

Acute Effects of Breast Cancer Surgery on Shoulder Function, Quality of Life, Range of Motion and Strength

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Background: Breast cancer is the most common cancer in women in the United States. With the increasing incidence of this disease and improved treatment, it has become evident that greater efforts must be directed toward improving quality of life and function for survivors. Limited evidence is available detailing the acute effects of breast cancer surgery on shoulder impairments, function and quality of life.

Purpose: The purpose of this study was to examine the acute effects (4-6 weeks) of breast cancer surgery on shoulder function, quality of life (QOL), range of motion (ROM) and strength in breast cancer survivors (BCS).

Design and Setting: Pretest-posttest design in a breast clinic setting.

Patients: BCS (n = 11) who had lumpectomy (n = 8) or mastectomy (n = 3) for breast cancer (mean age 56.6 = ± 9, height= 166 ± 7 cm, mass = 84 ± 22 kg).

Methods: Data was collected at 2 time periods: pre-surgery and post-surgery (4-6 weeks). BCS completed the Disabilities of Arm, Shoulder and Hand (DASH), Pennsylvania Shoulder Score (PSS), and FACT-B. Two trials of shoulder active (AROM) and passive (PROM) were measured on the affected arm using a digital inclinometer for flexion (FLX), external rotation at 90° (ER), internal rotation at 90° (IR), and extension (EXT). Two trials of shoulder strength were measured using a hand held dynamometer (HHD) on the affected arm for the serratus anterior (SA-HHD), lower trapezius (LT-HHD), flexion (FLX-HHD), scaption (SCAP-HHD), external rotation (ER-HHD), internal rotation (IR-HHD), and horizontal adduction (ADD-HHD). A repeated measures ANOVA was used to examine changes from pre-surgery to post-surgery.

Results: Significant differences were found for the DASH (p=0.05, effect size (ES)=0.93), PSS (p<0.001, ES=3.12), FACT-B social (p=0.37, ES=0.80), AROM EXT (p=0.01, ES=0.66) and IR (p=0.05, ES=0.59), PROM EXT (p=0.001, ES=1.02), SA-HHD (p=0.05, ES=0.71), FLX-HHD (p=0.05, ES=0.84), IR-HHD (p=0.05, ES=0.79), ER-HHD (p=0.03, ES=0.86), SCAP-HHD (p=0.05, ES=0.81), and ADD-HHD (p=0.30, ES=0.91). No significant differences were found on the total FACT-B or physical, emotional, functional, additional concern subscales, AROM FLX and ER, PROM FLX, ER, and IR, and LT-HHD.

Conclusions: Breast cancer surgery resulted in decreased function on the DASH and PSS, decreased social QOL (FACT-B), decreased EXT AROM and PROM, and a decrease in 6 of the 7 strength measures. Interestingly, AROM IR improved (4.3°) from pre-surgery to post surgery.

Clinical Relevance: Research has primarily focused on late effects (>6 months) of breast cancer treatment. Our results show strength appears to be affected more so than ROM from breast cancer surgery. It is recommended that shoulder strength and function be targets of future early intervention programs for BCS. Future studies should utilize a larger sample size and analyze whether the type of breast surgery plays a factor in acute effects.