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REHABILITATION IN POST-CHEMOTHERAPEUTIC UNSTABLE ARTHRITIC SHOULDER- A CASE REPORT

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ABSTRACT

Post-chemotherapy shoulder complications are common. They result in long term functional impairment and disability. The following case is of a woman who was diagnosed with bilateral shoulder joint arthritis (Right>left) post lumpectomy of the left breast. Her symptoms started a year after she was put on anastrozole. Patient started complaining of multiple joint pains involving the shoulder joints, bilateral hip and knee. She was asked to undergo shoulder replacement if disability persisted. Physiotherapy was suggested and she was treated with aggressive strengthening both for treating pain and improving function. Post treatment patient gave a visual analogue score of 6 on 10 on the right and 5 on 10 on the left as compared to pre-treatment scores of 8 on 10 bilaterally. Patient now had mild difficulty in cooking as compared to moderate previously and moderate difficulty in overhead activities, making bed, grooming and dressing. There was a subjective improvement of 50% in the activities of daily living which was previously not being done or severely limited. Considering the above findings strengthening can be cautiously suggested for improving function in patients with breast cancer on chemotherapy.

Keywords: cancer, arm and function

INTRODUCTION

Breast cancer is now becoming one of the most common causes of death in females from developing countries.¹ Treatment of breast cancer involves a host of modalities namely; pharmacological, radiotherapy and surgery.² Surgical procedures include mastectomy and breast conservation surgery (lumpectomy). Lumpectomy is done in early breast cancer cases and may be accompanied by removal of lymph nodes. In lumpectomy the tumor is resected along with small amount of surrounding unaffected tissue. This procedure is generally followed by chemotherapy and radiotherapy

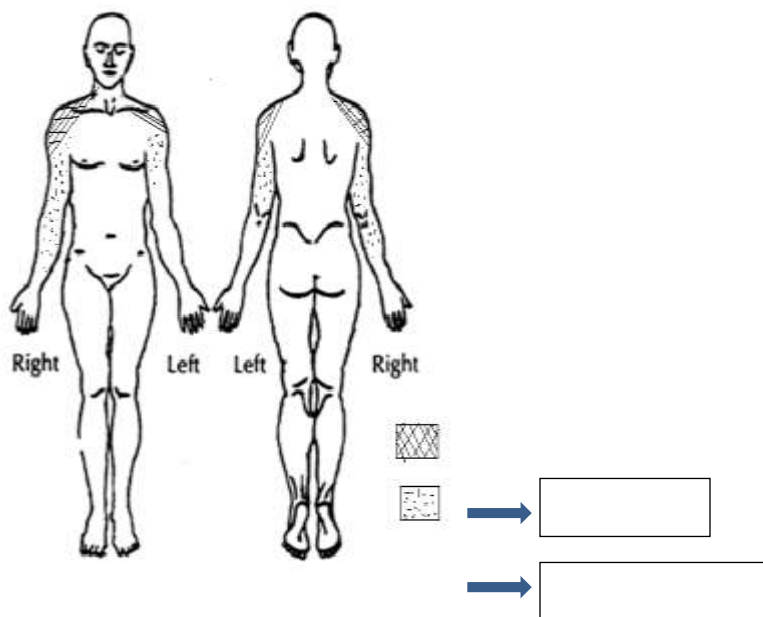
especially if there is involvement of lymph nodes.³ Chemotherapy has been shown to reduce recurrence of breast cancer and improve survival rates in hormone receptor dependent breast cancer.⁴ Chemotherapy has been associated with various complications. Shoulder disability due to pain and dysfunction is a common complication of treated early breast cancer cases.⁵ Pain in these cases is multifactorial.³ Shoulder pain and dysfunction may be due to surgery especially if it involves lymph node excision or chemotherapy. Among chemotherapy options Aromatase Inhibitors (AIs) have been found to improve disease free survival when used as an adjuvant hormonal therapy but patients put on AIs have shown a higher incidence of joint pains and

myalgias. These symptoms in most cases last till the patient is on therapy and subside thereafter and no association has been found between pain induced due to AIs and arthritis.^{6,9} There are a wide range of physical and pharmacological treatment options that can be given to patients who are on adjuvant therapies to manage the effects associated with breast cancer and its treatment. Studies have discussed in detail management of breast cancer with exercise therapy in general and found a positive influence of physical activity on physical function and psychology.^{2,7} The following report is a case of a lady who had undergone a lumpectomy and was still on anastrozole which is an Aromatase Inhibitor. She complained of joint related symptoms but also had coexisting ultrasonographic changes consistent with arthritis and showed signs of shoulder instability. Our aim was to find out if strengthening and lifestyle changes improved symptoms associated with AI administration in a lady having co-existing osteoarthritis and shoulder instability. We hypothesized that the pain arising from the shoulders was typically AI induced, exacerbated an already existing arthritis and would improve when managed with exercises.

History:

A 67 year old lady visited the physical therapy department with a complaint of pain in bilateral shoulder joint right more than left and difficulty in doing overhead activities. Pain started 3 years back first in the left and then in the right shoulder. An ultrasound examination showed right supraspinatus calcific tendinitis and right subscapular tendinitis with gross joint effusion. A bone scan done at the same time showed changes suggestive of arthritis. The patient visited the author's outpatient department a week later. She presented with continuous sharp pain more in the right shoulder, which was deep in nature accompanied by dull aching pain in the arm and forearm. Pain in bilateral shoulders measured 8 on a 10 point visual analogue scale, was aggravated by shoulder movements and relieved by cessation of activity and rest. The patient also complained of a feeling of instability and a clicking sound on all the shoulder movements. The patient complained of moderate difficulty in cooking and an inability to do overhead activities such as taking objects from the closet above shoulder level and drying clothes. She had severe difficulty in upper body dressing, grooming and making her bed.

Figure 1: Body Chart



Past history:

Four years ago the patient underwent a lumpectomy of the left breast followed by local radiotherapy over a period of two months. The radiotherapy was followed by four cycles of chemotherapy with cyclophosphamide and docitaxel. A year after the surgery she approached a physician with symptoms of pain in the left shoulder and left knee during which she was diagnosed as having multidirectional instability of the left shoulder with secondary osteoarthritis. The right shoulder started showing symptoms a year after she was put on anastrozole. Physiotherapy was taken for the same which consisted of moist application, self-assisted shoulder mobilization and static quadriceps for knee with partial relief in symptoms. The patient was a known case of hypertension and diabetes with good glycemic control as shown by routine blood investigations and she was on amlodipine, metformin and

nabivolol as well as calcium and vitamin B supplementation.

Recreational and personal history:

The patient had been a recreational badminton player till her late 40's. She gave a family history of early onset of osteoarthritis. Her left shoulder was lax and had subluxed on many occasions and she had relocated it on her own. The patient admitted to having restricted her social activities since the surgery. She complained of lack of appetite, fatigue and projected a negative outlook towards life in general and treatment in particular.

Physical Examination:

On observation the right shoulder was found to be depressed. Atrophy of all three fibers of deltoid, supraspinatus and infraspinatus was noted. Hollowing of supraclavicular and infraclavicular fossa bilaterally was also seen. On palpation of the shoulder joint margins tenderness was elicited. Tenderness was also noted in the muscles of the upper arm and

forearm bilaterally. The sulcus sign was present. Cervical range of motion was full and painless in all directions. Beighton's criteria for hypermobility showed a score of 1 out of 9. Sensory testing over the upper limb dermatomal area was normal and active range of motion was grossly limited in all directions with extension being better than all other ranges. Active movement was accompanied by apprehension, a clicking sound and altered scapulohumeral rhythm which was predominant on the left due to a greater available range of motion. Initiation of movement was difficult. Winging was present bilaterally on doing a wall push up. A faradic-galvanic test was done to rule out any local motor nerve lesion. No other special tests were done. Consent form was understood and duly signed by the patient.

Treatment:

Day1- day 10

1. Electrical stimulation was started for the deltoid (all three fibres), supraspinatus and infraspinatus.
2. Gentle low load muscle setting exercises for rotator cuff and deltoid was initiated in supine. Initially 2 sets of 10 repetition was started and progressed to 3 sets of 10 repetition each.
3. Scapular strengthening was started as retraction exercises using thera tube
4. Core strengthening was started with training for transverse abdominis activation.

No significant post treatment soreness was observed.

Day 11- 3 weeks

1. Rhythmic stabilization was initiated using medicine ball against the wall for mediolateral and anteroposterior direction
2. Wall push ups were instituted
3. Eccentric exercises for shoulder flexion and abduction in supine and sitting respectively

were started up to 90° as free exercises and subsequently with half kilogram weight.

4. Alternating isometrics were given at different ranges of flexion within pain free range
5. Shoulder isometrics were continued
6. End of two weeks rhythmic stabilization was started in ranges where poor motor control was demonstrated.

3 weeks onwards:

After 2 weeks the patient was given a home program after supervising the exercises to be done in two sittings.

1. Isometric strengthening submaximal intensity was given against the wall
2. Wall push ups were continued
3. Pulley exercises with one kilogram weight were given up to 90° flexion and abduction in standing. A makeshift simple pulley was set up in the patient's home environment to enable her to continue these exercises.
4. One kilogram weight was given for rotator strengthening with focus on external rotators in side lying. A follow up was done after one month and the prescribed load was increased by half kilogram.

The protocol given above was applied only on the right shoulder and left shoulder was treated with conventional treatment consisting of isometrics and moist packs in the initial stages followed by strengthening with weighted pulleys.

Post treatment Examination:

Post treatment the patient gave a visual analogue score of 6 on 10 on the right and 5 on 10 on the left as compared to pre-treatment scores of 8 on 10 bilaterally. Patient now had mild difficulty in cooking as compared to moderate previously and moderate difficulty in overhead activities, making the bed, grooming and dressing. There was a subjective improvement of 50% in the

activities of daily living which was previously not being done or severely limited.

Table 1: Pre and Post treatment range of motion

Shoulder range	Pre Right	Post Right	Pre Left	Post Left
Flexion	0-80 °	0-120 °	0-120 °	0-130 °
Extension	0-40 °	0-40 °	0-40 °	0-40 °
Abduction	0-60 °	0-90 °	0-90 °	0-90 °
External rotation	0-30 °	0-40 °	0-60 °	0-80 °
Internal rotation	0-70 °	0-80 °	0-80 °	0-80 °

Table 2: Manual Muscle testing results before and after treatments was as follows

Group muscle (shoulder)	Pre Right	Post Right	Pre Left	Post Left
Flexors	1+	3+	1+	3+
Extensors	3	3+	3	3+
Abductors	1+	3+	1+	3+
External rotators	1	2+	3	3
Internal rotators	3+	4	4	4

DISCUSSION

Post-treatment results showed improvement in both strength and range of motion in both the shoulders. There was a reduction in pain as measured on visual analogue scale. Our patient had more symptoms of the shoulder on the opposite side of breast surgery. Shoulder disability on the side of breast surgery has been previously observed and documented⁵. Pain in the operated side shoulder has been positively correlated with chemotherapy although no significant correlation was found with radiotherapy exposure.⁸We hypothesized that the severe symptoms on the uninvolved side shoulder might have been due to already existing arthritis which was exacerbated by AI induced arthralgia.⁹This has been known to occur due to depletion in estrogen levels due to AI.⁹One study stated that previous chemotherapy and treatment with anastrozole were major risk factors for development of joint disorders.¹⁰Evidence also shows that rotator cuff

muscle weakness is a direct consequence of breast cancer and instability can occur as a result of its fatigue or failure to stabilize.^{11,12}This explains the dynamic instability noted in this case.

Cervical radiculopathy, rotator cuff tendinitis, arthritis and complex regional pain syndrome are few of the common complications of breast cancer and its treatment.¹¹Bone metastasis were ruled out by quarterly mammography and bone scan. Cervical radiculopathy was ruled out on cervical examination and so was complex regional pain syndrome (CRPS) as most of the mandatory criteria for CRPS were not fulfilled. Patient satisfied all criteria of articular pain which included instability, crepitation and pain on shoulder movement.^{9,13}Considering this as a case of AI induced arthralgia with shoulder joint arthritis and instability caused due to rotator cuff weakness; we commenced her treatment with electrical stimulation as the first line of treatment. Electrical stimulation can have

an analgesic effect and is effective in gaining early ranges of motion¹⁴ in patients having problem initiating movement.¹⁵ Isometrics were started to prevent further atrophy and reflex inhibition that was a major factor in decreased active range.¹⁶ Rhythmic stabilization was given to improve joint stability and neuromuscular control during active movements.^{16,17} Scapular strengthening was started to enhance the distal component to work on a more stable proximal component. This was followed by rotator cuff strengthening to improve dynamic control and endurance, enough to suffice for daily activities.¹⁶ Painful eccentric strengthening has been proved to be effective for severe chronic subacromial impingement cases.¹⁸ The authors thought of trying the same for this case since she had a problem in eccentric control. Along with the above, the patient was given feedback on the progress, advice on posture and ways to deal with her negative thoughts.

Clinical Message:

The results of this case report imply that a combination of isometric and isotonic strengthening can help in short term gain in strength and lost range of motion in breast cancer patients who were/are on chemotherapy. Further research can focus on long term effects of strengthening.

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