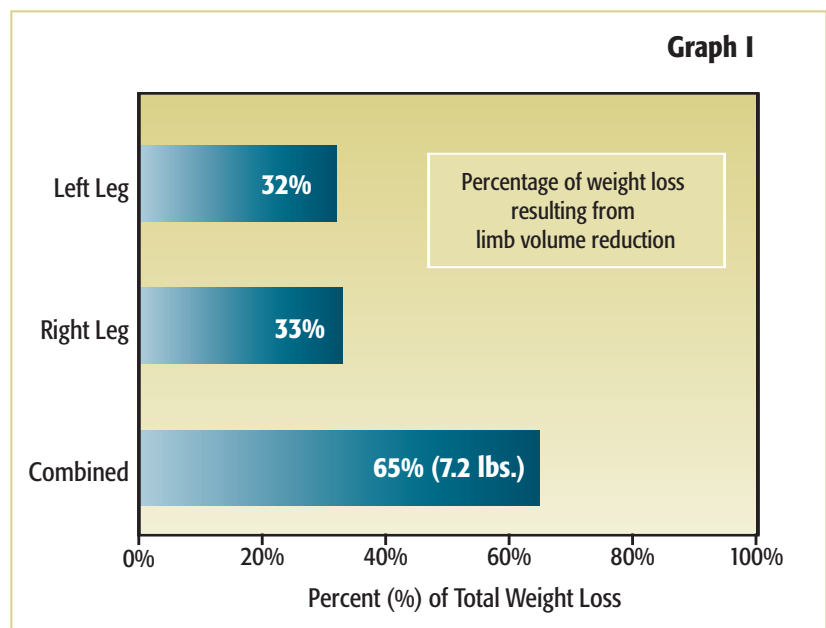


CASE STUDY

GR – Severe Post-Trauma Bilateral Lower Extremity Lymphedema



ABSTRACT

A 52-year-old woman, experienced progressively severe bilateral lower extremity lymphedema following a traumatic injury sustained in 1989. Despite conscientious application of a variety of home therapy techniques, GR was unable to stabilize her lymphedema. Although professionally administered in-home manual lymph drainage (MLD) therapy sessions did provide short-term relief, fluid accumulation quickly returned when professional support ceased. GR's condition progressed until she participated in a 30-day trial therapy with the Flexitouch® Lymphedema System in 2005. After 30 days of treatment, GR experienced significant clinical improvements in her condition; fluid volume measurements showed a reduction of 1,574 ml in her lower right limb and 1,696 ml in her lower left limb. This significant fluid loss, with concomitant physiological effects, translated into an 11 pound reduction in total body weight. Fluid loss in her limbs alone accounted for sixty-five per cent of the weight loss. (Graph I) GR also experienced increased mobility, increased functional status, decreased infections, and reduced reliance upon prophylactic antibiotic therapy.

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In April of 1989, while working as a corrections officer, GR was attacked with a knife-like weapon. As a result of this injury, the lymph nodes at the top of her right leg were damaged severely. Within weeks, her right leg began to swell and she was diagnosed with secondary lymphedema.

GR underwent numerous failed surgical attempts to improve local lymph system function. Most aggressively, in 1990 she underwent a procedure to transpose a suprapubic lymph vessel from the left thigh to the right groin. The surgery was unsuccessful and her condition progressed. She continued to suffer with chronic lymphedema of the lower right extremity.

In 2000, GR experienced an episode of deep vein thrombosis (DVT) in her lower left leg and was placed on a regimen of Coumadin therapy. Effects of the DVT episode aggravated her condition; chronic edema now affected both lower extremities.

GR's mobility and independence were limited severely by her condition. She had to rely on either a cane or wheelchair to get around and was unable to lift her right leg without assistance. Her condition was further complicated by severe arthritis in both hands, a condition exacerbated by the repetitive motions required to use her wheelchair and apply compression garments on a daily basis. She suffered chronic pain related to her lymphedema. To control pain, her physician prescribed methadone.

GR also experienced recurring cellulitis in the lower right extremity requiring several hospitalizations, up to three weeks in duration, with intravenous antibiotic therapy. Prophylactic efforts with antibiotics failed. The skin on GR's legs would frequently crack, rupture and develop interstitial fluid leaks. GR also developed progressive fibrosis.

She diligently tried a variety of home maintenance techniques to control her lymphedema. In addition to her routine use of compression garments, she utilized low-stretch compression bandaging, Reid compression sleeves, and self manual lymphatic drainage (MLD).^{1,2} The effectiveness of self-MLD was limited by her severe arthritis.

Traditional pneumatic compression pumps offered no relief. Traditional compression pumps apply sequential pressure to forcibly displace and move fluid.^{3,4} Although a reduction in limb volume may result, compression pumps are associated with significant adverse events and their use now discouraged.^{3,4} GR used her compression pump between one and three hours daily. However, her condition further deteriorated. GR experienced severe adverse effects that have been associated with compression pump use in lower extremity patients including swelling in the genital area accompanied by increased discomfort and difficulty urinating.

Ongoing professional MLD therapy proved to be an effective but unsustainable intervention. MLD is a complex, two-step form of massage therapy designed to 1) remove lymph fluid from congested areas, particularly the trunk, by stimulating lymph flow in more proximal, functioning lymphatics and 2) re-direct "collected" fluid to functioning lymph nodes for return to the circulation by normal physiological processes.⁵ Although MLD may be effective,⁶ the nature of the therapy and the need for life-long treatment limit the patient's ability to effectively comply with the rigorous and specific techniques.⁵

While receiving costly twice-weekly professional MLD therapy in her home, GR experienced short-term relief of pain and pressure but only minimal reduction of excess fluid. The edema generally returned the day following therapy and she was unable to maintain any progress.

In 2005, after suffering from lymphedema for nearly 17 years, on the recommendation of her physician and physical therapist, GR agreed to participate in a 30-day trial of the Flexitouch® system. Therapeutic goals of the trial included achievement of clinically significant reductions in edema, incidents and severity of infection and improvements in functional status.

The Flexitouch Lymphedema System is designed for use in the home as part of continued lymphedema therapy maintenance. Equipment consists of an electronic controller unit and garments designed to accommodate the affected areas. The Flexitouch system uses a two phase preparation and drainage sequence that follows the physiology of the lymphatic system and is designed to simulate MLD therapy. First a slight gradient of pressure is applied to the trunk to prepare for and direct an augmented flow of lymphatic fluid. Then, drainage of the affected limb is accomplished by gentle pressure cycles that advance and direct lymphatic flow along anatomical pathways for return to the central circulation.⁷

In November of 2005, after 30 days of therapy with the Flexitouch system, GR's right and left legs showed volume reductions of 1,574 ml and 1,696 ml respectively. The total volume of fluid loss was 3.27 liters. Over the course of treatment with the Flexitouch system, the patient lost eleven pounds; at least 65% of which was directly attributable to Flexitouch-related edema reduction and the balance to concomitant physiological effects.⁸ The patient made no changes in diet or exercise during this period. Genital swelling showed no increase during therapy with the Flexitouch system.

Results for GR were significant following 30 days of therapy with the Flexitouch system. Consistent with her physician's therapeutic goals, GR experienced progressive reductions in limb fluid volumes as well as increased mobility and

GR initiated use of the Flexitouch system in October, 2005. Her progress was tracked weekly by a physical therapist throughout the trial.

Her treatment protocol for home therapy with the Flexitouch system specified a two-hour session on the right leg once daily, and a one-hour therapy session on the left, less affected leg once daily. Both lower extremity and trunk garments were applied using a standard pressure setting for each leg. Therapy sessions were spaced at least six hours apart for right and left legs.

diminished pain and discomfort. Among important quality-of-life benefits, GR felt the effects of weight reduction in her legs and regained ability to walk unassisted without falling down. She also experienced a reduction in groin pain and less difficulty urinating. For the first time in seventeen years, she was able to see her right kneecap. Her fibrosis was also improved.

The Flexitouch system provided GR a consistent and clinically effective means for significant edema reduction in the home. For GR, where other therapy methods had failed, the Flexitouch® system emerged as the only modality that has allowed her to achieve her physician's clinical goals of reduced edema, improved functional status, decreased infections and reduced reliance upon prophylactic antibiotic therapy.

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