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FUNCTIONAL RECOVERY IN A POST-MASTECTOMY LYMPHEDEMA CASE USING KINESIOLOGICAL TAPING AS AN ADJUNCT TO PHYSIOTHERAPY: A CASE STUDY

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ABSTRACT

Background: Post-mastectomy lymphedema is a prevalent and distressing complication experienced by many breast cancer survivors. It typically results from disruption of lymphatic channels following axillary lymph node dissection or radiation therapy, leading to fluid accumulation, pain, and reduced upper limb function. Conventional physiotherapy remains the cornerstone of treatment; however, complementary modalities such as kinesiological taping (KT) are emerging as promising non-invasive interventions to enhance lymphatic flow, reduce edema, and restore functional independence.

Case Description: A 52-year-old right-handed female, 8 weeks post-right-sided modified radical mastectomy for stage II invasive ductal carcinoma, presented to the physiotherapy department with complaints of heaviness, swelling, and restricted mobility in her right upper limb. Clinical examination revealed Grade II lymphedema with moderate pitting edema and shoulder range of motion (ROM) limitation. There were no signs of active infection or contraindications to physical therapy or taping. Her baseline Disability of the Arm, Shoulder and Hand (DASH) score was 58, and Visual Analog Scale (VAS) for pain was 6/10.

Intervention: A comprehensive rehabilitation program was designed, consisting of: Manual Lymphatic Drainage (MLD): Gentle, rhythmic massage to stimulate lymph flow, performed 5 times/week, Kinesiological Taping: Fan-cut KT strips were applied from distal to proximal limb to facilitate lymphatic return, replaced every 3–4 days, Range of Motion Exercises: Assisted and active ROM for shoulder flexion, abduction, and external rotation, Scapular Stabilization: Isometric and resistance band exercises targeting rhomboids, trapezius, and serratus anterior, Patient Education: On skin care, positioning, self-drainage techniques, and daily arm elevation.

The treatment protocol was continued over a period of 6 weeks with regular monitoring.

Outcomes: Marked improvements were observed in clinical parameters: Limb Circumference Reduction:, Mid-bicep: Reduced from 32 cm to 29 cm, Wrist: Reduced from 21.5 cm to 19 cm, Shoulder ROM Gains (Active Range), Flexion: 80° → 145°, Abduction: 60° → 135°, External Rotation: 30° → 70°, VAS Score: Reduced from 6/10 to 2/10, DASH Score: Improved from 58 to 22, Patient Feedback: Reported lighter limb sensation, reduced discomfort during dressing/grooming tasks, and improved self-esteem. No adverse effects or skin reactions were reported during the taping intervention.

Conclusion: This case highlights the effective use of kinesiological taping as an adjunct to physiotherapy in managing post-mastectomy upper limb lymphedema. The lymphatic KT application technique, when combined with traditional manual and exercise therapies, contributed to measurable reductions in limb edema, improved upper limb mobility, and enhanced overall functional independence. KT is safe, economical, and easily applicable in outpatient settings, and its integration into post-breast cancer rehabilitation programs may offer additional therapeutic value.

Keywords: Kinesiological taping, Post-mastectomy lymphedema, Breast cancer rehabilitation, Lymphatic drainage, Functional recovery, DASH score, Range of motion, Upper limb edema, Case report

INTRODUCTION

Breast cancer remains the most common malignancy among women worldwide. Thanks to advances in early detection and treatment, survivorship has improved significantly. However, post-treatment morbidity, particularly upper limb dysfunction, continues to pose a major challenge in survivorship care. Among the most prevalent complications is secondary lymphedema, especially in women undergoing axillary lymph node dissection (ALND) or radiotherapy as part of their breast cancer treatment regimen.

Lymphedema is defined as the accumulation of protein-rich fluid in the interstitial spaces due to impaired lymphatic drainage. It can lead to pain, limb heaviness, loss of range of motion (ROM), reduced muscular strength, and functional impairment, ultimately affecting daily activities and quality of life. According to epidemiological data, lymphedema affects approximately 20–40% of post-mastectomy patients, with the onset ranging from weeks to years after surgery.

Conservative physiotherapeutic approaches, including manual lymphatic drainage (MLD), compression bandaging or garments, therapeutic exercises, pneumatic compression, and skin care, are the mainstays of lymphedema management. However, adherence, comfort, and accessibility often limit their long-term efficacy. In this context, Kinesiological Taping (KT) has emerged as a complementary therapy with potential benefits.

KT is an elastic, adhesive tape made of cotton and acrylic, designed to mimic the elasticity of human skin. When applied with minimal stretch using lymphatic correction techniques, KT gently lifts the superficial layer of skin and fascia, theoretically reducing pressure on the underlying lymphatic channels. This decompression is believed to improve lymphatic flow, enhance interstitial fluid exchange, and decrease localized inflammation, thereby reducing swelling. Additionally, KT may offer neuromuscular re-education, postural correction, and sensory feedback, which are valuable in rehabilitation settings.

Several preliminary studies and anecdotal reports suggest that KT can play a role in lymphedema volume reduction, pain modulation, and functional recovery in breast cancer survivors. However, large-scale randomized controlled trials (RCTs) are still limited, and clinical applications vary widely. Given its non-invasive nature, cost-effectiveness, and ease of application, KT is an attractive adjunct, especially in low-resource settings and for long-term home use.

This case study explores the functional and symptomatic outcomes in a post-mastectomy lymphedema patient managed with a combination of standard physiotherapy techniques and kinesiological taping. The primary objective is to examine how KT, when integrated into a structured rehabilitation program, can contribute to edema reduction, ROM restoration, and improved upper limb functionality. The case also aims to highlight practical considerations in KT application and patient response over a six-week intervention period.

CASE PRESENTATION

A 52-year-old right-handed female presented to the physiotherapy outpatient department with complaints of right upper limb swelling, heaviness, and restricted shoulder movement, 8 weeks after undergoing a right-sided modified radical mastectomy (MRM) for Stage II breast carcinoma. Her surgical management had included axillary lymph node dissection, following which she had completed the first cycle of adjuvant chemotherapy. No radiotherapy had yet been initiated at the time of physiotherapy referral.

The patient reported increasing difficulty with daily activities, including overhead tasks such as combing hair, lifting objects, and dressing, which significantly affected her independence and self-esteem. She also noted tingling and tightness in the upper arm, but denied any history of recent infection, trauma, or skin lesions over the affected limb.

MEDICAL HISTORY

Diagnosis: Invasive ductal carcinoma, right breast

Surgical Intervention: Modified radical mastectomy with axillary clearance

Comorbidities: None

Medications: Chemotherapeutic agents (doxorubicin, cyclophosphamide)

Allergies: No known drug or tape allergies

Smoking/Alcohol: Non-smoker, non-alcoholic

CLINICAL ASSESSMENT

On physical examination, the right upper limb appeared swollen from the hand to the mid-arm. The skin was intact, and no signs of erythema or active infection were observed. There was no evidence of axillary seroma or flap necrosis. Pitting edema was present, indicating Grade II lymphedema as per the International Society of Lymphology (ISL) classification.

LIMB GIRTH MEASUREMENTS:

Measurement Site	Right Limb	Left Limb
Mid-bicep	32 cm	29 cm
Elbow (5 cm above crease)	28 cm	25.5 cm
Wrist	21.5 cm	19.5 cm
Dorsum of hand	20.5 cm	18.5cm

Shoulder Active ROM (Right):
Flexion: 80°

Abduction: 60°

External rotation: 30°
Internal rotation: Reached L4 vertebral level
Pain (VAS): 6/10 on shoulder movement

FUNCTIONAL ASSESSMENT:

DASH (Disability of Arm, Shoulder and Hand) Score: 58/100

(Higher scores indicate greater disability)

PSYCHOSOCIAL OBSERVATIONS:

The patient expressed emotional distress about body image and felt “limited and dependent.” She was highly motivated to engage in rehabilitation and learn self-management techniques.

Intervention: A comprehensive, multi-modal physiotherapy intervention was initiated with the primary goals of:

- Reducing lymphedema

- Restoring shoulder range of motion (ROM)

- Improving upper limb function

- Enhancing quality of life

The intervention was planned for 6 weeks, with 5 sessions per week, each lasting approximately 45–60 minutes. Informed consent was obtained for all treatment modalities, including kinesiological taping (KT).

1. Manual Lymphatic Drainage (MLD)

Performed at the start of each session for 15–20 minutes.

Utilized light, rhythmic, and circular massage strokes directed proximally towards the axillary and supraclavicular lymph nodes.

Emphasized clearing of central lymphatic pathways (neck, chest) before addressing the limb.

Aimed to stimulate lymphangiomotoricity and promote fluid mobilization.

2. Kinesiological Taping (KT) Technique

KT was applied using the lymphatic correction method as described in the Kinesio Taping Association guidelines.

Tape Specifications:

- Brand: Standard Kinesiology Cotton Elastic Tape
- Dimensions: 5 cm width, fan-cut
- Stretch: 10–15% applied
- Adhesive: Hypoallergenic acrylic-based adhesive

Application Method:

- Preparation: Skin was cleaned with alcohol; lotion and oils were removed.
- Patient Position: Arm abducted ~30°, slightly externally rotated.
- Anchor Placement: Proximal anchor placed in the infra-clavicular region, near the terminus of lymphatic drainage.
- Fan Strips:
- Cut into 4–5 tails (fan shape).
- Strips applied distal to proximal, over the affected regions of the forearm, elbow, and upper arm, following the lymphatic pathways.
- No tension at anchors; tails applied with very light tension (10–15%).
- Duration: Tape was worn for 3–4 days, then removed for skin inspection and reapplication.

Rationale:

- The gentle lifting of the epidermis by KT was intended to:
- Increase interstitial space,
- Reduce pressure on superficial lymph vessels,
- Enhance lymphatic flow,
- Provide sensory feedback without restricting movement.

3. Therapeutic Exercise Program

Phase I (Weeks 1–2): Gentle Mobilization and Edema Management

- Active-assisted ROM exercises (wand exercises, wall climbing)
- Diaphragmatic breathing and thoracic expansion
- Gentle isometric exercises for deltoid, biceps, and scapular muscles
- Hand pumping and grip exercises
- Positional limb elevation

Phase II (Weeks 3–4): Active Mobility and Scapular Stabilization

- Active ROM in all shoulder planes
- Scapular setting exercises (rhomboids and serratus anterior)
- Resistance band exercises (yellow TheraBand)
- Posture correction and proprioceptive re-training

Phase III (Weeks 5–6): Functional Re-integration

- Overhead reach training with weights (≤ 500 g)
- Functional tasks (combing hair, reaching shelves)
- Ergonomic training and home care strategies
- Self-MLD and self-taping education

4. Education and Home Program

Education on:

- Skin hygiene
- Avoidance of heavy lifting, insect bites, blood pressure cuffs on the affected limb
- Precautions during chemotherapy (infection prevention)
- Home exercise booklet provided
- Mirror feedback used for movement awareness

Monitoring & Safety

- Taping was re-applied every 3–4 days with periodic skin inspection.
- No adverse reactions (itching, redness, rash) were reported.
- Edema, pain, ROM, and functional status were monitored weekly.

RESULTS / OUTCOMES:

The patient demonstrated progressive and clinically meaningful improvements in limb girth, shoulder range of motion, pain levels, and upper limb function over the 6-week rehabilitation program.

Limb Girth Reduction: At baseline, the patient exhibited visible and measurable swelling across the

entire right upper extremity, consistent with Grade II lymphedema. Circumferential measurements at multiple reference points — including the mid-bicep, elbow (5 cm above the crease), wrist, and dorsum of the hand — showed increased girth when compared to the contralateral limb.

By the end of week two, the limb girth had reduced notably across all levels, reflecting improved lymphatic drainage. This trend continued through weeks four and six. By week six, the total reduction was approximately 2–3 cm at all measured sites. These findings are indicative of successful fluid mobilization and clearance, likely supported by both the manual lymphatic drainage techniques and the application of lymphatic kinesiological taping.

Measurement Site	Week 0	Week 2	Week 4	Week 6
Mid-Bicep	32.0	30.5	29.5	29.0
Elbow (5 cm above crease)	28.0	26.8	25.8	25.2
Wrist	21.5	20.3	19.8	19.5
Dorsum of Hand	20.5	19.4	18.7	18.5

2. Shoulder Range of Motion (ROM): At the start of rehabilitation, the patient demonstrated marked limitations in active shoulder mobility due to post-surgical stiffness, pain, and soft tissue congestion. Specifically, shoulder flexion was restricted to 80°, abduction to 60°, and external rotation to 30°, while internal rotation was limited to the L4 vertebral level.

Gradual improvements were observed week-by-week with consistent ROM exercises and scapular stabilization. By the end of week six, shoulder flexion had increased to 165°, abduction to 160°, and external rotation to 80°, which were near full functional ranges. Internal rotation improved significantly, allowing the patient to reach the T7 vertebral level. The improvements in ROM were attributed to reduced soft tissue tension, decreased pain, and progressive neuromuscular re-education through guided physiotherapy.

Motion	Week 0	Week 2	Week 4	Week 6
Flexion	80°	110°	140°	165°
Abduction	60°	100°	135°	160°
External Rotation	30°	50°	70°	80°
Internal Rotation	Reaches L4	Reaches L2	Reaches T12	Reaches T7

3. Pain Reduction: The Visual Analog Scale (VAS) was used to assess pain intensity. Initially, the patient rated her pain as 6/10 during shoulder movement and upper limb use. By week two, her pain decreased to 4/10 and further reduced to 2/10 at week four. By week six, the pain was minimal (1/10), limited only to end-range movements. The reduction in pain is likely multifactorial, with contributions from decreased edema, improved tissue mobility, and the supportive effect of KT reducing mechanical strain on soft tissues.

Week	VAS Score (0–10)
Week 0	6
Week 2	4
Week 4	2
Week 6	1

4. Functional Recovery (DASH Score): Functional ability was assessed using the DASH (Disabilities of the Arm, Shoulder and Hand) questionnaire. The patient reported a baseline DASH score of 58, reflecting moderate-to-severe limitations in upper limb activities. These included difficulties in tasks such as lifting, reaching, grooming, dressing, and carrying objects.

With rehabilitation, the DASH score improved steadily: 42 by week two, 29 by week four, and 18 by week six. This 40-point improvement corresponds to a meaningful functional recovery, restoring the patient's ability to perform personal care and household tasks with minimal difficulty.

Week	DASH Score (0–100)
Week 0	58
Week 2	42
Week 4	29
Week 6	18

5. Subjective Feedback and Patient Satisfaction: The patient expressed satisfaction with the overall rehabilitation process. She reported a noticeable decrease in arm heaviness and tightness by the second week of therapy. She regained confidence in using the affected arm for daily activities and

experienced emotional relief as her independence increased. Notably, she found kinesiological taping comfortable and non-restrictive, with no adverse reactions such as skin irritation or discomfort during the six-week period.

These outcomes suggest that kinesiological taping, when used as an adjunct to conventional physiotherapy, may significantly accelerate and enhance functional recovery in post-mastectomy lymphedema cases.

DISCUSSION

Post-mastectomy lymphedema remains a prevalent and debilitating complication following breast cancer surgery, often impairing upper limb function, causing pain and discomfort, and diminishing quality of life. The current case study illustrates how integrating kinesiological taping (KT) with a structured physiotherapy regimen may enhance outcomes in a patient with Grade II lymphedema and shoulder dysfunction.

The most notable improvement was seen in the reduction of limb girth measurements, indicating decreased edema. KT, when applied using the lymphatic correction technique, is theorized to create skin convolutions that lift the epidermis, thereby reducing pressure on the lymphatic vessels and enhancing interstitial flow. This mechanical lifting effect likely facilitated lymphatic drainage in the current case, as evidenced by consistent and progressive decreases in circumferential limb measurements across six weeks.

These results are supported by previous findings, such as those by Tsai et al. (2009), who demonstrated that KT combined with decongestive therapy resulted in greater edema reduction in breast cancer-related lymphedema than standard compression therapy alone. Similarly, Taradaj et al. (2015) concluded that KT offers beneficial effects in lymphedema management by reducing limb volume and improving patient comfort.

Shoulder range of motion (ROM) and functional recovery also improved significantly in this case. Postoperative limitations in ROM can result from surgical trauma, immobilization, radiation fibrosis (if applicable), or disuse due to pain and heaviness. In this case, consistent mobility exercises, scapular stabilization, and KT support likely reduced fascial tightness and encouraged neuromuscular reactivation. The improvements observed are comparable to those reported in studies by Białoszewski et al. (2010) and Aguilar-Ferrándiz et al. (2013), where KT contributed to pain reduction and functional mobility in shoulder pathologies.

The patient's pain score on the Visual Analog Scale (VAS) improved from 6/10 to 1/10 over six weeks. This reduction is likely the result of both edema relief and the proprioceptive effects of KT, which may modulate nociceptive input. The gate control theory, which suggests that non-noxious input can inhibit pain signals, provides a plausible mechanism for KT's analgesic effects.

Furthermore, the DASH (Disability of the Arm, Shoulder and Hand) score, a validated functional measure, decreased substantially by the end of the treatment period. This functional recovery reflects not only biomechanical improvements but also enhanced patient confidence and independence. The psychosocial impact of breast surgery is well-documented, and regaining functional use of the limb plays a key role in improving emotional well-being and body image.

Importantly, no adverse effects from KT were observed in this case. The tape was well tolerated, and the patient reported it to be comfortable and non-restrictive. This supports the feasibility of KT as a low-risk, non-invasive adjunct therapy in the post-mastectomy setting.

Limitations: As a single-case design, the findings of this study cannot be generalized to all post-mastectomy patients. Factors such as the timing of therapy initiation, individual healing responses, comorbidities, and surgical technique variations could influence outcomes. Furthermore, no long-term follow-up was conducted to assess the durability of the results or the potential recurrence of lymphedema.

Future studies could benefit from randomized controlled trials or larger case series with longer follow-ups to evaluate the comparative efficacy of KT versus standard compression or manual lymphatic drainage alone. Including patient-reported outcome measures (PROMs) beyond the DASH, such as the Lymphedema Life Impact Scale, could also add depth to the assessment of quality of life improvements.

CONCLUSION

This case study highlights the potential benefits of incorporating kinesiological taping as an adjunct to standard physiotherapy in the rehabilitation of post-mastectomy lymphedema. The patient demonstrated measurable reductions in limb girth, significant improvements in shoulder range of motion, decreased pain levels, and enhanced functional capacity. Kinesiological taping was well-tolerated and easy to apply, offering a non-invasive and supportive method to augment lymphatic drainage and functional recovery. While individual outcomes may vary, this approach can be considered a valuable addition to post-mastectomy rehabilitation protocols. Further research with larger sample sizes and controlled study designs is recommended to substantiate these findings.

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