

LYMPHEDEMA

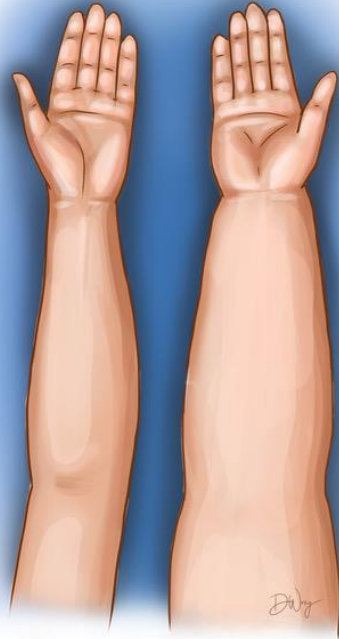


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About Lymphedema

What is Lymphedema?

The lymphatic system plays a crucial role in our bodies, helping to circulate lymphatic fluid and filter out waste and toxins. Lymphedema occurs when the lymphatic vessels or nodes are damaged, obstructed, or removed, hindering the normal flow of lymphatic fluid. This disruption causes swelling, typically in the arms or legs, although it can affect other parts of the body as well.

Causes:

1. **Primary Lymphedema** – often due to genetic factors affecting the development of the lymphatic system. In these cases, the lymphatic system is intrinsically compromised.
2. **Secondary lymphedema**- more common and can often result from surgeries, radiation therapy, trauma, parasite, or other extrinsic conditions that damage the lymphatic system.

Symptoms:

The hallmark symptom of lymphedema is persistent swelling, which may range from mild to severe. Other common symptoms include a feeling of heaviness or tightness in the affected limb, decreased flexibility and recurrent infections.

Management:

While there is no cure for lymphedema, effective management strategies can significantly improve the quality of life for those affected.

1. **Compression Therapy:** custom fitted compression garments, such as sleeves or stockings, help promote lymphatic fluid drainage and reduce swelling
2. **Lymphedema Therapy:** Manual Lymphatic Drainage (MLD), a technique to stimulate the flow of lymphatic fluid
3. **Exercise:** Regular exercise and weight management can promote lymphatic circulation and alleviate symptoms
4. **Lifestyle Modifications:** Maintenance of good hygiene and skin care is crucial to prevent infections. Elevating the affected limb when possible and avoiding prolonged periods of inactivity can help manage swelling.
5. **Surgical Interventions:** Various surgical procedures are available to aid in improving lymphedema symptoms in patients who have been medically optimized in the above parameters.

About Lymphedema

Surgical Management of Lymphedema:

Surgical procedures offer an additional adjunct to help alleviate symptoms of lymphedema. There are several surgical options available that can be offered, and these include **liposuction**, **lympho-venous bypass (LVB)**, and **vascularized lymph node transplant (VLNT)**.

Liposuction focuses on the targeted removal of abnormal fatty deposits that can develop over time with lymphedema. This can be performed with or without removal of excess skin and aims to provide symptom relief with improvement in overall mobility.

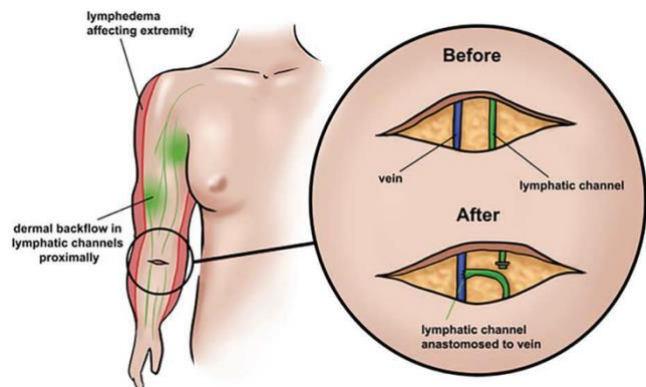
Lympho-Venous Bypass (LVB) involves the creation of small connections between blocked lymphatic vessels and nearby veins. These surgeries involve relatively small incisions and a quicker recovery period.

Vascularized Lymph Node Transplant (VLNT) is a surgical procedure by which the surgeon transplants healthy lymph nodes, along with their blood vessels, from one part of the body to the affected area. The transplanted nodes help establish a new network for fluid drainage, and improve lymphedema symptoms. There are number of different donor sites available that the surgeon may choose to harvest lymph nodes from. These surgeries typically require a hospital stay and a longer recovery period.

In some cases, the surgeon may recommend a combination of the above techniques to maximize effectiveness. This could involve a multi-step approach, such as combination of lympho-venous bypass and VLNT, tailored to the patient's specific needs.

Lympho-Venous Bypass

During a **Lympho-Venous Bypass** (LVB), the surgeon will create tiny connections, or bypasses, between the blocked lymphatic channels and nearby veins. These bypasses act as alternate routes, allowing excess fluid to find its way back into the bloodstream, and reducing swelling. The surgery involves small incisions through which the bypasses are performed. These generally heal with minimal scarring.



ICGN Lymphography:

Not all patients are candidates for lympho-venous bypass. To determine if you are a candidate, your surgeon will schedule you for an **Indocyanine Green (ICGN) lymphography** procedure in the office or the operating room. This procedure takes 5-10 minutes and allows the surgeon to determine if you have any lymphatic channels that are available for bypass.

After Surgery

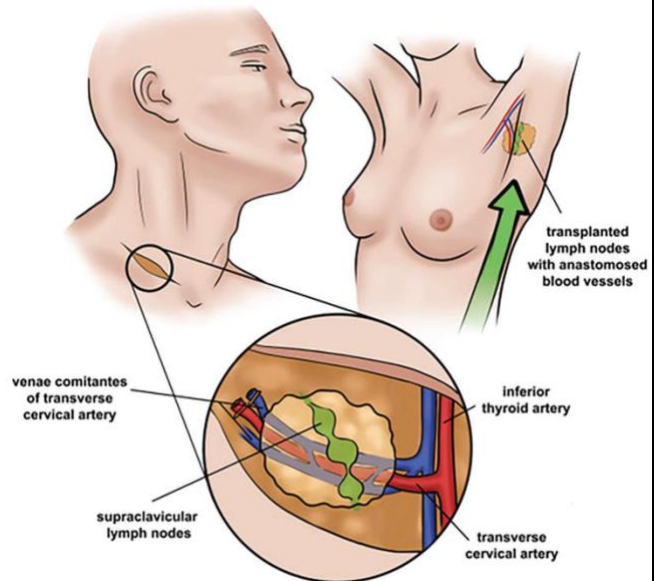
After LVB surgery, you can go home on the same day, and return to normal activities approximately 2 weeks after surgery. If you have additional procedures performed, you may need to stay in the hospital longer and your recovery time may be longer.

You will need to wrap your affected extremity for four weeks, and keep it elevated as much as possible. After four weeks, you will transition to a compression garment.

Supraclavicular Flap Surgery

This surgery is a type of vascularized lymph node transplant that involves harvest of lymph nodes with their blood supply from the neck.

The lymph nodes are generally harvested from the right neck and transplanted to the affected extremity. During the surgery, the blood vessels are reconnected at the recipient site to re-establish blood flow to the tissue.



This procedure is more commonly performed on patients with lower limb lymphedema, but in certain cases can be offered to patients with upper limb disease.

The surgery takes about 2-4 hours. After surgery, you will stay in the hospital for ~3 days to monitor the tissue. You will need to wrap your affected extremity for four weeks, and keep it elevated as much as possible. After 4 weeks, you will transition to a compression garment. It often takes about 4 weeks for a full recovery and return to day to day life.

Side Effects

Patients will have a scar in the neck just above the clavicle. These scars typically fade with time and are generally well accepted from a cosmesis standpoint.

Risks

The biggest risk of surgery is **total flap loss**. This happens when the blood flow to the transplanted tissue stops, and we are unable to fix it, and the tissue dies (necrosis). This is very rare and occurs in < 1% of patients on average.

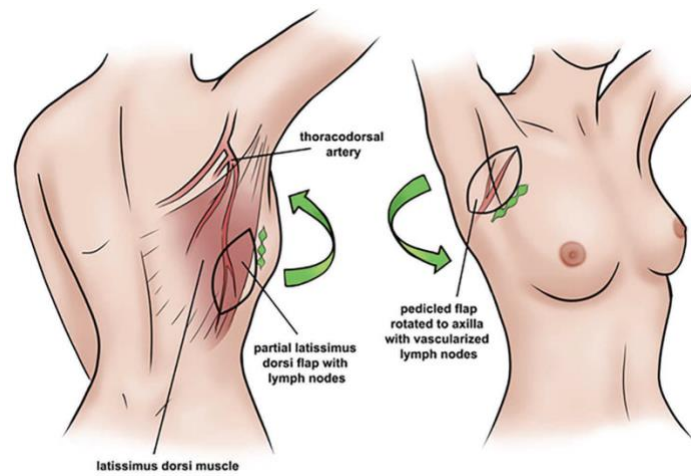
Other risks include **chyle leak**, defined as an abnormal leakage from the lymphatic system of a milky fluid containing dietary fats and immune cells. This is very rare and occurs in 1-2% of patients. It is usually managed with dietary modifications, and rarely, surgical intervention.

Latissimus Dorsi Flap Surgery

The **latissimus dorsi flap**, also known as the **lateral thoracic VLNT**, is a procedure where skin, muscle and lymph nodes are taken from the back and moved to the affected area.

This procedure is generally selected in patients with a history of breast cancer and upper extremity lymphedema after axillary lymph node

dissection. When performed for this reason, the tissue stays connected to the body and blood supply during and after surgery.



The surgery takes about 2-3 hours with a hospital stay of approximately 1 night. You will need to wrap your affected extremity for four weeks after surgery, and keep it elevated as much as possible. After 4 weeks, you will transition to a compression garment. It often takes about 4 weeks for a full recovery and return to day to day life.

Side Effects

Patients will have an oblique (slanted) scar within the bra line on the back where the tissue is taken.

Because only a small portion of the muscle is moved from the back, most people do not have may loss of motion. Some patients may initially experience some weakness in their shoulders, but this generally resolves.

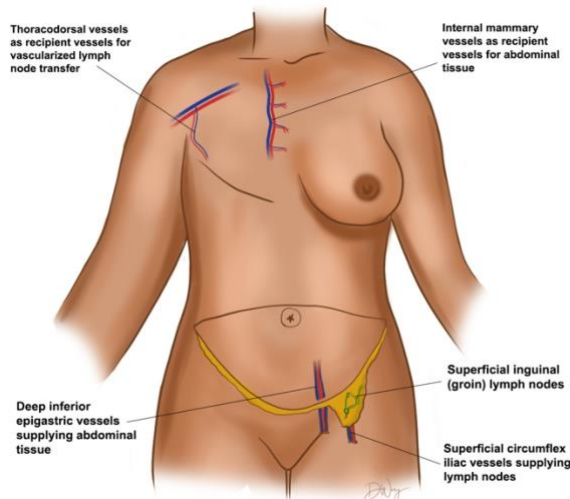
Risks

Donor site (back) seroma: A collection of fluid in the space where the portion of muscle was removed.

Total Flap Loss: Very rare. More likely if the tissue needs to be reconnected at a distant site, rather than just moved while remaining attached to the body.

Abdominal/Groin Flap Surgery

Patients with a history of breast cancer treated with mastectomy and axillary lymph node dissection with subsequent development of lymphedema may be candidates for combined breast reconstruction and lymphedema surgery.



This surgery takes tissue (skin, fat, and possibly some muscle) from the abdominal area, together with lymph nodes from the groin and transplants it to replace the missing axillary lymph nodes and to rebuild the breast. For the transplanted tissue to survive, the surgeon re-attaches blood vessels from the transplanted tissues to blood vessels in the chest and armpit.

Surgery can take from 4-8 hours. Surgery for 2 breasts can take 8-14 hours. After surgery, you will stay in the hospital for ~3 days. It often takes about 4-6 weeks for a full recovery.

Side Effects

Patients will have a scar across the belly and around the belly button where the tissue is taken. This is often compared to a “tummy tuck” scar.

Because a small portion of muscle may need to be removed for this procedure, some patients may initially experience some weakness in their abdomen, but this generally resolves.

Risks

Total flap loss: This happens when the blood flow to the transplanted tissue stops, and we are unable to fix it, and the tissue dies (necrosis). This is very rare and occurs in < 1% of patients on average.

Donor Site (Lower Extremity) Lymphedema: Very rare. We avoid this in the operating room by identifying and preserving the primary lymph nodes responsible for drainage at the groin.

Lower Abdominal Wall Laxity: About < 10% of patients have looseness or bulge of the abdominal wall. People who smoke or are obese are at higher risk.

Omental Flap/Mesenteric VLN Surgery

The omentum is a fold of tissue that covers and supports the organs inside the abdomen, and is rich in blood and lymphatic vessels. In select cases, the omentum or mesenteric lymph node can be used as a donor site for lymphedema surgery.

During the surgery, the omentum/mesenteric lymph node may be harvested with its blood supply and transplanted to the affected area where the lymphatic system is compromised. For the transplanted tissue to survive, the surgeon re-attaches blood vessels at the recipient site.

The omentum may be harvested in a number of ways:

- 1) **Open:** This involves a larger vertical incision in the upper abdomen through which your surgeon will access and harvest the omentum.
- 2) **Robotic assisted:** Performed with the assistance of a general surgeon. Advanced surgical technique that uses small incisions and a surgical robot to access and harvest the omentum.

Surgery can take from 4-8 hours. After surgery, you will stay in the hospital for 3-7 days. It often takes about 4-6 weeks for a full recovery and return to day to day life.

Side Effects

Depending on the harvest technique, you will have one midline scar (open technique) on your belly or multiple small scars (laparoscopic or robotic assisted) on your abdomen.

Risks

Ileus: Due to some manipulation of the intestines, you may have some slowing of your gastrointestinal tract, resulting in nausea and/or constipation after surgery.

Bowel Injury: This is rare. Harvest of the omentum/mesenteric node involves careful dissection around your abdominal organs, including your stomach and intestines.

Ventral (Abdominal) Hernia: This is rare. This is when a part of the intestine or other tissue protrude through a weakness or gap in the abdominal wall.

Liposuction

As lymphedema progresses, chronic fluid accumulation may result in fat deposition in the affected extremity. This accumulated fat is best addressed by means of liposuction, a procedure designed to target the excess fat deposits contributing to extremity swelling. During the procedure, your surgeon will use small incisions to insert a thin tube (cannula) to suction out the excess fat.

Depending on how much fat needs to be removed, the procedure takes 1-3 hours. Generally, patients can go home the same day, but with more extensive liposuction, some patients will spend one night in the hospital. Sometimes, excess skin is also removed at the same time to help reduce the circumference of the limb, and to improve mobility and functionality of the involved extremity.

After surgery you will need to wear compressive garments 24/7 in order to maximize the benefits of the procedure.

Side Effects

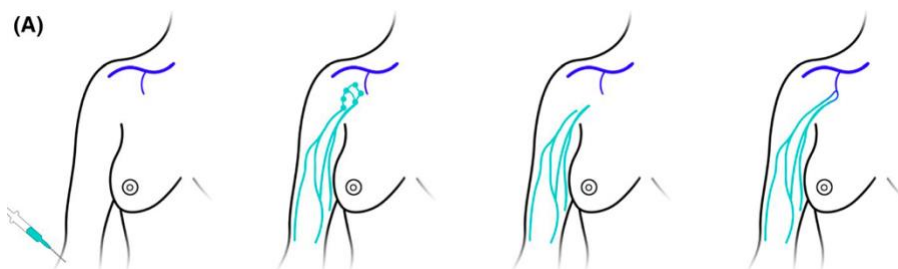
You can expect to have bruising and swelling at the liposuction sites. This will subside after several days.

Risks

Contour Deformity: The shape of the limb will change with liposuction. Generally, this change in shape is uniform, but occasionally, patients can have localized areas of irregularities.

LYMPHA

Select patients will be referred to plastic surgery for the Lymphatic Microsurgical Preventative Healing Approach (LYMPHA) procedure, a preventative technique for lymphedema. These patients will typically be undergoing removal of all of the lymph nodes of a given area (lymph node dissection), for example, the armpit or the groin. In these cases, your plastic surgeon will coordinate with your cancer surgeon, and will attempt to do a **lympho-venous bypass** (see page 4) at the time of your lymph node dissection.



Prior to your node dissection, a blue dye will be injected to map the lymphatic circulation from your extremity. This will help your plastic surgeon to identify the lymphatic channels that are cut during your node dissection, and they will then reconnect them to a nearby vein. The goal is to reduce the risk of lymphedema development in that limb in the future.

Studies have shown that while LYMPHA **reduces** the risk that a patient will develop lymphedema, LYMPHA **does not eliminate** the risk entirely. Despite best efforts, some patients unfortunately will still go on to develop lymphedema.

The LYMPHA procedure adds approximately 30 minutes to your planned surgery, and should not impact your hospital stay or recovery time.