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Effect Of Myofascial Release in Combination with Muscle Energy Techniques on Axillary Web Syndrome in Post Radical Mastectomy Breast Cancer Patients

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Key Words

Breast cancer, lumpectomy, mastectomy, myofascial release

Abstract

In the early stages of breast cancer, surgery is often the first choice for treatment. It can also be used as an extra treatment in the later stages. A few of the many surgeries used to treat breast cancer are sentinel lymph node biopsy (SLNB), lumpectomy, and surgical intervention mastectomy (MRM). After a modified radical mastectomy to axillary dissection of the lymph nodes (ALND), a woman's shoulder range of motion is greatly reduced (ROM). There are various physiotherapy treatment modalities, therapeutic exercises, manual therapies which include massage; myofascial release techniques and manual lymphatic drainage which need to be performed over an average period for three weeks to six months. These techniques are found to be effective in releasing the taut fibrous cord, improving the shoulder range of motion and tissue mobility.

1. Introduction

Breast cancer is considered to be one of the most prevalent cancers with 2, 10,801 cases reported in 2020.It is commonly seen in women's and is the second leading cause of cancer mortality. In India, infiltrating lobular type of breast carcinoma accounts for 2% - 7% and mucinous carcinoma forms 2% - 3% of breast cancer. [6] Commonest breast cancer treatment includes various surgeries, radiation therapy, and chemotherapy, anti HER2 / treatment and hormonal therapy. [1] In the early stages of breast cancer, surgery is often the first choice for treatment. It can also be used as an extra treatment in the later stages. A few of the many surgeries used to treat breast cancer are sentinel lymph node biopsy (SLNB), lumpectomy, and surgical intervention mastectomy (MRM). In patients with axillary lymph node involvement, MRM is recommended. Axillary dissection can cause a considerable amount of morbidity in the patients. [2] Some side effects are linked to the different ways to treat cancer. After a modified radical mastectomy to axillary dissection of the lymph nodes (ALND), a woman's shoulder range of motion is greatly reduced (ROM).

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Axillary Web Syndrome is a side effect of axillary dissection of lymph nodes or axillary surgery that causes fibrotic bands or cords to form in the axilla and arm. This happens most often in people who have had the axillary lymph node dissection or axillary surgery[11] that are commonly performed in breast cancer patients. It is a clinical syndrome characterized by palpable cord soft issue like a band. In the patients who have undergone surgical procedure for breast cancer. The adhesion formed in the cords and the surrounding tissues contribute to impaired shoulder mobility. [3] Cords or webs generally emerge in first few weeks following surgery although they can appear later. [5] In non-surgical patients of breast cancer, AWS presents with linear skin changes along with band-like fibrous structure on palpation. [4] The cords or webs generally emerge in the first few weeks following surgery although they can appear later. There are various physiotherapy treatment modalities including therapeutic exercises, manual therapies which include massage; myofascial release techniques and manual lymphatic drainage over an average period for three weeks to six months are found to be effective in releasing the taut fibrous cord, improving the shoulder range of motion and tissue mobility. MFR which is a soft tissue technique is found to have an optimistic effect on pain relief which is commonly seen in AWS. Gentle passive range of motion exercises are performed before beginning with release by holding the point of restriction for few seconds .[7]
However, there is paucity in literature stating effect of myofascial release in combination with muscle energy technique in adjunct on axillary web syndrome in postoperative breast cancer patients.

2. Materials and Methods

Experimental study was conducted of pre-test and post-test design among 45 patients operated for breast cancer. Institutional ethical approval was obtained from “Krishna institute of medical sciences deemed to be university, Karad”. Patients coming to out-patient department and those who visited radiation unit, Krishna institute of medical sciences deemed to be university, Karad were included using non-probability purposive sampling technique. Informed consent was obtained from each research participant and patient information sheet was provided to them. Materials used were goniometer for the assessment of ranges of neck and shoulder. Certain scales were used such as SPADI for pain and disability of shoulder, NDI for disability of neck, FACT-B for assessing quality of life. Muscle length assessment of pectoralis major and latissimus dorsi was done with manual evaluation technique. Assessment was done using these outcome measures pre and post interventions. For evaluation of AWS patient were taken in supine lying position with shoulder abducted, extended and laterally rotated with elbow extended and supinated and wrist and fingers extended. A slight skin traction was applied over the operated side extremity to palpate the cords and determine its location. Objective evaluation of AWS was done by assessing: length, width, size, depth and the number of palpable cords. Exercise Protocol:
Hot moist pack was given for the duration of 10 minutes prior to the intervention.(Figure-1)
After which MFR was given with patient in supine lying with same position which was used for assessment of AWS. It was given for the duration of 90-120 seconds over the palpable axillary cord on alternate days per week for four weeks. Participants were instructed to gently bend their arms and move them out to the side with their hands resting on the wall. They were then told to move to the juncture of tension & hold that position for 3–5 seconds before letting go of the cord.
MET was given for short pectoralis major muscle, latissimus dorsi, upper trapezius, supraspinatus and subscapularis. For MET of pectoralis major as well as latissimus dorsi, the patient was put on his back with his arm bent in a way that shows pectoral shortness most clearly. With less abduction (up to about 45°), the clavicular fibers are more important. Between such two extremes is a position that affects the sternal fibers. This position is followed by a 30 second stretch hold and a 10 second rest. The treatment was repeated three times in one session two times a week for a period of four weeks. For Pectoralis major muscle the patient was asked to use light resisted effort (20% of available strength). The patient was instructed to use mild degree of effort with no pain.
The contractility was held for about 10 seconds, and when the practitioner let go of all effort, the head and neck were gently bent and rotated to the side and held there while the shoulder was stretched backward. After stretching the muscle, the patient was told to relax, and the stretch was held for 10–30 seconds.
For the supraspinatus, the therapist sat behind the seated patient and had one hand on the shoulder on the side to be treated. The other arm was placed in front of the patient to endorse the bent elbow and

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forearm. The patient's upper arm was moved out to its easy limit, and the physician was instructed to bring the arm back in using 20% of his or her strength against the resistance of the practitioner. After a 10-second isometric contraction, the patient's arm was moved gently toward its new resistance barrier to bring it closer to the body. For each stretch that didn't hurt, you were told to hold it for at least 20 seconds.

For the MET for the subscapularis muscle, the patient was put in a supine position with the arm 90° away from the body, the elbow 90° bent, and the palm of the hand facing up. The patient was asked to raise their forearm mildly for minimal resistance from of the practitioner for 7–10 seconds. After that, they were told to relax and let gravity or a little help from the operator move their arm through the barrier and into a position where they could hold it for at least 20 seconds.

After a period of 4 weeks post evaluation was done using outcome measures. Data was collected then interpreted by statistical analysis to rule out the results.

3. Results

Data was collected from excel sheet using Windows SPSS program,V10 was used to perform statistical interpretation. The non-parametric method was used for descriptive analysis because the normality test did not pass. The Wilcoxon test was used to look at the differences between Axillary Web syndrome before and after the intervention. Data presented in [Graph 1] depict age wise distribution of samples. About 33% of the patients were of age group 41-50 years. There were 97% patients who had received chemotherapy [Graph 2].

TABLE 1: Comparison Of Pretest And Posttest Pectoralis Major And Latissimus Dorsi Muscle Length

Parameters	Pre / Post test	Mean	SD	Mean Diff.	SD Diff.	p-value
Pectoralismajor	Pretest	10.86	1.28	2.93	1.25	<0.0001
	Posttest	7.93	1.39			
Latissimus dorsi	Pretest	12.84	1.26	3.94	1.22	<0.0001
	Posttest	8.90	1.73			

Interpretation: The pre and posttest values of Pectoralis major and Latissimus dorsi muscle length was compared by applying Wilcoxon matched paired test. It was concluded that the interference of p value is very significant with value of <0.0001.

TABLE 2: Comparison Of Pretest And Posttest Neck Disability Index Scores (Ndi)

Pre/post test	Mean	SD	Mean Diff.	SD Diff.	t-value	p-value
Pretest	26.67	6.61	13.07	6.05	5.8413	<0.0001
Posttest	13.60	8.19				

Interpretation: Comparison of pretest and posttest of Neck Disability Index scores was done by using dependent t test. P value of < 0.0001 was obtained , which is considered as highly significant.

TABLE 3: Comparison Of Pretest And Posttest Of Shoulder Pain And Disability Index (Spadi)

Pre/post test	Mean	SD	Mean Diff.	SD Diff.	% of change	t-value	p-value
Pretest	10.33	11.00	57.09	16.08	54.20	23.8091	<0.0001
Posttest	48.24	17.88					

Interpretation: Comparison of pretest and posttest SPADI scores by dependent t test .p value of < 0.0001 was obtained ,which is considered as highly significant.

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TABLE 4: Comparison Of Pretest And Posttest Scores Of Range Of Motion Parameters

ROM Parameters	**Pre/Post test**	**Mean**	**SD**	**Mean Diff.**	**SD Diff.**	**p-value**
Cervical flexion	Pretest	35.78	5.33	-12.89	4.83	<0.0001
	Posttest	48.67	3.27			
Cervical extension	Pretest	47.56	7.73	-16.78	8.74	<0.0001
	Posttest	64.33	9.27			
Cervical lateralflexion	Pretest	18.71	2.28	-14.40	5.67	<0.0001
	Posttest	33.11	5.77			
Cervical rotation	Pretest	43.78	4.42	-18.56	8.64	<0.0001
	Posttest	62.33	9.08			
Shoulder flexion	Pretest	152.00	17.85	-21.33	12.17	<0.0001
	Posttest	173.33	12.43			
Shoulderextension	Pretest	44.44	5.56	-5.33	5.48	<0.0001
	Posttest	49.78	1.04			
Shoulder abduction	Pretest	150.33	25.01	18.67	4.28	<0.0001
	Posttest	169.00	17.57			
Shoulder internal rotation	Pretest	66.11	10.44	-10.67	7.35	<0.0001
	Posttest	76.78	8.99			
Shoulder external rotation	Pretest	83.33	9.17	-6.89	.60	<0.0001
	Posttest	90.22	7.46			
	Posttest	13.60	8.19			

Interpretation:

Cervical flexion, extension, lateral flexion, rotation shows significant p value 0.0001 and shoulderflexion, extension, abduction, internal rotation and external rotation also shows better improvement in combination of MFR and MET.

TABLE 5: Comparison of Pretest And Posttest Fact - B Scores

Times	Mean	SD	Mean Diff.	SD Diff.	% of change	Z-value	p-value
Pretest	91.60	6.59	47.89	15.67	52.28	5.8414	0.0001*
Posttest	43.71	16.29					

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Interpretation: "Comparison of pretest and posttest FACT-B scores was done by using dependent t test .p value 0.0001 was obtained which is highly significant."

4. Discussion

The goal of this study was to find out how MFR and MET affect Axillary Web Syndrome and the way it helps with pain, range of motion, and life satisfaction in women who have had surgery, chemotherapy, or radiation therapy for breast cancer. Deep tissue massage is a type of manual therapy for soft tissues that is based on the idea that soft tissues should be loaded biomechanically. Fascia is a tri network of structures that mostly wraps around and supports the body's muscles. When fascia is tight, it can make the body as well as its soft tissue constructions feel more pressure and stress, which can cause pain and dysfunction. This study was based on previous work by Datar, Nirmiti.A et.al. [8] in which It has been shown that Myofascial Release is a better way to treat Axillary Web Syndrome than stretching in terms of pain, range of motion, and disability in the arm, shoulder, and hand. In this study, there were two groups. One was treated with myofascial release, and the other was stretched for 4 weeks. VAS, DASH, and Goniometry were all used to measure before and after. Moreover, Pilar Serra-Ano et.al. [9] determined the effectiveness of myofascial release in women who opted for conservative surgery and radiotherapy. Four weeks treatment was given patients were divided into two groups one group received Myofascial release while the another received placebo manual lymphatic drainage, the outcomes studied were pain, shoulder range of motion and general quality of life using FACT-B. This study concluded to be beneficial on overall shoulder movement, functionality and perceived pain in women after breast cancer surgery.

Muscle Energy technique (MET) is another manual therapy technique which involves active participation of patient and is based on principle of painlessness.[14] MET is beneficial in improving the muscle strength, flexibility, muscle length and stability. The study by Yanan Jin Jingxin Wang et.al.[10] concluded that "early functional training along with MET can promote the recovery of upper limb dysfunction after breast cancer surgery. The outcome measure used was shoulder range of motion using goniometer. Axillary web syndrome is clinically associated with pain and limited range of motion of the affected shoulder"[12]. Axillary Web syndrome persists with pain and significant functional limitation of the ipsilateral upper limb.[13] There is evidence present upon the effect of myofascial release which is individually proven to improve range of motion and pain in AWS. On the other hand effect of muscle energy technique which has significant improvement in the upper limb function in post-operative patients. In this aspect the present study evaluated the combination of both the manual techniques on axillary web syndrome in post-operative breast cancer patients.

5. Limitations

There were several limitations of the present study. It is unclear when to approach these patients, as the development period of axillary web syndrome varies depending on the treatment received after surgery (chemotherapy, radiation therapy, or a combination of treatments). The study duration of the intervention which was limited to a short period of time, the long-term effects of these exercises were not recorded. Another limitation was that the study was confined to a specific geographical area .Thus further studies can be carried out with larger population and longer intervention span to determine the long-term effects.

6. Conclusion

This study showed a mark able decrease in the disability levels while assessed with the help of Neck Disability Index. There was a remarkable decrease in the disability levels of the shoulder and improvement in shoulder range of motion and quality of life among these patients.

Hence this study proved that the best management approach involves the combination intervention of the effect of muscle energy technique along with myofascial release on axillary web syndrome in post radical mastectomy breast cancer patients.

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The authors certify that they have obtained all appropriate patient consent."

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Conflicts of Interest

NIL

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