

Lymphedema in Multiple Sclerosis

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Lymphedema is the accumulation of lymphatic fluid in the interstitial tissue, resulting from a failure of the lymphatic system to return fluid to the circulation despite normal capillary filtration (Browse et al., 2003). In multiple sclerosis (MS) or other conditions that limit mobility, it most commonly manifests as swollen feet and ankles, and occurs because the lymphatic system does not receive help from the muscle movements that normally enable the lymphatic fluid to flow properly.

Mild lymphedema is usually treated by elevating the legs above the hips or wearing Jobst® supportive stockings. Until recently it was not recognized as a serious health problem. However, increased awareness of the risks of infection and poor wound healing are gradually causing healthcare professionals to treat this condition earlier and more aggressively (Badger et al., 2005; Gary, 2007; Moffatt et al., 2003).

ETIOLOGY

All edema is caused by capillary filtration exceeding lymph drainage. Some forms of lymphedema may be inherited; others are caused by injury to the lymphatic vessels. It frequently develops secondary to lymphatic system damage resulting from chronic overload, as in tissue damaged by advanced chronic venous disease. Lymphedema may also occur as a direct result of infections, neoplasms, allergic reactions, or thrombus formation; or secondary to surgery, trauma, burns, or radiation (Tiwari et al., 2003; Zuther, 2005).

Although it is important to rule out such conditions, patients with MS usually develop swollen feet and ankles as the result of mobility impairment. Under normal circumstances, contraction of the leg muscles helps keep the fluid moving in the lymphatic vessels as well as the veins, and propels it upward in the body. When limited mobility is present, gravity causes lymphatic fluid to accumulate in the lower extremities. Left untreated, this stagnant fluid not only causes tissue channels to increase in size and number, but also reduces oxygen availability in the transport system, interferes with

wound healing, and provides a culture medium for bacteria that can result in lymphangitis (inflammation of the lymph vessels) or cellulitis. This fluid can also predispose the patient to significant side effects from minor trauma and infection.

SIGNS AND SYMPTOMS

Lymphedema is usually painless, although patients may experience a “tight” feeling in the skin or a chronic, dull, heavy sensation in the leg(s). The affected limb will typically be discolored, swollen and hypertrophied; the skin may be thickened and fibrotic—often causing the individual concern about the cosmetic appearance. Swollen ankles and feet can interfere with activities of daily living and increase any existing difficulty with mobility. The swelling may be severe and constant, making it difficult to wear shoes. The problems increase during the summer because blood vessels and lymph channels dilate more when the temperature is higher.

DIAGNOSIS

It is important to identify the cause of lower extremity edema and to rule out the possible causes other than mobility impairment. A thorough patient history and physical examination are necessary. Lymphangiography and radioactive isotope studies may help in detecting the site of lymphatic obstruction. Generally the latter is not necessary in MS patients, in whom the cause is usually disuse of the lower limbs (Foldi et al., 2003).

A lymphedema clinic is the best choice for evaluation and treatment in more complex cases. The patient may also need to be seen by a vascular specialist to rule out other causes of the edema. If swelling occurred rapidly, especially in one leg, and is accompanied by redness and pain, it is imperative to rule out the possibility of phlebitis, which may lead to venous thrombus (Schapiro and Schneider, 2002). In this situation, vascular ultrasound (venous Doppler) is recommended to rule out deep vein thrombosis. Abdominal and pelvic ultrasound may be ordered, and CT scans or MRI may also prove useful.

Because extra fluid may accumulate in the body and pool in the ankles as the result of cardiac disease, it is especially important to rule out cardiac problems in patients whose primary sign is ankle swelling. In such cases, lymphedema may be accompanied by shortness of breath, coughing, and a general feeling of being unwell.

It is important to also rule out possible benign or malignant tumors, as well as liver and kidney disease.

Lymphedema is categorized as mild, moderate, or severe, and is progressive in nature (Penzer, 2003):

- ◆ **Stage 1—Pitting (mild):** When the tissue is pressed by the fingertips, the affected area indents and holds the indentation. Usually upon waking in the morning, the limb or affected area is normal or almost normal in size.
- ◆ **Stage 2—Non-pitting (moderate):** The tissue now has a spongy consistency and when pressed by the fingertips, the tissue bounces back without any indentation. Fibrosis found in Stage 2 lymphedema marks the beginning of the hardening of the limbs and increasing size.

- ◆ **Stage 3—Fibrosis (severe):** At this stage, swelling is irreversible and some fibrosis has occurred. There is a high risk of infection (Ward, 2006).

TREATMENT

The goals of lymphedema management are to prevent progression, to reduce and maintain limb size, to alleviate symptoms, to prevent infection, to improve mobility and the ability to perform ADLs, and to improve overall psychological well-being (Gary, 2007).

Elevation of the lower extremities is the first step in the management of lymphedema, either while sitting in a wheelchair or lying in the bed, with the back of the knees and calves supported by pillows. The edematous limb or limbs should be positioned higher than the hips if possible (Schapiro and Schneider, 2002).

Physical exercise will generally improve this clinical situation (Hanak, 1992). If the patient's skin is intact, relaxed swimming or aqua aerobics in a handicapped accessible pool are comfortable ways to reduce lymphedema. Unfortunately, the MS patient with lymphedema often cannot walk or has significant restriction of ambulation. Stretching exercises (with the edematous limb(s) higher than the hips) by a family member are helpful if the patient cannot exercise independently. This facilitates movement of the fluid back toward the trunk.

Some clinicians prescribe diuretics regardless of the cause of edema. However, diuretics are usually unsuccessful. Even when swelling is reduced, the fluid usually returns, and side effects make this a less viable option (Schapiro and Schneider, 2002). Specialized massage therapy (manual lymph drainage) may be helpful.

A compression pump system is easy to use and often covered by insurance. The system consists of a sleeve that is worn on the leg and fastened with Velcro to make it easier for the patient to use. It utilizes a short-duration, high-pressure cycle, providing a sequential "milking" pattern to the lower limbs through multiple compartments, causing fluid to move away from the distal area. The short cycle of the pressure allows the clinician to use high pressure in order to overcome even longstanding lymphedema without discomfort (Cavezzi et al., 1998).

To maintain the results achieved by the pump treatment, the patient must be committed to a regimen of elevation, skin care and the use of a graduated-compression stocking. The stocking or sleeve should be worn only when the lower limb is not being pumped.

SUMMARY

Everyone who cares for the more disabled person with MS needs to assess the lower extremities for edema, and refer him/her for diagnosis and therapy. This condition should elicit more attention than it has generally received to date, both in the MS literature and from those who care for mobility-impaired patients.

REFERENCES

- Badger C, Preston N, Seers K, et al. Physical therapies for reducing and controlling lymphoedema of the limbs. *Cochrane Database of Systematic Reviews* 2005; 2.
- Browse N, Burnand K, Mortimer P. *Diseases of the Lymphatics*. London: Arnold, 2003.
- Cavezzi A, Michelini S. *Phlebolympoedema: From Diagnosis to Therapy*. Bologna: P.R. Communications, 1998.
- Foldi M, Foldi E, Kubik S. *Textbook of Lymphology* (1st ed). Munchen, Germany: Elsevier, 2003.
- Gary DE. Lymphedema diagnosis and management. *J Am Acad Nurse Practitioners* 2007; 19:72–78.
- Hanak M. *Rehabilitation Nursing for the Neurological Patient*. New York: Springer Publishing Company, 1992.
- Moffatt CJ, Franks PJ, Doherty DC, et al. Lymphoedema: An underestimated health problem. *Quarterly Journal of Medicine* 2003; 96(10):731–738.
- Penzer R. Lymphoedema. *Nursing Standard* 2003; 17(35):45–51.
- Schapiro RT, Schneider DM. Symptom management in multiple sclerosis. In Halper J, Holland NJ (eds), *Comprehensive Nursing Care in Multiple Sclerosis* (2nd ed). New York: Demos Medical Publishing, 2002.
- Tiwari A, Witte MR, Unger BC, et al. Differential diagnosis, investigation, and current treatment of lower limb lymphedema. *Archives of Surgery* 2003; 138:152–161.
- Ward LC. Bioelectrical impedance analysis: Proven utility in lymphedema risk assessment and therapeutic monitoring. *Lymphatic Research and Biology* 2006; 4(1):51–56.
- Zuther JE. *Lymphedema Management: The Comprehensive Guide for Practitioners*. New York: Thieme, 2005.

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