

## **Upper Extremity Cording Following Treatment for Breast Cancer**

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**Background:** Cords are bands of tissue that can form following surgery for breast cancer. They extend through the axilla and often continue across the antecubital fossa into the forearm. This condition is painful and restricts shoulder and elbow range of motion. To date, the literature regarding incidence is not robust. The few authors who have published series of patients report that cording is self limiting and resolves within three months following surgery.

**Purpose:** The aim of this study was to determine the natural history and incidence of cording following treatment for breast cancer.

**Design/Setting:** This was a prospective study carried out in a multidisciplinary breast center at a large urban tertiary care hospital. Patients: 158 women with breast cancer.

**Methods:** From August 2009 to May 2011, 158 patients were assessed with volumetric arm measurements using the perometer and by completing an electronic survey, the Lymphedema Evaluation Following Treatment for Breast Cancer (LEFT-BC). The LEFT-BC addresses upper quarter symptoms, cording, physical function, and quality of life. This cohort was assessed preoperatively, at the first post surgical visit, following chemotherapy/radiation and then at 4-7 month intervals thereafter. Edema was quantified mathematically as the relative volume change (RVC) in arm volume compared to the baseline measurement. Lymphedema was defined as an  $RVC \geq 5\%$  above baseline. Groups were compared utilizing the Fisher exact test.

**Results:** 56 patients (56/158, 35.44%) reported cording at the first post operative measurement, with a mean time to follow up of .770 months. 110 patients had a second post operative measurement with a mean time to follow up of 3.84 months. 35 women (35/110, 31.82%) reported cording at this data point, with 11 of the 35 (11/110, 10%) were reporting cording for the first time. 59 women had a third post operative reading with a mean time to follow up of 7.97 months. 18 of this group (18/59, 30.51%) reported cording at this data point, with 4 of the 59 (6.80%) reporting cording for the first time.

**Conclusions:** Cording following breast cancer surgery is not an infrequent event and does occur beyond the initial post operative period. Continued study of cording, specifically etiology, time to resolution, and investigating possible intervention strategies is necessary if providers of care are to address this condition with evidence based decisions.

**Clinical relevance:** With survival of breast cancer steadily increasing, the quality of life challenges that patients need to cope with are receiving more attention. Orthopedic shoulder and elbow therapists should be knowledgeable about cording following treatment for breast cancer as patients are often referred to physical or occupational therapy for assistance in restoring upper extremity function following treatment for their disease.