
- Explore how subjective assessment of lymphedema correlates to perometry measurements
- Evaluate lymphedema management strategies (e.g., physical therapy, lymphovenous bypass, lymph node transfer) and impact on % volume increase and time to lymphedema development

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