

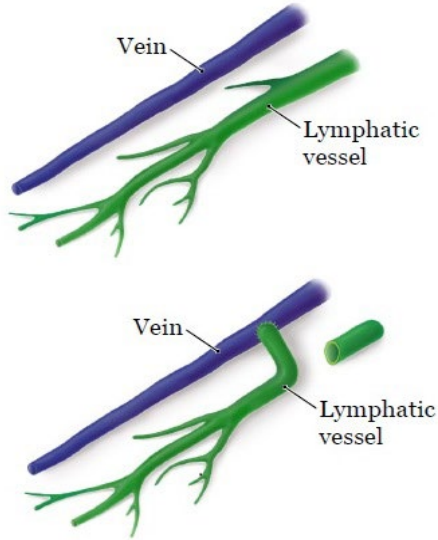
Lymphatic Bypass

ICD-10 Coordination and Maintenance
Committee
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Background



The goal of this procedure is to re-establish normal outflow of lymphatic fluid via a bypass between a lymphatic vessel and a local vein to treat or prevent lymphedema.

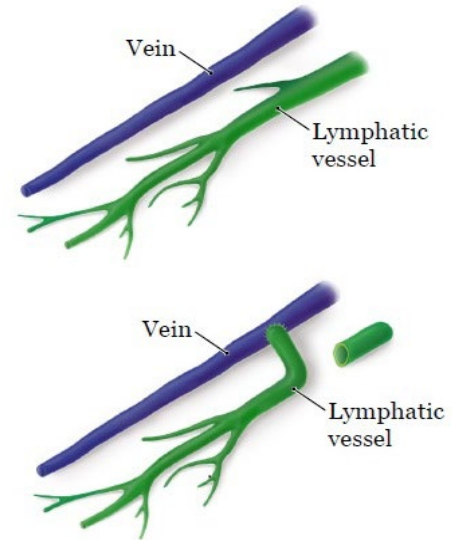
“Lymphedema is the acculumation of protein-rich fluid in the interstitial spaces resulting in impairment in the lymphatic circulation that can impair quality of life and cause considerable morbidity.”
(Forte et al.)

What Does It Do?

This procedure re-routes lymphatic fluid from the damaged lymphatic vessel into the venous blood system.

The lymphatic vessel is shown here in green and the vein is shown here in blue.

This image shows the end-to-side anastomosis that is done with superfine microsurgical instruments and microsutures.



How Is It Used?

Lymphovenous bypass is done to either treat lymphedema or to help prevent lymphedema from developing.

Once lymphedema develops, it is extremely difficult to treat because the area enlarged by the “drowning” of interstitial tissue from leakage, rarely, if ever, returns to the size it was prior to the original surgery.

Therefore, physicians have developed a way to determine which patients are at increased risk for lymphedema. This set of patients has the bypass performed along with the main procedure.

Basic Steps



Assessment of lymphatic and venules

Indocyanine green dye is injected to determine pathways that can be used for bypass.



Anastomosis with operating microscope

Direct connection anastomosis (without a device) is performed. The end-to-side or the “dunking” method is used. This may be repeated for multiple bypasses.



Anastomosis Assessed

Each anastomosis is assessed by injecting isosulfan blue dye. If necessary, more sutures are added. If no leakage, the procedure is complete.

Detailed Procedural Steps

1. Indocyanine green dye is administered into the lymphatic vessels to determine pathways that can be used to create a bypass.
2. Local venules are assessed to determine compatible sizing.
3. Direct anastomosis is made between the remaining lymph pathways and the suitable local venules.
4. Either the end-to-side anastomosis or the “dunking” method (pushing lymphatic vessel into venule and sewing around it) is used to create the bypass. The operating microscope is used to place the stitches.
5. The patency of the anastomosis is then checked and any leakage repaired.

Prevalence of Mastectomies

≈100,000

Total US Annual
Mastectomies

71%

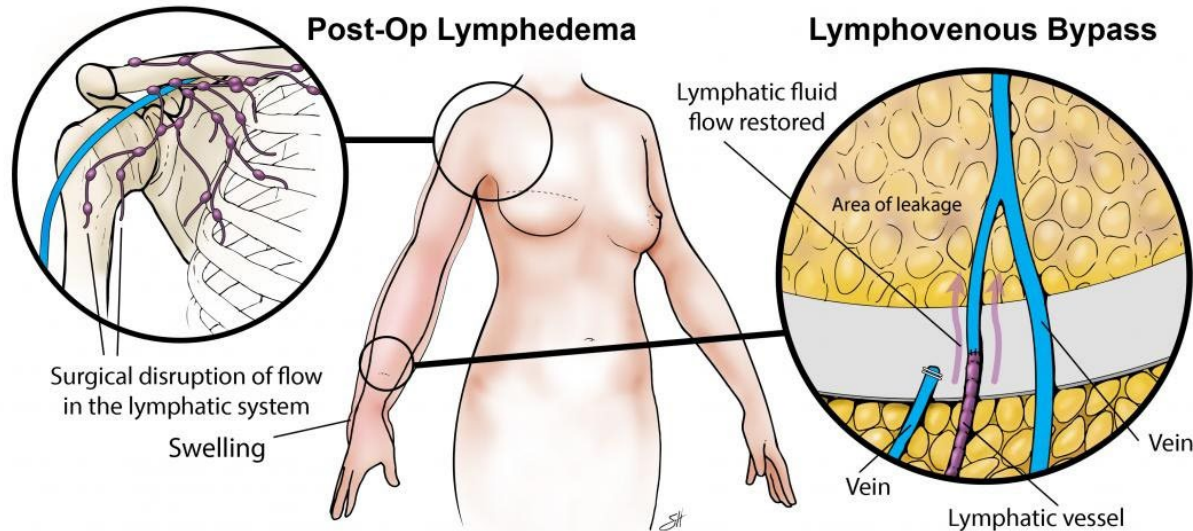
Modified Radical

2%

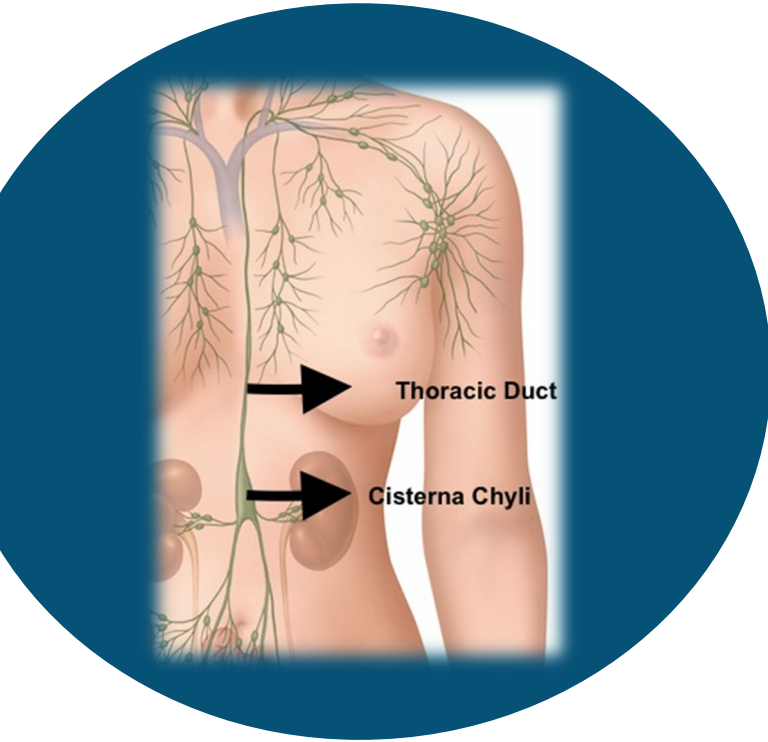
Radical

Post-Operative Lymphedema

To treat the lymphedema or prevent it, multiple anastomoses may be required to completely eliminate the excess lymphatic fluid in the tissue of the extremity. The image in the right circle shows an end-to-end anastomosis.



Large Lymphatic Ducts Can be Bypassed



The thoracic duct and the cisterna chyli can be damaged during surgery, as a result of trauma or due to growth of a malignant tumor.

These large lymphatic ducts can be bypassed to larger upper or lower veins. The superior or inferior vena cava are the most common sites for bypass, with the subclavian veins also often used.

Inpatient or Outpatient?

This procedure began as an outpatient procedure to treat lymphedema after it has developed and can still be done that way, perhaps months after the original surgery.

However, within the last several years, it has become a prophylactic procedure, performed at the time as a radical or modified radical mastectomy, which both include lymph node excision or resection.

This is commonly performed on females in association with mastectomy in the inpatient setting. The procedure is also done for males in association with radical prostatectomy to restore pelvic or inguinal lymphatic pathway. Both of these are done at the time of the main surgery in the inpatient setting.

Procedures to treat lower extremity lymphedema are typically still performed in the outpatient setting, unless accompanied by significant co-morbidity.

The only reported adverse effect of this procedure is the spontaneous occlusion of the anastomosis over time.

Diagnoses Associated With Procedure

I31.39, Other pericardial effusion
(chylopericardium)

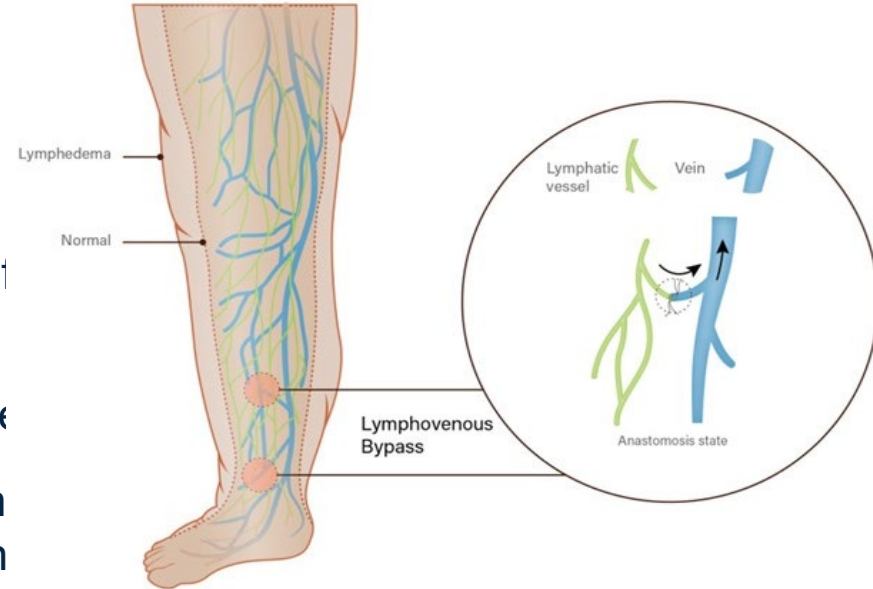
I89.0, Lymphedema, not elsewhere classified

I89.8, Other specified noninfective disorders of
lymphatic vessels and lymph nodes

I97.2, Postmastectomy lymphedema syndrome

I97.89, Other postprocedural complications and
disorders of the circulatory system, not elsewhere
classified

J94.0, Chylous effusion



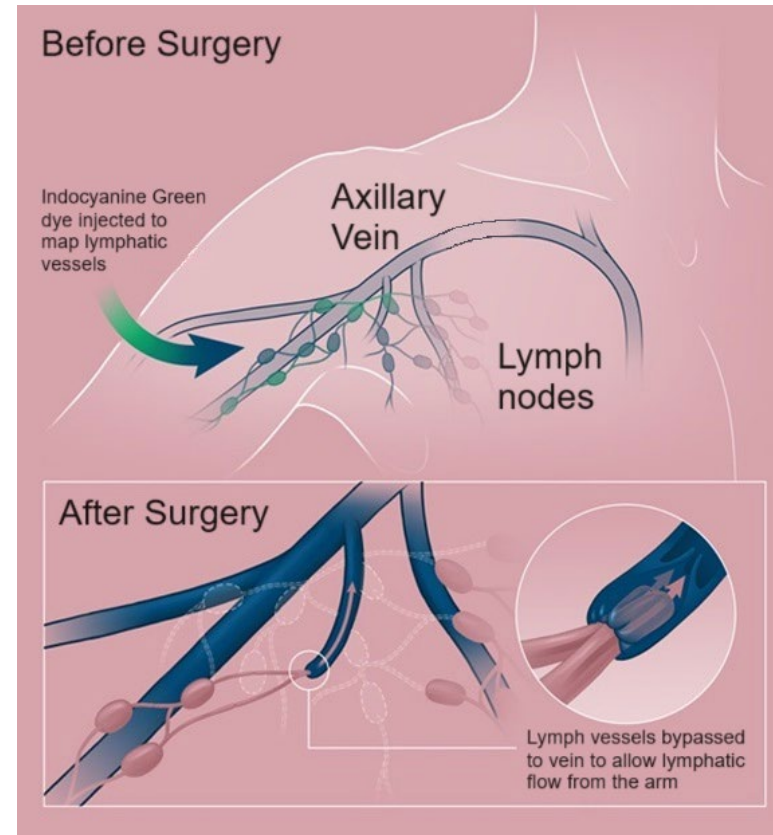
Documentation

Located in the operative report

Common Names are:

- ✓ Lymphovenous Bypass (LVB)
- ✓ Lymphovenous Anastomosis (LVA)
- ✓ Lymphovenous Shunt
- ✓ Lymphaticovenular Anastomosis
- ✓ Microsurgical Lymph Bypass

This is not a vascularized lymphatic “transfer” which uses a free graft of lymphatic tissue.



Resources

Learning about Lymphovenous Bypass Surgery

<https://my.clevelandclinic.org/podcasts/butts-and-guts/learning-about-lymphovenous-bypass-surgery>

Lymphovenous Bypass

<https://www.northwell.edu/plastic-surgery/procedures/lymphaticovenous-anastomosis-for-lymphedema>

Lymphaticovenous Anastomosis for Lower Extremity Lymphedema

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7192660/>

Lymphaticovenular Anastomosis for breast cancer-related upper extremity Lymphedema

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7225471/>

Microsurgical Lymphovenous Bypass of the Thoracic Duct

<https://www.pennmedicine.org/for-health-care-professionals/for-physicians/physician-education-and-resources/clinical-briefings/2023/april/microsurgical-lymphovenous-bypass-of-the-thoracic-duct#main>