

Hand Related Disorders Following Axillary Dissection for Breast Cancer

DAVID J. BOZENTKA, M.D.,¹ PEDRO K. BEREDJIKIAN, M.D.,¹ PETER S. H. CHAN, M.D.,² STEVEN SCHMIDT, M.D.,³
GORDON P. BUZBY, M.D.,⁴ AND FIONA BORA⁵

Abstract: Lymphedema is the most common complication of an axillary dissection with lymph node examination. A retrospective chart review and a detailed questionnaire were used to evaluate the prevalence of hand disorders in patients following breast surgery with an axillary dissection. The questionnaire was sent to 250 patients who had undergone an axillary dissection for breast cancer. 143 patients returned the questionnaire and based upon the presence of hand numbness and tendinitis type pain patients were categorized as either symptomatic or asymptomatic. Forty-seven patients (33%) reported significant post-operative edema. Forty-five (31%) patients noted hand numbness or tingling, with difficulty in grasping objects, or weakness of the operated side. Fifteen (10%) of the patients had been given the diagnosis of carpal tunnel syndrome since surgery. Seventeen (12%) of patients noted clicking, or sticking of their fingers or thumb and five (3%) had been given the diagnosis of a trigger digit. There was a significant difference between symptomatic and asymptomatic patients with regards to presence of lymphedema ($p = 0.001$) and the amount of edema ($p = 0.03$).

Introduction

Breast cancer is the most common malignancy in women with over 185,000 women diagnosed with breast cancer in the United States each year [1,16,18]. The majority of breast cancer patients undergo some form of surgery in the treatment of the early stages of the disease. Axillary dissection, with removal of lymph nodes, is often performed as a staging procedure and guide for adjuvant therapy. Lymph node staging is considered the most important factor in determining risk of recurrence of disease [7,15,17,24,31,32]. Post-operative arm symptoms after breast surgery with axillary dissection have been reported to be as high as 82% [8,9,14]. Some of the arm symptoms reported after axillary dissection include limited shoulder range of motion, upper arm numbness, and weakness [8,19,22,32].

Lymphedema is considered the most common complication occurring in 3 to 50 percent of patients after axillary dissection [3,4,6,9,10,13,24,25,27]. Edema of the upper ex-

tremity from other problems, such as pregnancy related fluid retention, trauma-induced edema, or infection are associated with several hand disorders. Some of these disorders include stenosing flexor tenosynovitis (trigger finger), De Quervain's tenosynovitis, and carpal tunnel syndrome [5,6,11,20,21,28]. Despite the large number of surgical procedures performed each year for breast cancer, there are very few articles studying the relationship of lymphedema to hand disorders. Our goal in this study was to evaluate the prevalence of hand disorders in patients following breast surgery with an axillary dissection.

Materials and Methods

250 patients who underwent modified radical mastectomy (MRM), lumpectomy with axillary dissection (LAD), or axillary dissection (AD) from 2/1/93 to 2/19/96 at the Hospital of the University of Pennsylvania were identified. The study protocol was approved by the Committee on Studies Involving Human Beings at the University of Pennsylvania (Protocol #873-0). The medical records were reviewed to obtain general demographics as well as information regarding the level of axillary dissection, number of nodes taken, and adjuvant radiation, or chemotherapy received. A questionnaire was sent to each of the patients. The questionnaire addressed the presence or absence of edema and, if present, the amount as measured by difference in arm circumference. The questionnaire also posed questions regarding symptoms often present in common hand afflictions. In particular, complaints of hand paresthesias, triggering or tendinitis type pain were elicited. Based upon their responses for hand numbness and tendonitis type pain, patients were categorized as either symptomatic or asymptomatic. Statistical analysis was performed to determine if symptoms correlated with any specific surgical aspect or the presence of edema. The data was analyzed using unpaired *t* tests and the non-parametric data was evaluated using chi-square.

Results

143 patients responded to the questionnaire for a response rate of 57%. The average age of responders was 56 years old (range 33 to 90 years). Seventy-nine patients (55%) had

From the ¹Department of Orthopedic Surgery, Hand Surgery Section, Hospital of the University of Pennsylvania, ²Tuckahoe Orthopedic Associates, ³Plastic Surgery Associates of Lancaster, LLC, Lancaster, Pennsylvania, and ⁴Department of Surgery, Hospital of the University of Pennsylvania. Address correspondence to: David J. Bozentka, M.D., Department of Orthopedic Surgery, Hand Surgery Section, Hospital of the University of Pennsylvania. ⁵Wharton School of Business, University of Pennsylvania.

undergone (MRM), 55 patients (38%) underwent lumpectomy and axillary dissection (LAD), and 9 patients (6%) underwent axillary dissection (AD), all for breast cancer. The average number of nodes taken was 14 (range 1 to 29). The average level of dissection was II. Reported comorbidities included 19 patients with hypertension, 11 with osteoarthritis, 7 with hypothyroidism, 4 with diabetes mellitus, and 4 with an inflammatory arthritis.

Forty-seven patients (33%) reported significant post-operative edema. These patients subjectively noted their arm was on average one inch larger (range 0.25 to 3 inches) compared to the contralateral arm. Eighteen of the patients (13%) had sought medical attention for problems with their hand since surgery. Forty-five patients (31%) noted hand numbness or tingling, with difficulty in grasping objects, or weakness of the operated side. Fifteen of the patients (10%) had been given the diagnosis of carpal tunnel syndrome since surgery. Seventeen patients (12%) noted clicking, or sticking of their fingers or thumb when attempting to move them, and 5 (3%) had been given the diagnosis of a trigger digit. There was no significant difference between patients who reported symptoms and those who were asymptomatic with respect to the following parameters: age, number or level of nodes taken, type of procedure, and adjuvant radiation or chemotherapy. There was a significant difference between symptomatic and asymptomatic patients with regards to presence of lymphedema ($p = 0.001$) and the amount of edema ($p = 0.03$).

Conclusion

The incidence of arm related symptoms after axillary dissection is high [8,9,14]. Wound related disorders including seroma, infection, and skin necrosis may occur in the early postoperative period [2,9]. Other complications reported include shoulder stiffness, grip strength weakness, pain, and psychosocial distress [3,8,14,19,22,29,32]. Intercostal brachial nerve syndrome can cause paresthesias and pain of the upper arm. These symptoms are related to an injury to the intercostal brachial nerve that innervates the proximal ulnar aspect of the arm [30].

Lymphedema is the most common complication following axillary dissection. In our group of patients, 33% reported symptoms consistent with lymphedema. This proportion of patients with lymphedema following axillary dissection is within the 3 to 50% range reported in other series [4,6,9,10,13,24,25,27]. Lymphedema tends to increase with greater extent of axillary dissection and with adjuvant radiation therapy [17,22,24,29,32]. Rytov et al. [22] reported late arm lymphedema in 11% of patients who underwent mastectomy and partial axillary dissection alone, compared to 46% in the group of patients receiving adjuvant irradiation in addition to surgery. Larson et al. [12] reported lymphedema in 37% of patients undergoing full axillary dissection versus 8% of patients with a level I-II dissection. They also noted an increased incidence of edema when a greater number of nodes were taken. In their series edema occurred in 28% of patients when more than 10 lymph

nodes examined compared to 9% when 1 to 10 lymph nodes were taken [12].

Thirty-one percent of the patients in our series reported numbness and tingling of the hand and 10% had been given the diagnosis or carpal tunnel syndrome. This is consistent with the findings of Ganel et al. [6] who reported an increased incidence of carpal tunnel syndrome following mastectomy. In their series, CTS was noted on the ipsilateral side following mastectomy in 28% of the patients compared to CTS occurring on the nonoperated side in 8% [6]. In our series 12% of patients reported symptoms consistent with stenosing flexor tenosynovitis with 3% of patients diagnosed as having a trigger finger. Patients tended to be symptomatic relative to the hand numbness and tendinitis problems if lymphedema was present ($p < 0.05$) as well as when considering the amount of edema ($p = 0.03$).

Wound infection and the progression of lymphedema has been reported following upper extremity surgery in patients that have had prior breast surgery [3,26]. Dawson et al. [3], however, noted no complications after performing carpal tunnel release under intravenous regional anesthesia. In their series 15 women had previous mastectomy and axillary dissection with 7 having post axillary dissection edema. If elective upper extremity surgery is required it can be performed safely, provided strict sterile technique and appropriate anesthetic and surgical precautions are observed [3].

Less invasive alternatives to axillary dissection such as sentinel node biopsy will hopefully limit these complications [4,23]. Sentinel lymph node biopsy selectively samples only the lowest axillary nodes draining the breast and should therefore be associated with less morbidity. Schrenk et al. [23] prospectively compared arm symptoms in 35 breast carcinoma patients after axillary lymph node dissection of Level I and II and 35 patients following sentinel lymph node biopsy. They showed a significantly higher rate of subjective lymphedema, pain, numbness, and motion restriction of the axillary dissection patients compared with the sentinel node biopsy patients [23].

The main limitations of our study relate to the method of data collection in using a questionnaire. Just over half of the patients answered the questionnaire, which may be a source of bias. Those patients that were symptomatic may have been more likely to return the questionnaire. A complete history and physical exam of each patient would likely provide more accurate information. The symptoms described by the patients may have been related to arthritic rather than tendinitic problems. Numbness and tingling in the extremity may have been related to factors unrelated to the lymphedema, such as cervical radiculopathy or intercostal brachial syndrome rather than a peripheral compression neuropathy.

Despite these limitations, our results demonstrate that patients report symptoms of potential nerve entrapment, triggering, or tendonitis with surprising frequency after major breast surgery. Patients are more likely to report these symptoms depending on the presence and amount of measurable edema. We believe that further investigation of this association is warranted.

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