CASE STUDY:

Low-Level Laser Therapy In Complicated Post-Breast Cancer Lymphedema

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I. REASON FOR PRESENTING CASE

Although there is research that investigates the use of low-level laser therapy (LLLT) for the treatment of lymphedema, research sample sizes are small. The Oncology Nursing Society’s Lymphedema Management “Putting Evidence into Practice” team ranked LLLT as “evidence not established.” Nevertheless, our clinic felt confident enough with the research to try LLLT to see if it offered added benefits for patients with lymphedema. The first patient we chose was not new to us, and her lymphedema is chronic and complicated by a very disfiguring mastectomy and old clavicle fracture. Since she had been treated with standard therapy in the past with moderate results, we determined her to be an ideal candidate for LLLT.

II. CASE HISTORY

KL is an 85-year-old female breast cancer survivor. Her primary care doctor referred her in March 2008 for LE therapy. She has chronic lymphedema in the left upper extremity and has had lymphedema therapy, most recently in 2006. She underwent a left radical mastectomy with full lymph node dissection, radiation therapy and chemotherapy in 1974. In 1996, she had a spontaneous left clavicle fracture which triggered the left upper extremity lymphedema. She has left chest adhesions. She denies episodes of cellulitis or cancer recurrence. She has a pacemaker on the right side of her chest wall. Her medications include K-dur, 10 mg daily, Zocor 20 mg daily; Zoloft 50 mg daily; Caltrate 600 mg daily; Levoxyl 75 mg daily; ASA 81 mg daily; Actonel 35 mg weekly and Vitamin E 400 mg daily. Her Blood Pressure was 110/60, pulse 80, weight 147 lbs.

III. FIRST ROUND OF THERAPY

When KL was first seen in March 2008 she had some hand swelling and considerable arm swelling that was no longer manageable. Between March 27, 2008, and June 4, 2008, KL received 12 sessions of MLD and some light compression. Using a measuring tape noting every 4 cm and the standard cone calculations, the volume difference from start of treatment was 1192.78 ml and at the end of treatment 553.35 ml, or a total percentage difference of 53.61% from treatment 1. She was fitted for a new custom compression sleeve. KL’s lymphedema improved and thereafter she came in monthly for a recheck and therapy.

IV. SECOND ROUND OF THERAPY

In November 2008, KL moved into an assisted living facility. Because of packing and unpacking her belongings, her arm usage increased and she would often go without wearing her prescribed sleeve. Her lymphedema worsened again, so she returned to intensive therapy and had six treatments of manual lymph drainage, MLD, and light compression bandaging. While in therapy the second time, her volumes increased: the starting volumetric measurement was 2648.92 ml, ending 3482.22 ml in the left upper extremity. This increase of 846.40 ml was distressing, particularly to KL.
Several factors could account for this. First, she resisted compression bandaging and complained it was difficult to apply and maintain. In addition, she had been instructed to wear a sleeve while not in compression bandages. She frequently would “forget to wear” her sleeve, which had stretched out of shape due to increased swelling and the ageing of the garment (7 mo. old).

Given these circumstances and KL’s age, a trial of LLLT seemed like a modality that would have a reasonable chance of success.

V. THIRD ROUND OF THERAPY

On December 29, 2008, we revised KL’s plan of care and initiated CDT with LLLT. We used a hand held low level laser model, which we had purchased in November 2008. Following the instructions we received from the manufacturer, we designed a plan of care (see below). KL has always resisted wrapping and her former therapist never used compression bandaging. Keeping her wrapped would be our greatest challenge. Her goal was to wear her clothes and jewelry as before. KL had dramatic fibrosis (both radiogenic and secondary to the mastectomy) on her chest and her shoulder. Past therapy never satisfactorily softened the fibrosis. Both the old clavicle fracture and fibrosis impeded her arm function, particularly external and internal rotation (external rotation, 50 degrees; internal rotation, 50 degrees; abduction, 110 degrees; and flexion, 110 degrees). She experienced tenderness with deep palpation of the shoulder and clavicle. She frequently complained of dull pain, numbness and tingling in the fingers of the left hand. There were days that the shoulder pain would increase to a level 6 on a 1-10 pain scale. Often her pain, numbness and tingling were contingent upon arm position and would be triggered during therapy.

VI. PROTOCOL AND PROCEDURE FROM 12/29/08 TO 1/29/09

KL was treated with LLLT followed by MLD and mild compression wrapping. Based on the study by Carati, we initially focused on the medial aspect of the upper arm and applied 17 points, a minute each, 2 cm apart. Using a washable marker, we drew a grid and applied laser to this same area on numerous visits.

Later, because we wanted to treat more than one area and to keep to 17 minutes of laser therapy, we changed from a minute to a half-minute (based on information on the Riancorp website). This allowed us to cover additional areas, such as her shoulder, within the allotted 17 minutes. A typical session included 17 points (30 seconds each) in a grid pattern on the medial upper arm, and 17 points (30 seconds each) along the clavicle, shoulder, anterior and posterior. On a different day, we would treat the anterior chest and the flank with the laser, using 17-30 second points. The laser has a timer so keeping accurate time is effortless.

After 17 minutes of LLLT, KL was treated with MLD following standard guidelines with the intent to stimulate healthy tissue drainage creating a negative pressure to drain lymphedematous tissues. Next, a hypoallergenic lotion was applied to the arm followed by finger bandaging, and arm bandaging using stockinette, cotton type padding, and three short stretch bandages. She could remove the wraps the following day, or that same evening, but replace the wraps with the stretched out Class II compression garment (without finger or hand compression). KL wore some form of compression most of the time. Her adherence improved over the course of the month. Finger wraps were discontinued when the hand swelling reduced.

VII. RESULTS

By January 29, 2009, KL had received 12 sessions of CDT and LLLT. The original plan was to treat her three times a week for three weeks, as had been done in the research. (Carati,
From week 1 to week 3, arm volume decreased by 496 ml or 58.57%. We decided to continue treatment for an additional week. With this extra week, the total volume decreased by 658.54 ml or 77.80%. In addition, the fibrosis softened; there was more flexibility in the shoulder joint with some improvement in ROM. Although some finger numbness continued KL no longer complained of pain and tingling.

VIII. CONCLUSION

KL was fitted for a Class II custom sleeve without a hand piece and received it in February. She has returned monthly for rechecks and another new sleeve was ordered in May. She continues to improve and maintenance is relatively easy, consisting of wearing the sleeve daily and monthly rechecks. At each recheck, we treat her with CDT and LLLT. Her most recent photos, 6/10/09, show the continued improvement in the hand, arm and the chest fibrosis. These photos were taken a week after having received the new compression garment. This patient received both standard care and LLLT to treat her breast cancer care related LE and fibrosis. Based on the positive outcomes of this case study, we have grown confident in the use of LLLT for all of our patients. It is regrettable that we still are unable to bill for laser therapy, but we are grateful to Dr. Colin Kanar for purchasing the laser which continues to improve LE therapy outcomes—most notably with its profound, immediate effect on fibrotic tissue and pain.

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