Efficacy of Scapular Mobilization and Myofascial Release on Shoulder Girdle Function after Mastectomy

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Abstract

Purpose: To determine the efficacy of scapular mobilization and muscle release in increasing the shoulder flexion and abduction range of motion after mastectomy.

Methods: This study was conducted on forty patients who had shoulder girdle dysfunction participated in this study. Their ages ranged from 35-65 years. The participants were selected from Oncology Center (Ayady El-Mostakbal Center for Oncology in Alexandria) and randomly distributed into two equal groups. Group (A) this group included 20 patients who had shoulder girdle dysfunction received scapular mobilization and muscle release treatment in addition to traditional shoulder exercises. 2 sessions per week for 24 sessions, time of treatment were 45min (5-10min) for scapular mobilization, 25min for muscle release and 10min for traditional exercises for shoulder. Group (B) this group included 20 patients who had shoulder girdle dysfunction received traditional shoulder exercises. Time was 15 minutes in each session, 2 sessions per week for 24 sessions. Patient continued these exercises as a home program, 10 repetitions of each exercise below 5 times a day. The study was conducted from December 2015 to March 2016.

Material and Methods: Goniometer was used to measure shoulder flexion and abduction range of motion, pressure algometer to measure the pain threshold and shoulder pain and disability index to determine the improvement of shoulder function. Results showed that both scapular mobilization and myofascial release with traditional exercises (Group A) and traditional shoulder exercises only (Group B) were effective in improvement function of shoulder girdle and pain threshold but scapular mobilization and myofascial release with traditional shoulder exercises (Group A) were more effective than traditional exercises only.

Conclusion: It can be concluded that scapular mobilization and myofascial release were valuable and effective method in increase shoulder flexion and abduction ROM, improving shoulder function and increasing pain threshold.

Key Words: Scapular mobilization – Myofascial release – Shoulder girdle function – Mastectomy.

Introduction

BREAST cancer is cancer that develops from breast tissue, signs of breast cancer may include a lump in the breast, a change in breast shape, dimpling of the skin, fluid coming from the nipple, or a red scaly patch of skin in those with distant spread of the disease, there may be bone pain, swollen lymph nodes, shortness of breath, or yellow skin [1].

The management of breast cancer depends on various factors, including the stage of the cancer and the age of the patient. Increasingly aggressive treatments are employed in accordance with the poorer the patient's prognosis and the higher the risk of recurrence of the cancer following treatment [2].

Breast cancer is usually treated with surgery, which may be followed by chemotherapy or radiation therapy, or both. A multidisciplinary approach is preferable [3]. Hormone receptor-positive cancers are often treated with hormone-blocking therapy over courses of several years. Monoclonal antibodies, or other immune-modulating treatments, may be administered in certain cases of metastatic and other advanced stages of breast cancer [2]. Surgery involves the physical removal of the tumor, typically along with some of the surrounding tissue. One or more lymph nodes may be biopsied during the surgery; increasingly the lymph node sampling is performed by a sentinel lymph node biopsy [1].

Mastectomy is an operation which causes many changes in a woman's body. Its consequence are,
Efficacy of Scapular Mobilization & Myofascial Release on Shoulder Girdle Function among other things, lymphatic edemas, limitation of movements and strength of the upper limb of the patient, experiences in the emotional sphere, difficulties related to the postoperative scar and the results of supplementing treatment such as radiotherapy or chemotherapy. Significant complications after mastectomy are changes in body posture caused both by disorders in body static as a result of amputation and limitation of movements and soreness of the spine.

Adverse changes in body posture of women after mastectomy in comparison with healthy women were found, manifested mainly in asymmetry of trunk and shoulder girdle and greater forward leaning of the trunk. Significant relationship was indicated between the operation of mastectomy and the asymmetry of position of scapula [4].

Normal pain free motion of the arm and shoulder requires mobility in the scapulothoracic, glenohumeral, acromioclavicular and sternoclavicular joint. The shoulder mechanism involves a combination of rotations and translations [5].

Muscle release promotes restoration of joint functions after an injury through elongation of shortened structures, which helps the restoration of range of motion [6].

Scapular mobilization is a useful manual therapy technique to apply to patients with limited shoulder after mastectomy it increases ROM, improve muscle spasm and decrease pain intensity [7].

**Subjects and Methods**

The study was conducted from December 2015 to March 2016. It was conducted on forty patients who had shoulder girdle dysfunction participated in this study. Their ages ranged from 35-65 years. The participants were selected from Oncology Center (Ayady El-Mostakbal Center for Oncology in Alexandria). They were females enrolled to the study and informed aconsent form, all had scapulothoracic and glenohumeral changes and had no any other shoulder problems. Patients were excluded if they had ages more than 65 years or less than 35 years, another any shoulder problems as frozen, impingement and supraspinatus tendonitis or suffering from any condition for which scapular mobilization and muscle release are contraindicated as metastasis or sever osteoporosis.

They were divided randomly into two equal Groups (A, B). Group A includes 20 patients who had shoulder girdle dysfunction and who received scapular mobilization and muscle release treatment in addition to traditional shoulder exercises as (shoulder shrug, circles, shoulder rolls, shoulder wings, arm circles, wall exercises, forward wall crawls and side wall crawls) 2 sessions per week for 24 session time of treatment will be 45min. Group B includes 20 patients who had shoulder girdle dysfunction and who received traditional shoulder exercises as (shoulder shrug, circles, shoulder rolls, shoulder wings, arm circles, wall exercises, forward wall crawls and side wall crawls) time was 10 minutes in each session 2 sessions per week for 24 session, patient continued these exercises as a home program, 10 repetitions of each exercise below 5 times a day.

Goniometer was used to measure range of motion joint angles of shoulder mainly flexion and abduction, algometer was used to measure pressure pain threshold of muscle trigger points due to tightness and pain and disability index to detect improvement of shoulder function.

**Treatment procedure:**

*Group A (study group):* It consisted of twenty patients who received scapular mobilization and myofascial release with traditional exercises for shoulder for 45 minutes per session (5-10min) for scapular mobilization, 25min for muscle release and 10min for traditional exercises for shoulder, two sessions per week for 24 sessions.

*Group B (control group):* It consisted of twenty patients who received traditional exercises for shoulder only. Time was 15 minutes in each session, 2 sessions per week for 24 sessions, patient continued these exercises as a home program, 10 repetitions of each exercise below 5 times a day.

**Scapular mobilization techniques:**

- Patient was in side lying position and bare skin.
- The therapist position faced the patient.
- The therapist mobilized scapula in all of its movement directions.
- Time of treatment was 5-10 minutes.
- Treatment performed 2 times/week for 12 week.
  - Pt. is side lying (facing the PT) with shoulder and elbow flexed and forearm resting on clinician's forearm.
  - PT: Lower hand is placed around the inferior angle of the scapula with the thumb and forefinger
along lateral and medial scapula borders. Upper hand grasps the spine of the scapula, cupping the heel of the hand anteriorly over the clavicle.

- For scapular elevation and depression Fig. (1): PT mobilizes scapula superior and inferior by using trunk to provide the key force through the arms.

- For scapular retraction and protraction Fig. (2): PT mobilizes scapula medially and laterally by using trunk to provide the key force through the arms.

- For scapular upward and downward rotation Fig. (3): PT mobilizes scapula in rotation upward and downward.

- Parameters: 8-10 reps of each movement—hold each mob for 6 seconds.

- *Note: Pt. must completely relax scapular musculature [8].

Muscle release technique:

Each patient in group received this technique 2 times/week for 12 weeks.

Preparation of the patient:

- The patient to be treated was bare skin.

- The position of the patient was supine/sidelying position.

- The patient was informed about the technique and its effects.

- The skin of patient was cleaned before treatment.

- The therapist used oil to apply this technique.

The therapist applied direct technique:

- Land on the surface of the body with the appropriate ‘tool’ (knuckles, or forearm or palm finger tips etc.).

- Sink into the soft tissue.

- Contact the first barrier/restricted layer.

- Put in a ‘line of tension’.

- Engage the fascia by taking up the slack in the tissue.

- Finally, move or drag the fascia across the surface while staying in touch with the underlying layers.

- Exit gracefully [9].

Muscles were involved in this technique are (pectoralis major Fig. (4), subscabularis Fig. (5), and serratus anterior Fig. (6) and upper trapizeus Fig. (7). Time of treatment was 25 minutes/session.

Traditional exercises for shoulder:

- Patient in sitting or standing position.

- Time was 10 minutes in each session.

- Patient continued these exercises as a home program.

- Do 10 repetitions of each exercise below 5 times a day.

  - Shoulder rolls.

  - Shoulder wings.

  - Arm circles.

  - Wall exercises.

  - Forward wall crawls.

  - Side wall crawls [10].

Measuring equipments:

1- Goniometer: Is an instrument which measures range of motion joint angles of shoulder mainly flexion and abduction.

The universal standard goniometer is a plastic or metal tool with 1 degree increments. The arms usually are not longer than 12-inches so it can be hard to accurately pinpoint the exact landmark needed for measurement [11].

2- Algometer: Tool for measuring pressure pain threshold of muscle trigger points due to tightness [12].

3- Shoulder pain and disability index: This aims to present the best functional/disability indices to use in clinical practice; providing the reader with a greater understanding of the most applicable tools available for the management of shoulder patients. When we consider the different ways in which we can assess effectiveness of intervention in shoulder pathologies, naturally outcomes such as pain, Range of Motion (ROM) and strength come to mind. However, adapting a broader approach, incorporating overall physical, emotional and social functioning into assessment is recommended, as per the World Health Organization model of Functioning, Disability, and Health. 13 shoulder assessment questionnaires have been described with total score 130 [13].
Fig. (1): Scapular elevation and depression mobilization.

Fig. (2): Scapular retraction and protraction mobilization.

Fig. (3): Scapular upward and downward rotation.

Fig. (4): Pectoralis major release.
Results

1- General characteristics of patients:

Patients were assigned randomly into two equal study groups. Study group consisted of twenty female patients with mean age values of 44.25 ± 9.21 years, control group consisted of twenty female patients with mean age, values of 43.3 ± 9.28 years. As indicated by the independent t-test, there were no significant differences (p > 0.05) in the mean values of age between both tested groups (Table 1) and Fig. (8).

2- ROM of shoulder flexion:

As presented in (Table 2) and illustrated in Fig. (11), within group's comparison the mean ± SD.
values of ROM of shoulder flexion in the "pre" and "post" tests were 65.5 ± 6.46 and 173.75 ± 6.04 (138.1%) respectively in the study group. Multiple pairwise comparison tests (post hoc tests) revealed that there was significant increase of ROM of shoulder flexion at post-treatment in compare to pre-treatment (p-value=0.0001*).

Additionally, the mean ± SD values of ROM of shoulder flexion in the "pre" and "post" tests were 63.5 ± 12.57 and 136.25 ± 9.71 (114.5%) respectively in the control group. Multiple pairwise comparison tests (post hoc tests) revealed that there was significant increase of ROM of shoulder flexion at post-treatment in compare to pre-treatment (p-value=0.0001*).

3- **ROM of shoulder abduction:**

As presented in (Table 3) and illustrated in Fig. (12), within group's comparison the mean ± SD values of ROM of shoulder abduction in the "pre" and "post" tests were 68.5 ± 17.85 and 166 ± 10.2 (142.3%) respectively in the study group. Multiple pairwise comparison tests (post hoc tests) revealed that there was significant increase of ROM of shoulder abduction at post-treatment in compare to pre-treatment (p-value=0.0001*).

Additionally, the mean ± SD values of ROM of shoulder abduction in the "pre" and "post" tests were 70.5 ± 10.87 and 124 ± 14.29 (75.8%) respectively in the control group. Multiple pairwise comparison tests (post hoc tests) revealed that there was significant increase of ROM of shoulder abduction at post-treatment in compare to pre-treatment (p-value=0.0001*).

4- **Pain threshold:**

As presented in (Table 4) and illustrated in Fig. (13), within group's comparison the mean ± SD values of pain threshold in the "pre" and "post" tests were 4.93 ± 1.01 and 11.87 ± 1.27 (140.77%) respectively in the study group. Multiple pairwise comparison tests (post hoc tests) revealed that there was significant increase of pain threshold at post-treatment in compare to pre-treatment (p-value=0.0001*).

Additionally, the mean ± SD values of pain threshold in the "pre" and "post" tests were 4.96 ± 1.05 and 6.5 ± 0.76 (30.94%) respectively in the control group. Multiple pairwise comparison tests (post hoc tests) revealed that there was significant increase of pain threshold at post-treatment in compare to pre-treatment (p-value=0.0001*).

5- **Shoulder pain and disability index:**

As presented in (Table 5) and illustrated in Fig. (14), within group's comparison the mean ± SD values of shoulder pain and disability index in the "pre" and "post" tests were 89.29 ± 2.98 and 13.46 ± 1.72 (84.92%) respectively in the study group. Multiple pairwise comparison tests (post hoc tests) revealed that there was significant reduction of shoulder pain and disability index at post-treatment in compare to pre-treatment (p-value=0.0001*).

Additionally, the mean ± SD values of shoulder pain and disability index in the "pre" and "post" tests were 89.77 ± 3.37 and 49.27 ± 5.92 (45.11%) respectively in the control group. Multiple pairwise comparison tests (post hoc tests) revealed that there was significant reduction of shoulder pain and disability index at post-treatment in compare to pre-treatment (p-value=0.0001*).
Table (1): Physical characteristics of patients in both groups.

<table>
<thead>
<tr>
<th>Items</th>
<th>Study group Mean ± SD</th>
<th>Control group Mean ± SD</th>
<th>Comparison</th>
<th>Level of significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs)</td>
<td>44.25±9.21</td>
<td>43.3±9.28</td>
<td>0.325</td>
<td>0.747</td>
</tr>
</tbody>
</table>

*SD : Standard Deviation.

\( p \) : Probability.

\( S \) : Significance.

NS : Non-Significant.

Table (2): Mean values and \( p \)-values of ROM of shoulder flexion pre and post test at both groups.

<table>
<thead>
<tr>
<th>ROM of shoulder flexion</th>
<th>Pre test Mean ± SD</th>
<th>Post test Mean ± SD</th>
<th>MD</th>
<th>% of change</th>
<th>( p )-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study group</td>
<td>65.5±6.46</td>
<td>173.75±6.04</td>
<td>-90.5</td>
<td>138.1%</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Control group</td>
<td>63.5±12.57</td>
<td>136.25±9.71</td>
<td>-72.75</td>
<td>114.5%</td>
<td>0.0001*</td>
</tr>
<tr>
<td>MD</td>
<td>2.00</td>
<td>37.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( p )-value</td>
<td>0.531</td>
<td>0.0001*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* : Significant level is set at alpha level <0.05.

SD : Standard Deviation.

MD : Mean Difference.

\( p \)-value : Probability value.

Table (3): Mean values and \( p \)-values of ROM of shoulder abduction pre and post test at both groups.

<table>
<thead>
<tr>
<th>ROM of shoulder abduction</th>
<th>Pre test Mean ± SD</th>
<th>Post test Mean ± SD</th>
<th>MD</th>
<th>% of change</th>
<th>( p )-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study group</td>
<td>68.5±17.85</td>
<td>166±10.2</td>
<td>-97.5</td>
<td>142.3%</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Control group</td>
<td>70.5±10.87</td>
<td>124±14.29</td>
<td>-53.5</td>
<td>75.8%</td>
<td>0.0001*</td>
</tr>
<tr>
<td>MD</td>
<td>-2.00</td>
<td>42</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( p )-value</td>
<td>0.671</td>
<td>0.0001</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* : Significant level is set at alpha level <0.05.

SD : Standard Deviation.

MD : Mean Difference.

\( p \)-value : Probability value.
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**Table (4): Mean values and \( p \)-values of pain threshold pre and post test at both groups.**

<table>
<thead>
<tr>
<th>Pain threshold</th>
<th>Pre test Mean ( \pm ) SD</th>
<th>Post test Mean ( \pm ) SD</th>
<th>MD</th>
<th>% of change</th>
<th>( p )-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study group</td>
<td>4.93 ( \pm ) 1.01</td>
<td>11.87 ( \pm ) 1.27</td>
<td>–6.94</td>
<td>140.77%</td>
<td>0.0001 *</td>
</tr>
<tr>
<td>Control group</td>
<td>4.96 ( \pm ) 1.05</td>
<td>6.52 ( \pm ) 0.76</td>
<td>–1.535</td>
<td>30.94%</td>
<td>0.0001 *</td>
</tr>
<tr>
<td>MD</td>
<td>–0.03</td>
<td>5.375</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( p )-value</td>
<td>0.928</td>
<td>0.0001</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*: Significant level is set at alpha level <0.05. MD: Mean Difference. SD: Standard Deviation. \( p \)-value: Probability value.

**Table (5): Mean values and \( p \)-values of shoulder pain and disability index pre and post test at both groups.**

<table>
<thead>
<tr>
<th>Shoulder pain and disability index</th>
<th>Pre test Mean ( \pm ) SD</th>
<th>Post test Mean ( \pm ) SD</th>
<th>MD</th>
<th>% of change</th>
<th>( p )-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study group</td>
<td>89.29 ( \pm ) 2.98</td>
<td>89.77 ( \pm ) 3.37</td>
<td>–0.481</td>
<td>84.92%</td>
<td>0.0001 *</td>
</tr>
<tr>
<td>Control group</td>
<td>13.46 ( \pm ) 1.72</td>
<td>49.27 ( \pm ) 5.92</td>
<td>75.826</td>
<td>45.11%</td>
<td>0.0001 *</td>
</tr>
<tr>
<td>MD</td>
<td>–35.803</td>
<td>84.92%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( p )-value</td>
<td>0.636</td>
<td>0.0001 *</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*: Significant level is set at alpha level <0.05. MD: Mean Difference. SD: Standard Deviation. \( p \)-value: Probability value.

**Discussion**

Mastectomy (from Greek \( \mu \alpha \sigma \delta \varepsilon \) "breast" and \( \epsilon \kappa \tau \omicron \omicron \kappa \epsilon \tau \omicron \omicron \alpha \omicron \nu \omicron \omicron \alpha \omicron \ "cutting out") is the medical term for the surgical removal of one or both breasts, partially or completely. A mastectomy is usually carried out to treat breast cancer Lisa Newman [14].

Mastectomy is an operation which causes many changes in a woman’s body. Its consequence are, among other things, lymphatic edemas, limitation of movements and strength of the upper limb of the patient, experiences in the emotional sphere, difficulties related to the postoperative scar and the results of supplementing treatment such as radiotherapy or chemotherapy. Significant complications after mastectomy are changes in body posture caused both by disorders in body static as a result of amputation and limitation of movements and soreness of the spine Dobosz et al., [4].

Adverse changes in body posture of women after mastectomy in comparison with healthy women were found, manifested mainly in asymmetry of trunk and shoulder girdle and greater forward leaning of the trunk. Significant relationship was indicated between the operation of mastectomy and the asymmetry of position of scapula Sinai et al., [3].

The residual effects of surgery or radiotherapy also may affect the intricate shoulder girdle movements required for arm elevation. Normally, the humerus moves smoothly and in synchrony with respect to the scapula McClure et al., [15]. This scapulohumeral rhythm is achieved through precise muscle firing of scapulothoracic and scapulohumeral musculature in response to complex proprioceptive information, maintaining the head of the humerus within the glenoid fossa throughout the movement. The asymmetry of both soft tissue motility and mass distribution across the chest wall that arises from loss of a breast potentially could affect upper-limb movements and contribute to trunk or arm symptoms.

Shamley and Srinaganathan [16] has identified that significant changes during unilateral arm elevation in scapular kinematics on the operated side following surgery for breast cancer. In that study, however, the sample included women who had undergone mastectomy with or without radiotherapy, wide local excision with or without radiotherapy, or chemotherapy. In addition, participants included women with coexisting shoulder pain on the side of surgery, varying levels of shoulder morbidity following treatment for breast cancer have been reported. Patients report pain, weakness, tightness and reduced functional capacity.

Cheville and Tchou [17] changes in the size and activation of muscles around the upper trunk consequential to surgery for breast cancer and soft tissue contracture may result from protective posture and movement.
The purpose of the study is to determine the efficacy of scapular mobilization and muscle release in increasing the shoulder flexion and abduction range of motion after mastectomy.

This study included forty patients who had shoulder girdle dysfunction. Whose ages ranged from 35-65 years. The participants selected from Oncology Center (Ayady El-Mostakbal Center for Oncology in Alexandria), they were randomly distributed into two equal groups.

All patients in both groups were assessed before and after 12 weeks treatment program by using goniometer to measure shoulder flexion and abduction range of motion, pressure algometer to measure the pain threshold and shoulder pain and disability index to detect improvement of shoulder function.

Results showed that there was significant increase of shoulder flexion and abduction ROM post-treatment in both groups (more increase in study group), improvement of pain threshold and disability (more improvement in study group).

The results of our study are consistent with the work reported by the following:

Several studies also have proven the effectiveness of physical therapy programs, applied postoperatively on breast cancer patients with axillary lymph node dissection, on shoulder range of motion de Rezende LF et al., [18]. Pain Beurskens CH et al., [19], and shoulder function Cinar et al., [20]. The traditional physiotherapy programs aim to prevent the dysfunctions of the upper limb by performing a symptomatic treatment: i.e. passive and active shoulder and scapular mobilisations, stretching of pectoral muscles and exercise therapy to improve shoulder mobility and shoulder function and to decrease pain Devoogdt et al., [21].

Based on a project of multidisciplinary breast center, Zekinhuis Leuven university 2012/2016, The myofascial techniques aim to reduce the dysfunctions of the upper limb by performing a causal treatment, i.e. eliminating the myofascial dysfunctions. Myofascial techniques are manual techniques on the soft tissues and fasciae. These soft tissue manipulations proceed from the superficial layers into the deeper layers. There was resistance felt, the barrier is softly maintained until a release is felt. This approach is repeated until a soft end-feel is reached in every direction and layer. As long as these soft tissue restrictions are not restored, joint movement restrictions will reoccur. To our knowledge, scientific evidence for the application of myofascial release techniques to prevent dysfunctions of the upper limb within breast cancer patients is missing. Therefore, the first aim of our proposed project is to investigate the preventive effect of myofascial techniques, additional to the traditional physical therapy, on dysfunctions of the upper limb, applied on breast cancer patients with axillary lymph node dissection.

At long-term, a lot of breast cancer patients with axillary lymph node dissection suffer from dysfunctions of the upper limb. Patients with dysfunctions of the upper limb have a lower quality of life than patients not suffering from it. At 24 months post-axillary dissection, 58% of the breast cancer patients suffer from pain, 17% have impaired shoulder mobility, 50% have impaired shoulder function and 15% have arm lymphedema. Our pilot study revealed that one session of myofascial techniques decreased pain in the axilla and improved shoulder mobility (more than one session of active exercises).

Different side effect of breast cancer treatment, such as scar tissue and fibrosis of pectoral tendons and muscle sheets, may lead to biomechanical malalignment of the shoulder Stubblefield et al., [22] concluded that since myofascial techniques have an influence on muscle and fascia around the muscle, they also will change the alignment of the shoulder girdle.

Le Vu et al., [23] investigated the effect of passive mobilization after breast cancer treatment, comparing the following 4 groups: No physical therapy mobilization of the shoulder, massage of the arm, or both mobilization and massage. All interventions started the first day after surgery and lasted for 7 days. After discharge, patients went to a physical therapist of their own choice. Analysis after 7 days showed that the ROM was greater in the group that had massage and mobilization in comparison with that of the 2 other groups who had received massage only or no physical therapy at all. After 3 months, there were no differences between the groups. At long-term follow-up (24 months), significantly more locoregional pain was noted in the 2 groups without mobilization than the groups with mobilization.

On the other hand, the results of this study are inconsistent with the work reported by the following:

Maria Teresa et al., [24] proved that there was no significant difference in shoulder ROM and UL function between women receiving UL exercises followed by MT and those receiving UL exercises alone for rehabilitation after breast cancer surgery.
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Devoogdt et al., [21] reported that 31% of the women remained with impaired shoulder mobility. Furthermore, there is a scarcity of published data on functional impairment and the use of MT.

Conclusion:
On the basis of the results obtained in the present study, it can be concluded that scapular mobilization and myofascial release are valuable and effective methods in improving shoulder flexion and abduction ROM, pain threshold and disability for women suffering from shoulder girdle dysfunction post mastectomy.

References
4- DOBOSZ J., WOZNIEWSKI M. and MALICKA I.: "Oczenie: 
5- DOBOSZ J., WOZNIEWSKI M. and MALICKA I.: "Oczenie: 
6- D'IGIOVANNA, EILEEN; SCHIOWITZ, STANLEY; DOWLING and DENNIS J.; "Ch. 12: Myofascial (Soft Tissue) Techniques". An Osteopathic Approach to Diagnosis and Treatment (3 rd ed.). Philadelphia: Lippincott Williams & Wilkins, 2012.
فاعلية تعبئة كتفي والإطلاق الليلي العضلي على وظيفة حزام الكتف بعد إستئصال الثدي

أجرت هذه الدراسة على أربعين مريضاً يعانون من تغييرات في وظيفة حزام الكتف بعد عملية إستئصال الثدي وكان متوسط العمر من خمسة وثلاثين سنةً وستون سنةً تم تقسيمهم إلى مجموعتين متساويتين: المجموعة الأولى (أ) والمجموعة الثانية (ب).

المجموعة الأولى: تتكون من عشرون مريضاً تلقوا أربعة وعشرون جلسة من العلاج (جلستان في الأسبوع نتيجة للجلسة خمسة وأربعون دقيقة).

في صورة تعبئة كتفي والإطلاق الليلي للعضلات بالإضافة إلى تمارين رياضية لفصل الكتف.

المجموعة الثانية: تتكون من عشرون مريضاً تلقوا أثنتي عشر أسابيع من التمارين الرياضية لفصل الكتف فقط (جلستان أسابيعاً لمدة عشر دقائق وتكير كبرينامج تدريبات مرتين خمس مرات يومياً وتكير عشرة مرات في كل مره).

الطريقة القياس: تم قياس نسبة التحسن ووظيفة فصل الكتف قبل الدراسة ثم بعد أثنتي عشر أسابيع (نتيجة للعلاج) لكل المجموعتين باستخدام المقابل لقياس زوايا (المدى الحركي لاثنتي الكتف والمدى الحركي لرفع فصل الكتف جانبياً)، مقياس التبان لقياس مقدار تحمل ضغط الألم، ومؤشر الألم والعجز قبل وبعد العلاج لقياس نسبة التحسن في وظيفة فصل الكتف.

أظهر النتائج وجود تحسن في المجموعة الأولى في تطبيق تعبئة كتفي وإطلاق العضلات بالإضافة إلى التمارين الرياضية لفصل الكتف والمجموعة الثانية بإستخدام التمارين الرياضية لفصل الكتف على وظيفة فصل الكتف ودرجة تحمل الألم ولكن نسبة التحسن كانت محدودة.

والأخير، بشكل كبير على المجموعة الأولى.

الاستنتاج:
- كلاً من العلاج بتطبيق تعبئة كتفي وإطلاق العضلات بالإضافة إلى التمارين الرياضية لفصل الكتف وسائل فعالة لتحسين وظيفة فصل الكتف بعد عملية إستئصال الثدي.
- تطبيق تعبئة كتفي وإطلاق العضلات وسيلة أكثر فاعلية لتحسين وظيفة فصل الكتف بعد عملية إستئصال الثدي.