

What's New in Lymphedema: The Fibrosis Connection

FIBROSIS IN LYMPHEDEMA

Lymphostatic fibrosis is a progressive hardening of the skin that occurs in all patients with lymphedema. In the early stages of lymphedema, the edema is soft. But as time goes on, connective tissue fibers start to develop in the skin and under it. This "fibrosis" gradually replaces normal tissue, making the skin and tissue hard, woody and inflexible. Lymphedema is "staged" according to the presence of fibrosis and the skin changes it causes.

WHY LYMPHOSTATIC FIBROSIS FORMS

At this time, we do not have a complete understanding of the mechanism by which lymphostatic fibrosis forms and develops. The most current evidence shows that fibrosis is caused by inflammation.

When cells and vessels are damaged, the body responds with inflammation. Chronic edema damages cells as well as lymph vessels, and this causes inflammation. During inflammation, the body produces collagen fibers in the injured area, to replace damaged structures. The fiber buildup is supposed to end after the damage is healed. However, in the case of lymphedema, the chronic edema remains, causing more cell and vessel damage and inflammation and preventing the

UNTREATED, LYMPHEDEMA WILL GET WORSE.

Stage 0 Lymphedema



(Non-Visible, Latency)

In Stage 0, there is no visible swelling, because the tissue fluid hasn't accumulated to stretch the skin. There can be a feeling of tightness or heaviness.

Stage 1 Lymphedema



(Spontaneously Reversible)

In Stage 1, the hand or foot (farthest point on the limb) may appear "puffy." Pressing the skin may leave a dent ("pitting edema"), indicating the edema fluid is starting to thicken as collagen

"stop signal" from ending the process.

Gradually fibrosis replaces normal tissue and the area becomes hard and woody. Fibrosis also damages and destroys lymph vessels, worsening the lymphatic drainage from the affected area.

CAN LYMPHATIC FIBROSIS BE PREVENTED?

The progression of lymphostatic fibrosis can be stopped by removing the edema that drives the inflammatory process. Massage, bandaging, exercise and Lympha Press® treatments increase lymph vessel function to drain edema from the area. If the local lymph vessels have been destroyed, the treatments move the edema to areas with healthy lymph vessels for absorption.

THE BEST WAY TO TREAT LYMPHOSTATIC FIBROSIS IS BY APPLYING TREATMENT IN EARLY STAGES OF LYMPHEDEMA, BEFORE DAMAGE IS IRREVERSIBLE.

Early, effective treatment is important to prevent or minimize fibrosis development. It is best to use Lympha Press® at home as soon as possible, especially if clinic visits are limited.

If the tissue is already hard and fibrous (woody), it cannot be returned to its previous state. However, treatment can make the skin and tissue more flexible, and remodel it to improve lymph drainage, mobility, and limb function.

OTHER TYPES OF FIBROSIS ENCOUNTERED IN LYMPHEDEMA THERAPY

Surgical fibrosis is scar tissue that forms at an incision site. It can be superficial, or go deeper if

fibers form.

Stage 2 Lymphedema



(Spontaneously Irreversible)

Swelling is spongy instead of puffy, because the connective fibers of **fibrosis** are developing in the edema. The liquid becomes more like a gel. The edema becomes firmer as the connective tissue network continues to grow. Eventually, pressing the edema with a fingertip does not leave a dent ("non-pitting edema"). Some changes are permanent, but the swelling can be reduced with treatment.

Stage 3 Lymphedema



(Lymphostatic Elephantiasis)

The skin becomes hard and the limb has a woody texture. The liquid edema has been replaced, to some extent, by connective tissue and associated fat deposits. The limb may be very large, with folds, lobules and openings that leak lymph fluid.

From: National Lymphedema Network.

the surgeon needs to "tunnel" under the skin.

Radiation fibrosis is caused by radiation tissue damage.

Cording, also known as "axillary web syndrome," is caused by breast cancer surgeries.

Post-cellulitis fibrosis is common in patients with chronic venous insufficiency lymphedema (phlebo-lymphedema).

These types of fibrosis create hard scar tissue that can block lymph vessels and prevent lymph drainage. It is important to treat these areas, so that lymph drainage won't be obstructed, and to improve the patient's range of motion.

MANUAL TREATMENT OF FIBROSIS

Lymphedema therapists use special techniques of MLD to soften fibrosis. They may place foams of different firmness under bandaging, or insert cloth bags filled with foam pieces, under compression garments to apply extra compression.

LYMPHA PRESS® TREATMENT SETTINGS ARE ADJUSTABLE, TO TREAT FIBROSIS.

Higher pressure settings may be needed over fibrotic areas, as the harder skin surface resists compression. However, treatment should always be comfortable. The patient's medical professional assesses factors such as skin integrity and comfort before deciding on a pressure level, as some patients may have fragile skin or painful areas. Once the edema is reduced and skin softened, the treatment pressure can be lowered.

See the Lympha Press® treatment protocol for recommended settings for fibrosis.

Examples of inserts used by therapists under bandaging to soften fibrotic tissue



Fibrotic legs before and after Lympha Press® treatment



Lymphedema Stage 2 (early fibrosis) before treatment (in clear Lympha Press® sleeve) and during treatment with Lympha Press®, using near-infrared fluorescent imaging. Green lines are lymph fluid moving through lymph vessels. The treatment is increasing lymph vessel flow and speed.

