

# Caring for the Bariatric Patient with Lymphedema and Obesity



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There are many health risks associated with obesity, including cardiovascular disease, diabetes mellitus, sleep apnea, hypertension, gallbladder disease, degenerative joint disease and depression. Another common but often overlooked health problem associated with obesity is lymphedema, the accumulation of protein-rich fluid in the body's tissues. Although lymphedema has many causes and can affect people who are not overweight or obese, obesity increases a person's risk for developing this serious disorder.

More than 3 million people in the United States are diagnosed with lymphedema each year.<sup>2</sup> One of the first symptoms of lymphedema is swelling; usually of an arm or a leg, but the trunk can be involved as well. Lymphedema sufferers report feelings of heaviness and tightness in the affected areas and often find that clothing that once fit is now too snug. When both legs or both arms are involved, the swelling is usually worse on one side. Once lymphedema symptoms begin, the disease gets progressively worse. Untreated lymphedema can lead to disfigurement, skin hardening, life-threatening infections, psychological distress and certain forms of cancer. The rate at which the disease progresses depends on many factors, including a person's medical history and how often the swollen part becomes infected.

## The Lymphatic System

The lymphatic system transports fluid from the tissues back to the circulatory system and also helps to fight infection. In normal circulation, blood leaves the heart through the arteries, passes through the capillaries, then returns to the heart through the veins. Oxygen, water, and proteins leave the arterial end of the capillary by ultrafiltration as blood passes through the capillaries. Ninety percent of this fluid is reabsorbed at the venous end of the capillary. The remaining ten percent is returned to circulation by the lymphatic system. If the lymphatic system fails, protein-rich fluid accumulates in the tissues, leading to swelling (lymphedema) in the affected areas.

The lymphatic system is composed of superficial (in the skin) and deep (below the skin) vessels and lymph nodes. Lymph is formed when interstitial fluid enters small, finger-like vessels called lymph capillaries. From the capillaries, lymph travels through a series of progressively larger lymphatic vessels and lymph nodes before finally re-joining the circulation at the junctions of the subclavian and internal jugular veins in the neck. The larger lymphatic vessels contain valves—like those found in veins—that prevent lymphatic back flow. Muscle, joint and tissue movement during normal, everyday activity are major forces that propel fluid into and through the lymphatic vessels. Rings of smooth muscle surround the larger lymph vessels, and their contractions (five to ten



per minute) also help move fluid through the system.

Lymph nodes are attached to the lymphatic vessels and function as filters. As lymph passes through the nodes, waste products and potentially harmful substances, such as bacteria, viruses and cancer cells, are removed. B cells, T cells and plasma cells that are present in the nodes then attack and attempt to neutralize the foreign substances.

## Lymphedema

For lymphedema to develop, there has to be both damage to the lymphatic system and a trigger that stresses the damaged system past its limited ability to carry fluid. There are two types of lymphedema; primary and secondary. Primary lymphedema is present from birth and is caused by impaired development of the lymph vessels and/or nodes. It affects women more than men. Although commonly seen in one or both legs, it can also involve the arms. Symptoms of primary lymphedema may be seen at birth or may not appear until later in life. Events that may trigger the onset of symptoms include puberty, pregnancy, insect bites, minor injuries, airplane trips, long car rides, or obesity.

Secondary lymphedema results from acquired damage to lymph vessels and/or nodes. Surgery, trauma, radiation therapy, malignancy, paralysis and obesity are a few of the many causes of damage to the lymphatic system. For example, a woman who has had a mastectomy with one or more lymph nodes removed, is at risk for developing lymphedema in the affected arm. Once the lymphatic system has been damaged, many of the same events that trigger symptoms in primary lymphedema can also bring about the onset of secondary lymphedema symptoms. These symptoms can

occur immediately after the initial injury, or months or years later.

Lymphedema severity is indicated by a three-level staging system<sup>1,2,5</sup>. In Stage I lymphedema, the skin is soft and indentations can be made in the swollen tissue by pressing it with a finger (pitting). The swelling usually subsides with elevation of the affected extremity, and worsens with heat, activity and high humidity. In Stage II lymphedema, swelling becomes more severe, resists pitting, and does not decrease when the limb is elevated. The skin



blood coming from the legs. The increased pressure in the veins and the lymph vessels increases the amount of fluid left in the tissues. Blood and lymph capillaries are also more fragile in obese patients, and the lymph vessels do not transport lymph as efficiently. Another factor in the development of lymphedema in obese patients is decreased ability to walk. The tissues depend on movement to help propel fluid into the lymph capillaries and to return blood from the veins in the legs. When patients become more sedentary, venous pressure increases, more fluid is pushed out of the bloodstream, and the lymphatic system is less efficient in removing the fluid from the tissues.

## Lymphedema Treatments

Lymphedema cannot be cured, but it can be effectively managed. Treatments for lymphedema have included pneumatic compression pumps, compression garments, surgery and diuretics (water pills). These techniques have had limited

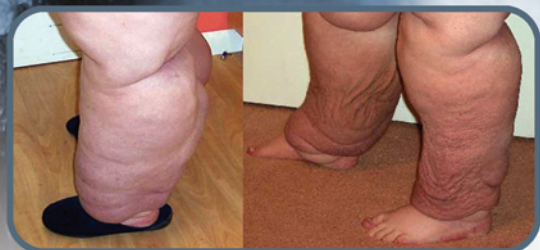
success and have caused many undesirable side effects<sup>1</sup>. The use of compression pumps, for example, is inconvenient and can cause genital edema. Also, many of the "debulking" surgeries cause increased edema in the affected extremity.

Currently, the most effective and least invasive approach in managing lymphedema is Combined Decongestive Therapy (CDT). There are four essential components of CDT. The first is hygiene and skin care, which are important to minimize the risk of bacterial and fungal infections. Manual Lymph Drainage (MLD), the second component, is a light massage technique that stimulates lymph flow and directs the fluid around congested areas and back toward circulation. Next, compression bandages, the third CDT component, are applied to prevent lymph fluid from re-entering the

also begins to develop fibrosis, a hardening and thickening of the tissue. Chronic inflammations and repeated fungal and/or bacterial infections are common in Stage II lymphedema. In Stage III lymphedema, also called lymphostatic elephantiasis, the edema is severe and non-pitting. Large skin folds are present, the skin is highly fibrotic and thickened, and may develop wart-like lumps and small lympho-cutaneous fistulas that leak fluid from the skin.

## Lymphedema and Obesity

Obesity is a risk factor for the development of lymphedema, especially in the legs. It can also trigger and/or exacerbate primary or secondary lymphedema. Obesity affects the lymphatic system in several ways<sup>3</sup>. The weight of the tissue, especially in the abdomen, obstructs the flow of lymph and



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affected arm or leg and to further assist the fluid in moving through the lymphatic system. The fourth essential component is exercise. The exercises are designed to increase muscle activity and stimulate lymph flow, and are done with the bandages on. Exercise programs are individualized and address any muscle or joint problems a patient may have.

During the intensive phase of therapy,



py, patients attend five two-hour therapy sessions per week. The number of weeks necessary for treatment will depend on the severity of the lymphedema and the amount of fibrosis present in the skin. As part of therapy, patients and their families are taught how to do all four CDT components for themselves, so that they can manage their lymphedema at home. Once the intensive phase of therapy is completed, patients begin their home management program, which consists of wearing a custom-fitted compression garment during the day, wearing self-applied bandages at night, performing daily exercises and performing MLD as needed.

The treatment of lymphedema in obese patients is complicated by the fact that they usually have other illnesses that must be considered before beginning treatment. Congestive heart failure, sleep apnea, diabetes, thyroid disease and degenerative joint disease are just a few of the problems that are associated with obesity and can make lymphedema treatment ineffective or even dangerous. In addition, because some of these conditions, such as congestive heart failure, can produce extremity swelling, differential diagnosis is essential in distinguishing lymphedema from other types of edema.

To be considered a good candidate for CDT, a person must be free of acute infec-

tions and be under medical management for conditions such as congestive heart failure, renal disease and bronchial asthma. CDT moves more fluid into the circulation, and a patient's heart and kidneys must be able to handle the extra volume without becoming overwhelmed. Other criteria that increase the chance of success with CDT include the ability of patients and their caregivers to attend daily therapy sessions and their self-motivation to manage the lymphedema at home after completion of phase I CDT.

In addition to therapy, diet is important in managing lymphedema associated with obesity. A dietitian can be helpful in developing a safe, effective diet plan to assist with weight loss. In addition, low-sodium, high-fiber diets are recommended since increased salt intake can increase edema. Although lymph fluid is high in protein, the protein is derived from the blood, not directly from the diet. Consuming less protein does not affect lymphedema and can have serious health consequences. At least one study has suggested that weight loss after gastric bypass surgery may help decrease lymphedema in obese patients.

## Lipedema

Lipedema is a disorder that is commonly misdiagnosed as either obesity or lymphedema<sup>1,2,3,5</sup>. This disease, sometimes called cellulite, primarily affects women and is characterized by the symmetrical accumulation of fatty tissue in both legs, from the hips to the ankles. Although it is less common, the arms can be involved as well. Symptoms of the disorder usually appear around puberty and include pitting edema that worsens with activity and heat. Lipedema can be distinguished from lymphedema by several characteristics. Unlike lymphedema, lipedema affects both legs equally and does not involve the feet. Also, people with lipedema bruise easily and are especially sensitive to touch and pressure on their legs. Cellulitis, the infection frequently seen in patients with lymphedema, is not seen in those with lipedema.

Lipedema can also be distinguished from obesity. Obesity is related to diet and results in more uniform distribution of weight in the trunk, arms and legs. In lipedema, fatty tissue is unequally distributed in the body, with most of the accumulation in the hips and legs. Because hormones are thought to play a role in the development of lipedema, dieting does not help lipedema patients lose the weight in their legs.

Correct diagnosis of lipedema is frequently complicated by the fact that it can be present along with lymphedema, obesity, or other disorders. In fact, untreated lipedema can lead to the development of lymphedema in the legs after many years. However, correct diagnosis is still important, especially for people considering gastric bypass surgery or liposuction. Because pure, uncomplicated lipedema (without lymphedema or obesity) is not affected by diet, it will not be improved after gastric bypass surgery. Liposuction is also not recommended, since it can damage the lymphatic system in the skin and lead to secondary lymphedema. **BT**

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