

# Malpractice Leading to Secondary Lymphedema after Radical Mastectomy: Case Report

Ilke Keser Selda Basar Irem Duzgun Nevin A. Guzel

Gazi University Department of Physiotherapy and Rehabilitation Faculty of Health Sciences, Ankara, Turkey

## Keywords

Breast cancer · Chemotherapy · Pain · Edema

## Summary

**Background:** With this case report we want to demonstrate the results of chemotherapy application to the mastectomized side in a patient who had undergone radical mastectomy. **Case Report:** A patient who was accidentally given chemotherapy on the mastectomized side (PCMS) and a control patient who received chemotherapy on the non-affected side (PCNS) were included in this study. Edema, pain, muscle strength, and shoulder mobility were evaluated. The results of the 2 patients were compared. After chemotherapy, PCMS experienced edema and pain in the affected arm compared to PCNS. Increased circumference measurement, and decreased shoulder mobility and muscle strength were observed in PCMS. **Conclusion:** It was suggested that chemotherapy application on the mastectomized side triggered lymphedema. Our findings on the subject revealed that education of health care professionals and patients alike is very important.

## Introduction

Lymphedema is a pathological situation that is characterized by protein-rich lymph fluid accumulating in the interstitial tissue [1], and may be primary or secondary. Secondary

This case report was also presented at '3. Ulusal Fizyoterapi Rehabilitasyon Kongresi', 14/05–16/05/2011. The title of the poster was 'Radikal mastektomi sonrası kemoterapi uygulamasında malpraktis: vaka raporu', and it was presented by Ilke Keser, Irem Duzgun, Selda Basar, and Nevin Atalay Guzel.

## Schlüsselwörter

Mammakarzinom · Chemotherapie · Schmerz · Ödem

## Zusammenfassung

**Hintergrund:** Unser Ziel ist es, die Auswirkungen der Chemotherapie-Verabreichung über die mastektomierte Seite bei einer Patientin nach radikaler Mastektomie zu demonstrieren. **Fallbericht:** Die Studie umfasste eine Patientin, welcher eine Dosis Chemotherapie versehentlich über die mastektomierte Seite verabreicht wurde (PCMS) sowie eine Kontrollpatientin, bei welcher die Verabreichung des chemotherapeutischen Wirkstoffs auf der unbehandelten Seite erfolgte (PCNS). Ödem, Schmerz, Muskelstärke und Schulterbeweglichkeit wurden evaluiert. Die Ergebnisse beider Patientinnen wurden verglichen. Im Vergleich zu PCNS kam es bei PCMS im Anschluss an die Chemotherapie zu Ödembildung und Schmerzen im betroffenen Arm. Bei PCMS wurden eine Umfangsvermehrung des Arms sowie verminderte Schulterbeweglichkeit und Muskelstärke beobachtet. **Schlussfolgerung:** Wir glauben, dass die Verabreichung der Chemotherapie über die mastektomierte Seite die Lymphödementstehung bewirkt hat. Des Weiteren hat sich erwiesen, dass die Weiterbildung und Information von sowohl Gesundheitspersonal als auch Patienten von großer Wichtigkeit ist.

lymphedema is the most common form of lymphedema in conjunction with oncologic surgery involving lymph node dissection. Other causes are infection, neoplasia, radiation, insect bites, surgical excision, and paralysis, which can lead to lymphatic obstruction or injury. Lymphedema of the arm following axillary lymph node dissection is the most frequent reason of secondary lymphedema [2–4]. A review on secondary lymphedema suggests that from 6 months after surgery, 1 in 5 patients treated for breast cancer will experience secondary lymphedema. The fact that the number of patients with lymphedema increases with time from surgery suggest that the true prevalence of this condition may be underestimated

as many women may not be receiving appropriate care for their condition [5, 6]. Patients with axillary lymph node dissection can prevent or reduce the risk of developing lymphedema by changing their behavior and making adjustments to daily living [7]. However, it was shown that many patients did not receive information about lymphedema or preventative measures [8]. Without treatment, lymphangiectasia and predisposition to acute inflammatory episodes such as cellulitis are possible skin-focused side effects of lymphedema [9, 10]. Acute lymph stasis-related inflammation (cellulitis/lymphangitis or erysipelas) are characterized by erythema [2, 4], pain, high fever, and, less commonly, septic shock. Mild skin erythema without systemic signs and symptoms does not necessarily signify bacterial infection [11]. Lymphedema can be prevented or limited by suitable measures following mastectomy [12–14]. The occurrence risk of lymphedema can be decreased by patient education provided by health professionals [13, 15, 16]. Therefore, training of health professionals about the possible consequences of incorrect practices is extremely important. The aim of this study was to demonstrate the results of accidental chemotherapy application from the mastectomized side in a patient who had undergone radical mastectomy.

### Case Reports

This study included 2 patients who had undergone radical mastectomy due to breast cancer. A patient who was given chemotherapy from the mastectomized side (PCMS) was compared with a control patient who received chemotherapy via the non-affected side (PCNS). Both patients were similar in terms of age, sex, and number of received chemotherapy session. 6 chemotherapy sessions were applied to each patient. In the case of PCMS, the 5th application was accidentally given intravenously into the arm on the mastectomized side. Physiotherapy assessment was performed 5 weeks after this application. The visual analogue scale (VAS) was used to evaluate the level of pain in the affected arm; range of motion was measured with a universal goniometer (Baseline®, FEI, White Plains, NY, USA). Circumference measurements were performed at 4 cm distance from the styloid process of the ulna. The total score of circumference measurements was divided by the number of measurements to determine the amount of edema. Muscle strength was evaluated by holding 1 kg weight in 90-degree flexion or abduction position for 10 s. Data comparing the 2 cases are presented in table 1.

#### PCMS

This 75-year-old patient with a body mass index (BMI) score of 25 kg/m<sup>2</sup> was also diagnosed with diabetes mellitus and hyperthyroidism. During

chemotherapy application, extravasation occurred in the arm on the mastectomized side. Subsequently, progressive edema developed together with pain and sensitivity. The patient reported that the edema had started proximally and quickly spread to the entire arm. The severity of pain was scored 6.1 cm (VAS). Pain was represented as continuous and spread to the whole arm. Increased skin temperature and paresthesia in the hand were observed. The difference in circumference between the affected and the non-affected arm was 3.7 cm on average. Shoulder mobility was below 90 degrees in both flexion and abduction. Muscle strength was rated as decreased because the patient could not hold 1 kg of weight for 10 s in flexion or abduction.

#### PCNS

This 76-year-old patient had a BMI score of 31 kg/m<sup>2</sup>. The severity of pain was scored as 4.2 cm (VAS). The patient had pain spreading to the back and neck, which increased with movement. There was no change in skin temperature and no edema. Shoulder mobility was moderately limited (160 degrees). Muscle strength was normal.

### Conclusion

This case report highlights that chemotherapy application from the mastectomized side leads to an increased risk of lymphedema. Other risk factors such as diabetes mellitus and hyperthyroidism could also have precipitated lymphedema in PCMS; however, because of the sudden onset of lymphedema immediately after injection we considered that an acute inflammatory reaction may have induced the development of secondary lymphedema. PCMS experienced more pain and edema and less shoulder mobility in comparison to the control patient of similar age and chemotherapy history. Under normal circumstances, 1 in 5 patients treated for breast cancer will experience secondary lymphedema [5, 6]. However, it was thought that wrongful chemotherapy application accelerated the development of lymphedema in this patient.

The literature shows that teaching programs for surgical breast cancer patients on ways to prevent and limit lymphedema can decrease the incidence of lymphedema and increase patients' quality of life [15]. It is the responsibility of health care professionals to not only care and treat but also teach and support the patient, as they have the opportunity to communicate with the patient on an individual basis. Both health care professionals and patients should be aware of risk factors, signs, prevention, and management of lymphedema. It was found that lymphedema development due to insufficient knowledge and protective behavior arose from a lack of support from health care professionals [17, 18]. Hence, training of both health care professionals and patients is very important for preventing lymphedema.

### Disclosure Statement

The authors declare that they have no competing interests.

**Table 1.** Comparison between patient 1 (PCMS) and patient 2 (PCNS)

	Case	Control
Age, years	75	76
Body mass index, kg/m <sup>2</sup>	25	31
Visual analogue scale, cm	6.1	4.2
Difference in circumference measurement, cm	3.7	0.07
Shoulder flexion and abduction, degree	< 90	160
Received sessions of chemotherapy, n	6	6

- 1 Meneses KD, McNeese MP: Upper extremity lymphedema after treatment for breast cancer: a review of the literature. *Ostomy Wound Manage* 2007;53:16–29.
- 2 Witte CL, Witte MH: Disorders of lymph flow. *Acad Radiol* 1995;2:324–334.
- 3 Van O, Muizebelt G: Lymphedema. *Oncologica* 1997;14:31–34.
- 4 Casley-Smith JR, Morgan RG, Piller NB: Treatment of lymphedema of the arms and legs with 5,6-benzo-(a)-pyrene. *N Engl J Med* 1993;329:1158–1163.
- 5 National Breast and Ovarian Cancer Centre: Review of Research Evidence on Secondary Lymphedema: Incidence, Prevention, Risk Factors and Treatment. NBOCC, New South Wales, Australia, 2008, pp. 1–83.
- 6 Moffatt CJ, Franks PJ, Doherty DC, Williams AF, Badger C, Jeffs E, Bosanquet N, Mortimer PS: Lymphedema: an underestimated health problem. *QJM* 2003;96:731–738.
- 7 Harmer V: Breast cancer-related lymphoedema: risk factors and treatment. *Br J Nurs* 2009;18:166–172.
- 8 Ok M: Health care seeking behavior of Korean women with lymphedema. *Nurs Health Sci* 2003;6:149–159.
- 9 Linnitt N: Skin management in lymphoedema; in Twycross R, Jenns K, Todd J (eds): *Lymphoedema*. Oxford, Radcliffe Medical Press, 2000, pp. 118–129.
- 10 MacLaren J: Skin changes in lymphoedema: pathophysiology and management options. *Int J Palliat Nurs* 2001;7:381–388.
- 11 2009 Consensus Document of the International Society of Lymphology: The Diagnosis and Treatment of Peripheral Lymphedema. *Lymphology* 2009;42:51–60.
- 12 Bosompra K, Ashikaga T, O'Brien PJ, Nelson L, Skelly J: Swelling, numbness, pain and their relationship to arm function among breast cancer survivors: a disablement process model perspective. *Breast J* 2002;8:338–348.
- 13 Paskett E, Stark N: Lymphedema: knowledge, treatment and impact among breast cancer survivors. *Breast J* 2000;6:373–378.
- 14 MacLean R, Miedema B, Tatemichi S: Women's experiences with breast cancer related lymphedema: an underestimated condition. *Can Fam Physician* 2005; 51:246–247.
- 15 Bosompra K, Ashikaga T, O'Brien PJ, Nelson L, Skelly J, Beatty DJ: Knowledge and managing lymphedema: a survey of recently diagnosed and treated breast cancer patients. *Patient Educ Couns* 2002;47:155–163.
- 16 Gary DE: Lymphedema diagnosis and management. *J Am Assoc Nurse Pract* 2007;19:72–78.
- 17 McWayne J, Heiney SP: Psychologic and social sequelae of secondary lymphedema. *Patient Educ Couns* 2007;66:311–318.
- 18 Lee Y, Mak S, Tse S, Chan S: Lymphedema care of breast cancer patients in a breast care clinic: a survey of knowledge and health practice. *Support Care Cancer* 2001;9:634–641.