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Optimizing Recovery: Multimodal Physiotherapy for Secondary Lymphedema Post-Lumpectomy in a Geriatric Breast Cancer Patient: A Case Report

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Abstract

Breast Cancer-Related Lymphedema (BCRL) is a chronic and debilitating complication following breast cancer treatment, with older adults being particularly vulnerable due to age-related physiological changes. Early physiotherapy plays a pivotal role in reducing lymphedema progression and improving function. This case report describes a 70-year-old woman with secondary lymphedema involving the left upper limb and bilateral lower limbs following a left breast lumpectomy (2020) and recurrent breast cancer (2025). She presented with fatigue, sleep disturbances, restricted shoulder mobility, weakness, and difficulty with daily activities. Initial evaluation indicated Stage 3 lymphedema with impaired functional scores (QuickDASH: 59/100; BFI: 6.88). An eight-week multimodal physiotherapy program, including manual lymphatic drainage, compression bandaging, Kinesio taping, therapeutic exercise, posture correction, breathing training, neurodynamics, yoga-based therapy, and self-management education, resulted in significant improvements. Post-intervention, she demonstrated reduced edema, improved mobility and strength, decreased fatigue, and enhanced independence. This case underscores the value of structured physiotherapy in managing BCRL in geriatric patients.

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Introduction

Breast cancer remains one of the most prevalent malignancies among women worldwide and continues to contribute significantly to long-term morbidity despite advances in diagnosis and treatment. Among the late complications of breast cancer management, breast cancer–related lymphedema (BCRL) is a common and persistent condition resulting from disruption of the lymphatic system caused by surgery, radiation, and lymph node removal. This disruption leads to the retention of protein-rich interstitial fluid, progressive swelling, fibrosis, pain, and reduced functional capacity. Recent literature reinforces the chronic and disabling nature of lymphedema and highlights the need for continued surveillance in breast cancer survivors [1].

Multiple risk factors increase the likelihood of developing BCRL, including axillary lymph node dissection, radiotherapy, infections, and elevated body mass index [2]. Due to inconsistent diagnostic criteria, the reported prevalence varies; however, lymphedema remains a major rehabilitation challenge, leading to functional limitations, restricted shoulder mobility, and increased vulnerability to skin complications. Beyond physical impairment, lymphedema also affects psychosocial well-being, reducing confidence, independence, and overall quality of life. Fu notes that up to 40% of breast cancer survivors may develop lymphedema, underscoring the importance of early detection and timely intervention [3].

Chronic lymphedema, whether primary or secondary, can predispose individuals to serious complications. Case literature describes recurrent infections, cellulitis, tissue stiffness, and in severe cases, systemic effects such as pleural effusions, demonstrating how prolonged lymphatic dysfunction can progress if not adequately managed [4]. Although your patient developed secondary lymphedema due to breast cancer treatment, the chronic complications reported across lymphedema literature highlight the importance of comprehensive and continuous management.

Physiotherapy remains the cornerstone of conservative lymphedema care. Complete Decongestive Therapy, comprising manual lymphatic drainage, compression therapy, therapeutic exercise, and skin care, is widely considered the gold standard for symptom control and functional restoration. Individualized programs are especially important for older adults, who may experience age-related muscle weakness, fatigue, and reduced activity following cancer treatment. This case report describes the physiotherapy evaluation and multimodal management of secondary lymphedema in a geriatric breast cancer survivor after lumpectomy, emphasizing the importance of structured rehabilitation in improving limb function, mobility, and quality of life.

Case Description

A 70-year-old female with a history of carcinoma of the left breast underwent a lumpectomy in 2020. Postoperatively, she received eight cycles of chemotherapy over five months and 32 sessions of radiotherapy.

In 2023, she underwent surgical management for endometriosis. In 2025, she experienced a recurrence of breast cancer, for which she received one cycle of chemotherapy and six sessions of radiotherapy. The patient presented with secondary lymphedema of the left upper limb and bilateral lower limbs, along with fatigue, disturbed sleep, reduced shoulder mobility, weakness, and difficulty performing Activities of Daily Living (ADLs). She reported unexplained weight fluctuations, dizziness, and generalized muscular weakness. Her medical history was negative for diabetes mellitus, hypertension, and pulmonary tuberculosis. There was no family history of BRCA-related cancer. She reported a mixed Indian diet with reduced appetite and recent weight loss. She had menarche at 14 years, menopause at 21 years prior, and an obstetric history of gravida 4, para 4, all vaginal deliveries. The patient belonged to the upper-middle socioeconomic class, as determined using the Modified Kuppuswamy Scale, which classifies socioeconomic status based on education, occupation, and family income [5].

On general examination, the patient was oriented, comfortable, and hemodynamically stable (pulse 86 bpm, BP 110/80 mmHg, RR 18/min). Height and weight were 156 cm and 62 kg, respectively (BMI 25.5 kg/m²). Clinical evaluation demonstrated Stage 3 lymphedema, as per the International Society of Lymphology (ISL) staging system, predominantly affecting the left upper limb (Figure 1) and the bilateral lower limbs (Figure 2) [6]. The chronological sequence of major clinical events is summarized in Table 1.

Figure 1: Left Upper Extremity Demonstrating Stage 3 Secondary Lymphedema Following Breast Cancer Treatment

Figure 2: Clinical Presentation of Bilateral Lower Limb Lymphedema

Table 1: Timeline of Clinical Events

Time	Clinical Event	Management
2020	Left breast carcinoma diagnosed	Lumpectomy, 8 cycles of chemotherapy, 32 radiotherapy sessions
2023	Endometriosis	Surgical management
2025	Breast cancer recurrence	1 cycle chemotherapy, 6 radiotherapy sessions
Baseline (2025)	Physiotherapy assessment	Stage 3 lymphedema; QuickDASH 59/100; BFI 6.88
8-week follow-up	Multimodal physiotherapy program	MLD, compression, exercise, yoga, education

On Examination

During the physical examination, the shoulder range of motion was assessed in a seated position, and the findings are presented in Table 2. Significant limitations were observed in the patient's left shoulder flexion and abduction compared with the contralateral side, with pre-treatment values of 150° for flexion and 140° for abduction. Manual muscle testing, conducted according to standard grading criteria, revealed reduced strength in the affected upper limb. The left deltoid and extensor carpi muscles demonstrated Grade 4 strength, grip strength was diminished, and other muscle groups in the left upper extremity showed Grades 3-4 strength. In contrast, the right upper extremity maintained preserved muscle strength (Grades 4 5). Circumferential limb measurements, summarized in Table 3, confirmed notable swelling differences between the affected and unaffected limbs. Sensory examination of both upper extremities was intact, and deep tendon reflexes, including the biceps (C5-C6), triceps (C7), and brachioradialis (C5-C6), were normal bilaterally (2+).

Special tests were performed to assess the integrity of specific shoulder structures. These included the Hawkins-Kennedy Impingement Test (sensitivity 79%, specificity 59% for subacromial impingement), Speed's Test (sensitivity 54%, specificity 81% for biceps pathology), the Drop Arm Test (sensitivity 24%, specificity 96% for rotator cuff rupture) [10], the Empty Can Test (sensitivity 86%, specificity 50% for supraspinatus tendon involvement), and the Subscapularis Lift-Off Test (sensitivity 97%, specificity 96% for subscapularis tears) [7-10]. All special tests were negative bilaterally.

Table 2: Depicts the ROM of the Left Upper Extremity

	Before the comprehensive treatment	After the comprehensive treatment
Range of flexion	150°	170°
Range of shoulder abduction	140°	165°
Range of elbow flexion	120°	140°
Range of wrist dorsiflex	40°	55°

Table 3: Circumferential Measurements of Both Right and Left Upper Limbs

Point of measurement	Left arm	Right arm
Tip of the shoulder	40 cm	35 cm
4 inches below the shoulder tip	39 cm	32 cm
4 inches above the elbow joint	37 cm	28 cm
At the elbow joint	34 cm	24 cm
4 inches below the elbow joint	31 cm	21 cm
4 inches above the wrist joint	26 cm	17 cm
At the wrist joint	19 cm	15 cm
Palm to dorsum	17 cm	17 cm

The functional outcome measure selected for this patient was believed to be the Disabilities of the Arm, Shoulder, and Hand Score, also referred to as the Quick DASH, with an overall rating of 79% sensitivity and 75% specificity, and the brief fatigue inventory has been reported 0.682- 0.90 (test -retest reliability), Internal consistency-0.82-0.97. The patient scores 59.0/100 on the Quick DASH scale, reflecting a moderately severe disability level with gross motor tasks, including recreational practices incorporating force through the upper extremity, social activities with friends, family, neighbours, or any groups, and with work and other routine daily activities. The patient results on the Brief Fatigue Inventory were 6.88, a moderate fatigue level. The fatigue score is a meaningful contribution to the patient's functional capacity and well-being. Cancer-Related Fatigue (CRF) is "a distressing, persistent, subjective sense of tiredness or exhaustion related to cancer or cancer treatment that is not proportional to recent activity and interferes with usual functioning". ARF can occur in different contexts during treatment as a result of different chemotherapy agents, surgery, and/or radiation, which may contribute to acute or persistent CRF, e.g., how tolerable they find their therapy [11,12].

Intervention

The patient underwent a structured, multimodal eight-week physiotherapy program, divided into four progressive phases targeting edema reduction, mobility restoration, strength recovery, functional reintegration, and long-term maintenance.

Phase 1: Acute Phase (Week 1-2) - Edema Control and Gentle Activation

Manual Lymphatic Drainage (MLD): Daily proximal-to-distal gentle circular strokes by a trained physiotherapist, targeting axillary and supraclavicular nodes to facilitate lymphatic drainage.
Multi-layer Lymphedema Bandaging (MLLB): Short-stretch compression bandaging applied distally to proximally to maintain pressure gradients and enhance lymphatic return.
Kinesio Taping (KT): Fan-pattern application on the affected limb to lift the skin and support lymphatic flow.
Diaphragmatic Breathing: 10–15 deep breaths, three times daily, to enhance thoracic duct drainage.
Isometric Strengthening: Low-intensity isometrics for shoulder, elbow, wrist, and knee muscles to stimulate lymphatic muscle pumps.
Postural Correction: Scapular retraction, wall-supported standing, and thoracic extension exercises.
Patient Education: Skin care, limb positioning, early warning signs of infection, and self-monitoring.

Phase 2: Subacute Phase (Week 3-4) - Restoration of Joint Mobility, Muscle Strength, and Functional Recovery

Active-Assisted ROM: Shoulder flexion, abduction, and rotation exercises using pulleys and cane-assisted movements, 10–12 repetitions, 2–3 times/day.
Resistance Band Strengthening: Low-intensity bands (yellow) for deltoid, biceps, and wrist extensors.
Grip Strengthening: Putty and soft ball exercises.
Functional Electrical Stimulation (FES): Deltoid and forearm extensors (35–50 Hz, 15–20 min/session) for muscle re-education.
Neurodynamic Mobilization: Median nerve glides with shoulder abduction, wrist, and elbow extension, 3 sets of 10 repetitions.
Home Program: Continuation of MLD, KT, and basic ROM exercises.

Phase 3: Functional Phase (Week 5-6) - Task-Oriented Movement and Endurance

Closed-Chain Upper Limb Exercises: Wall push-ups, towel slides to improve scapular control.
Progressive Resistance Training: Dumbbells (0.5–1 kg), twice weekly.
Endurance Training: Recumbent bike or seated marching, 5–10 min progressing to 20 min/day.
Yoga-Based Therapy: Modified asanas (Tadasana, Bhujangasana, Viparita Karani) for circulation, relaxation, and lymphatic drainage.
Cognitive-Motor Dual Task Training: Walking while performing cognitive tasks to enhance balance and coordination.

Phase 4: Advanced and Maintenance Phase (Week 7-8) - Independence and ADL Reintegration

Self-Management: Education on self-MLD, self-bandaging, KT application, and home exercise.
Advanced Strengthening: Theraband rows, shoulder scaption, functional lifting tasks, thrice weekly.
Postural Training: Wall angles, thoracic extension exercises.
ADL Retraining: Simulated tasks such as washing clothes, combing hair, cooking with affected limb use.
Yoga Program Continuation: Emphasis on breath control, static holds, and mindfulness.
Fatigue Management Education: Activity pacing, energy conservation, structured rest.
Caregiver Training: Ensuring continued support, monitoring, and adherence.

Outcome:

Post-intervention, the patient demonstrated:
Reduction in limb circumference and edema.
Improved shoulder ROM (flexion 170°, abduction 165°).
Increased upper limb muscle strength (grades 4–5).
Improved functional independence (QuickDASH 30/100).
Reduced fatigue levels (BFI 3.2).

Discussion

Breast cancer-related lymphedema (BCRL) remains a serious and persistent complication among breast cancer survivors, often with substantial impact on limb function, quality of life, and independence, particularly in older patients or those with advanced disease. Conservative management using Complete Decongestive Therapy (CDT), which typically includes compression, exercise, manual lymphatic drainage (MLD), skin care and self-management, has long been considered the standard of care. However, the evidence supporting the efficacy of individual components within CDT, especially MLD, is mixed and in some cases contradictory. A recent systematic review of systematic reviews found that while CDT can lead to volume reduction in many patients, the quality of evidence remains variable and often low, particularly regarding

MLD's additional benefit over compression alone [13].

Indeed, earlier meta-analyses have concluded that adding MLD to compression and exercise does not consistently lead to greater reduction in arm volume compared with compression and exercise alone [14]. A randomized controlled trial comparing MLD plus multi-layer compression bandaging (CB) with CB alone demonstrated that both groups had significant volume reductions after 4 weeks, but the added advantage of MLD over CB alone was evident only in patients with mild lymphedema; in moderate to severe lymphedema, CB alone sufficed [15]. These findings suggest that compression therapy remains the most consistently effective component for volume reduction, and that the incremental effect of MLD may be limited, especially in more advanced stages.

In contrast, accumulating data support the safety and potential benefits of structured resistance exercise in BCRL management. A large cohort study of breast cancer survivors reported that intense upper limb resistance training was not associated with exacerbation of lymphedema; instead, it resulted in reduced extracellular water ratios and increased lean mass in the affected arms, indicating improved fluid balance and tissue composition [16]. Similarly, a systematic review meta-analysis on resistance exercise training (RET) in BCRL concluded that RET confers clear strength gains without provoking lymphedema exacerbation [17]. These findings challenge older clinical paradigms that discouraged upper limb strengthening in BCRL, and support inclusion of carefully supervised resistance training in rehabilitation protocols.

Moreover, a recent randomized cross-over trial comparing moderate-load upper-body resistance exercise with vs without compression in women with BCRL found no acute deterioration in lymphedema status or symptoms even in the non-compression condition; measures of bioimpedance (L Dex), circumference, and patient-reported swelling/heaviness remained stable up to 24hours post exercise [18]. Another investigation reported that remedial exercises + compression bandaging resulted in significant reductions in lymphedema severity and symptom burden within 24 hours, whereas exercise alone did not cause worsening supporting the notion that compression may enhance benefits, but exercise by itself is not necessarily harmful when monitored appropriately [19].

Given this nuanced and evolving evidence base, the present case an elderly (70 year-old) woman with advanced (Stage 3) BCRL is particularly instructive. Over an 8 week, individualized, multimodal physiotherapy program including compression bandaging, therapeutic exercise (resistance and functional), neurodynamic mobilization, postural correction, and self-management education, she showed clinically meaningful improvements in limb circumference (edema), shoulder range of motion, muscle strength, fatigue, and functional independence. These outcomes underscore several important implications: Real world feasibility in geriatric, late-stage BCRL: Many randomized trials exclude older patients or those with chronic, severe lymphedema. Our case demonstrates that even in a geriatric, Stage 3 BCRL patient, multimodal physiotherapy can be tolerated and effective. Support for integrated, individualized rehabilitation: Given inconsistent evidence for MLD alone and growing support for exercise + compression (and possibly other modalities), our results strengthen the argument for a tailored, comprehensive rehabilitation plan rather than reliance on a single modality. Functional and quality-of-life gains beyond volume reduction: While many studies focus on volumetric outcomes, the improvements in mobility, strength, fatigue, and functional ADLs in our patient highlight the broader benefits of physiotherapy, especially relevant in elderly cancer survivors whose priorities may shift toward independence and quality of life.

Nevertheless, limitations in the literature and in this case must be acknowledged. Many systematic reviews note heterogeneity in study design, small sample sizes, variable intervention protocols, and inconsistent outcome measures, which hamper firm conclusions and generalizability [13,17]. In randomized trials, follow-up periods are frequently short, and long term sustainability of volume reduction and functional gains remains uncertain. In our case, as with any case report, the absence of a control group and potential for measurement bias or natural fluctuation in edema cannot be excluded. Given these gaps, there is a clear need for high-quality randomized controlled trials in diverse BCRL populations especially including older adults and those with chronic, advanced lymphedema with standardized intervention protocols (compression intensity/duration, exercise type/dose, neurodynamic or manual therapy), uniform outcome measures (volume, fluid balance, functional scores, quality of life), and long-term follow-up to assess maintenance, adherence, and safety. In light of current evidence and our clinical experience, it is reasonable and likely beneficial for clinicians to prescribe early, individualized, and multimodal physiotherapy (including compression, resistance/functional exercise, neurodynamics, postural training, and patient education) for BCRL patients, regardless of age or stage, with the dual goals of minimizing edema and optimizing functional recovery and quality of life.

Conclusion

This case highlights the effectiveness of an individualized, multimodal physiotherapy program in managing advanced breast cancer–related lymphedema in a geriatric patient. Structured interventions, including manual lymphatic drainage, compression therapy, therapeutic exercise, neurodynamic mobilization, postural correction, and patient education, led to clinically meaningful improvements in limb volume, shoulder range of motion, muscle strength, fatigue, and functional independence. The case underscores that early, consistent, and tailored rehabilitation can significantly enhance quality of life, even in older adults with chronic, severe lymphedema. These findings support the integration of comprehensive physiotherapy strategies in routine care for breast cancer survivors to optimize functional outcomes and minimize long-term complications.

Declarations

Author Contributions: All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and Design: Thakur A

Acquisition, Analysis, or Interpretation of Data: Saini P, Sharma A

Drafting of the Manuscript: Thakur A, Kabba D

Critical review of the manuscript for important intellectual content: Saini P

Supervision: Thakur A, Rai V, Kabba D

Ethics Statement / Patient Consent

All procedures performed in this study were in accordance with the ethical standards of our institutional research committee and the 1964 Declaration of Helsinki and its later amendments. Written informed consent for publication of this case report and any accompanying images was obtained from the patient. Patient anonymity and confidentiality were preserved.

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