Impact of Early vs Delayed Referral to Physical Therapy and Occupational Therapy After Mastectomy and the Risk of Postmastectomy Lymphedema: A Real-World Propensity-Matched Study

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Abstract

Postmastectomy lymphedema is a common complication in breast cancer survivors. In a retrospective cohort study of over 24,000 patients, early physical and occupational therapy (within 14 days post-mastectomy) was associated with a significantly lower two-year lymphedema risk. Sentinel lymph node biopsy also showed reduced risk, while axillary lymph node dissection increased it.

Introduction

- Postmastectomy lymphedema is a chronic and often debilitating condition that affects breast cancer survivors. It results from the disruption or removal of lymphatic pathways during surgical treatment—particularly axillary lymph node dissection or radiation therapy—leading to fluid accumulation, swelling, discomfort, and functional limitations in the affected arm.
- To mitigate these outcomes, physical therapy (PT) and occupational therapy (OT) are widely recognized as cornerstone interventions. These therapies focus on early education, manual lymphatic drainage, compression therapy, exercise, and strategies to preserve upper limb function.
- However, despite their established role in lymphedema management, the **optimal timing for initiating PT and OT referrals** remains a subject of ongoing debate.
- **This study aims to address this clinical uncertainty by evaluating whether early referral to PT and OT following mastectomy is associated with a reduced incidence of lymphedema within two years post-surgery.**

Methods and Materials

- We conducted a retrospective cohort study using the TriNetX Global Collaborative Network, which includes de-identified electronic health records from 151 healthcare organizations worldwide.
- We identified adult women (≥18 years) with a diagnosis of breast cancer (ICD-10: C50) who underwent mastectomy between January 1, 2000, and December 31, 2020.
- Patients with pre-existing lymphedema or hereditary lymphedema were excluded. Two cohorts were defined based on the timing of PT and OT initiation relative to the mastectomy date.
- **Early cohort:** PT/OT initiated within 14 days post-mastectomy (n = 5,197).
- **Delayed cohort:** PT/OT initiated >14 days post-mastectomy (n = 18,817).
- PT/OT procedures were identified using relevant CPT codes for therapy evaluations, manual lymphatic drainage, gait training, and self-care training.
- A Cox proportional hazards model was used to assess the association between timing of PT/OT and lymphedema risk, adjusting for age, extent of breast resection, axillary dissection, and sentinel lymph node biopsy.
- **The primary outcome was the incidence of lymphedema occurring between 90 and 1095 days following the index event**

Results

Covariate	Hazard Ratio (HR)	95% Confidence Interval	p-value
Early vs. Delayed PT/OT	0.737	(0.608 – 0.893)	0.002
Age (per year)	0.981	(0.976 – 0.986)	<0.001
Right Breast Resection (0HTT0ZZ)	0.915	(0.680 – 1.232)	0.558
Left Breast Resection (0HTU0ZZ)	0.862	(0.639 – 1.162)	0.330
Bilateral Breast Resection (0HTV0ZZ)	0.597	(0.466 – 0.764)	<0.001
Right Axillary Dissection (07T50ZZ)	2.217	(1.386 – 3.549)	0.001
Left Axillary Dissection (07T60ZZ)	2.101	(1.308 – 3.375)	0.002
Sentinel Node Biopsy (38500)	0.721	(0.546 – 0.953)	0.021

Discussion

- In the multivariable Cox model, **early initiation** of PT/OT within 14 days post-mastectomy was **significantly associated** with reduced lymphedema risk (HR 0.737, 95% CI 0.608–0.893, p=0.002).
- **Sentinel lymph node biopsy** was associated with a **protective effect** (HR 0.721, 95% CI 0.546–0.953, p=0.021).
- In contrast, **axillary lymph node dissection** was associated with **more than a twofold increased risk of lymphedema** (right: HR 2.217, p=0.001; left: HR 2.101, p=0.002).
- **Bilateral mastectomy** was also **protective** (HR 0.597, p<0.001), and increasing age was modestly protective (HR 0.981 per year, p<0.001)
- Unilateral breast resections were not significantly associated with lymphedema risk.

Conclusions

- Early initiation of PT/OT and the use of sentinel lymph node biopsy were independently associated with reduced lymphedema risk following mastectomy.
- These real-world findings support current ASCO and NCCN guidelines advocating for early rehabilitation and limited axillary surgery to minimize long-term morbidity in breast cancer survivors.

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