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SEVERE LYMPHEDEMA OF THE ARM AS A POTENTIAL CAUSE OF SHOULDER TRAUMA

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ABSTRACT

The aim of this study was to determine whether lymphedema of the arm is associated with traumatic injury to the shoulder and to assess the role of lymphatic physiotherapy in reducing disabling shoulder pain. The study group consisted of 10 women aged 58-81 years (mean 66.9) with arm lymphedema after surgery for breast cancer. The average interval between the operation and the appearance of lymphedema was 9.8 years. All patients complained of shoulder pain. Five patients had a tear in the supraspinatus muscle diagnosed by ultrasound examination, and 5 had chronic bursitis; the nonaffected arm showed no pathology. The mean volume of the affected arm was 568 ml greater. Treatment consisted of manual lymphatic drainage and intermittent sessions of pneumatic compression with the LymphaPress device. This led to an average decrease in arm volume of 170 ml, with improvement of arm mobility and a drastic reduction in shoulder pain.

In conclusion, lymphedema of the arm can cause severe shoulder trauma, pain and disability. Proper physiotherapy can reduce these effects. Patients should be referred for early treatment and follow-up to avoid permanent damage to the shoulder muscles.

Arm lymphedema is a distressing and unpleasant complication of mastectomy, with a reported incidence of 15-30% following modified radical mastectomy, and 2.1-3.1% following lumpectomy and axillary dissection. The highest rates are associated with axillary radiotherapy, extensive lymphadenectomy, and pathologic nodal status (1,2).

Long-term experience has shown that patients with chronic arm lymphedema often complain of shoulder pain (3). The aim of the present study was to determine whether lymphedema of the arm after breast surgery is associated with traumatic injury to the shoulder and to assess the role of lymphatic physiotherapy in reducing disabling shoulder pain.

PATIENTS AND METHODS

The study group included all patients referred for physiotherapy treatment for arm lymphedema following breast surgery for cancer from January 2002 to May 2003. The two arms of each patient were compared for findings on ultrasound of the shoulder and arm muscles. Mobility was determined by angle of rotation, and volume difference was measured (4). The patient rated shoulder pain on a subjective 10-point scale.

RESULTS

Fifty-two women were referred for physiotherapy after breast surgery during the study period, of whom 10 had lymphedema causing severe shoulder pain and functional

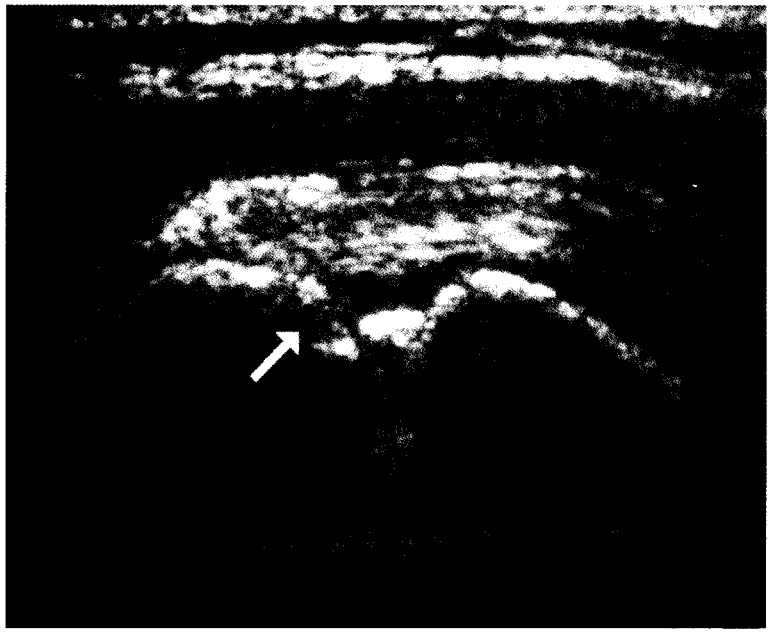

Fig. 1: Ultrasound demonstrating supraspinatus muscle tear.

Fig. 2: Rotator cuff anatomy showing typical sites of supraspinatus (arrowhead) and subscapularis (arrow) tendon/muscle trauma.

disability. Age range of this subgroup was 58-81 years (mean 66.9). Six were after lumpectomy and axillary dissection and radiotherapy, and 4 were after modified radical mastectomy. The average interval between surgery and the appearance of lymphedema was 9.8 years. Five patients were found to have a tear in the supraspinatus muscle on ultrasound scan, and 5 had chronic bursitis *(Figs. 1-2)*. Ultrasound of the contralateral shoulder revealed no abnormalities. The difference in arm volume between the affected and nonaffected sides ranged from 82 to 1367 ml (mean 568 ml). Average pain score was 7.6 (range 6-9). Treatment consisted of manual lymphatic massage and fortnightly sessions with the Lympha-Press device (5,6) for an average of 4.9 months. Following physiotherapy, the difference in arm volume decreased by 88 to 342 ml (mean 170 ml), and pain score dropped to an average of 2.7 (range 0-5). There was functional improvement in all cases (*Table 1*).

TABLE 1
Patient Characteristics Pre- and Post-Treatment

Case No.	Sex/Age (yrs)	Cause Duration	US findings	Pre-TR Clinical Findings Motion/Pain*	Pre-TR Lymphedema Volume (ml)**	Duration and Number of TR	Post-TR Clinical Findings Motion/Pain	Limb Volumes Pre/Post Difference (ml)
1	F/65 Lt	Lumpectomy +AD - 10 mos	Lt SS tendon edema. Rt normal	140° / 8	303	3 mos 2 per week	180° / 2	2212/2070 142
2	F/51 Rt	Lumpectomy + AD - 10 yrs	Rt bursitis. Edema biceps tendon. Lt normal	130° / 7	235	3 mos 3 per week	160° / 4	3017/2872 145
3	F/63 Lt	Lumpectomy + AD - 17 yrs	Lt fibrotic SS tendon, chronic bursitis. Rt normal	150° / 7	592	3 mos 2 per w - 2 mos 1 per w - 1 mo	180° / 0	3066/2795 271
4	F/73 Lt	Lumpectomy + AD - 4 yrs	Lt SS tear, chronic tear. Rt normal.	150° / 9	125	3 mos 2 per week	170-180° / 4 95	2827/2732
5	F/61 Rt	Lumpectomy + AD - 3 yrs	Rt tear SS. Lt normal	100° / 7	1007	6 mos 2 per week	160° / 5 improved funct.	3379/3037 342
6	F/58	Lumpectomy + AD = 6 mos	Lt Tendonitis biceps. Rt normal	160° / 8	82	6 mos 2 per week	170° / 0	2471/2383 88
7	F/58 Lt	Mastectomy + AD - 9 yrs	Lt dislocation distal clavicle. Calcified SS Tendon. Rt normal	180° / 8	351	4 mos 2 per week	180° / 6	2204/2711 107
8	F/80 Lt	Mastectomy + AD - 13 yrs	Lt SS tear micro tenditis. Rt SS tear micro	170° / 8	462	3 mos 2 per week	170° / 4 improved funct.	1807/1740 67
9	F/81 Lt	Mastectomy + AD - 26 yrs	Lt chronic bursitis. Rt normal	100° / 8	1155	12 mos 2 per week	180° / 0	2760/2513 247
10	F/81 Lt	Mastectomy + AD - 15 yrs	Lt SS tear. Rt normal	160° / 6	1367	6 mos 2 per week	180° / 2	3958/3754 204

AD=axillary dissection; US=ultrasound; TR=treatment; *=Scored on scale of 1-10; **=(affected-unaffected) limb volume.

DISCUSSION

Despite increased use of breast-conserving surgery, lymphedema (defined as an increase of over 200 ml in arm volume) after breast surgery is not dramatically changed (7,8). Arm lymphedema can also affect shoulder function (9). When the arm is in a resting position of adduction and neutral rotation, the position of the supraspinous tendons predisposes them to constant pressure from the humeral head, which leads to ischemia of the muscle (10,11). As lymphedema develops, the arm weighs more. Some patients compare the feeling to carrying a heavy load on that arm for days. This raises the pressure on the rotator cuff, causing pain, bursitis, and tendinitis. In some cases, it leads to chronic injury with ischemia and tearing of the supraspinatus muscle.

In our study, 20% of the women who were referred to the physiotherapy institute after breast surgery with lymphedema of the arm had associated severe pain and functional disability. A rotator cuff tear was found in 5 patients and chronic bursitis in 5. The difference in volume from the contralateral extremity was 568 ml (range 125-1267 ml). Physiotherapy treatment led to an average decrease in arm volume of 170 ml. In all cases, functional ability improved, and pain decreased dramatically.

In conclusion, lymphedema of the arm can cause severe shoulder trauma, pain and disability. Proper physiotherapy can reduce these effects. Patients should be advised of the consequences of lymphedema and referred for early treatment and follow-up to avoid permanent damage to the shoulder joint and muscles.

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