



Multidisciplinary Approaches to Cancer Symposium

Lymphedema Management

Sherry Hite, MOT, OTR/L, FAOTA
Jeff Chang, MD., M.S.

Disclosures

Sherry Hite, MOT, OTR/L, FAOTA
Director, Rehabilitation Services
City of Hope

- *No relevant financial relationships*

Jeff Chang, MD, MS
Assistant Professor Division of Plastic Surgery
Program Director for Reconstructive Microsurgery Fellowship
City of Hope

- *No relevant financial relationships*

This presentation and/or comments will provide a balanced, non-promotional, and evidence-based approach to all diagnostic, therapeutic and/or research related content.



Cultural Linguistic Competency (CLC) & Implicit Bias (IB)

STATE LAW:

The California legislature has passed Assembly Bill (AB) 1195, which states that as of July 1, 2006, all Category 1 CME activities that relate to patient care must include a cultural diversity/linguistics component. It has also passed AB 241, which states that as of January 1, 2022, all continuing education courses for a physician and surgeon **must** contain curriculum that includes specified instruction in the understanding of implicit bias in medical treatment.

The cultural and linguistic competency (CLC) and implicit bias (IB) definitions reiterate how patients' diverse backgrounds may impact their access to care.

EXEMPTION:

Business and Professions Code 2190.1 exempts activities which are dedicated solely to research or other issues that do not contain a direct patient care component.

The following CLC & IB components will be addressed in this presentation:

- *Social and cultural risk factors for Lymphedema occurrence.*
- *Racial disparities in Lymphedema incidence.*
- *Access to lymphedema care especially surgery is limited in rural areas due to lack of knowledge and resources.*
- *Not all obese patients with swollen extremities is due to deposition of excess adipose tissue.*



What Is Lymphedema?

- Secondary lymphedema: Damage or obstruction to a previously normal lymphatic system
- Primary lymphedema: Genetic or developmental abnormalities
- An estimated 250 million people are living with lymphedema worldwide

Primary Causes

- Cancer treatment (lymph node dissection or radiation) is the leading cause in developed countries



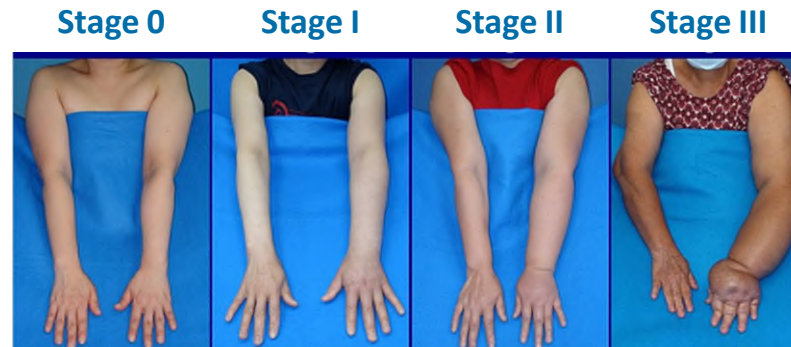
Stages of Lymphedema

Stage 0 – Swelling not evident, despite impaired lymph transport

Stage I – Early onset; accumulation of fluid that resolves with elevation of the limb

Stage II – Limb elevation no longer reduces swelling; pitting may be present early but often progresses to non-pitting fibrosis

Stage III – Tissue is fibrotic, pitting absent; skin changes such as thickening, hyperpigmentation, and fat deposits



Lymphedema Incidence

Cohort of 1,815 patients with invasive breast cancer (2005-2018)

Axillary Surgery Type	5-Year Cumulative BCRL Incidence
ALND + Regional Lymph Node Radiation (RLNR)	30.1%
ALND alone	24.9%
SLNB + Regional Lymph Node Radiation (RLNR)	10.7%
SLNB alone	8.0%

9.5%

Immediate lymphovenous anastomosis (LVA) after ALND

1.8%

No axillary surgery (INSEMA omission arm)



Lymphedema Disparities

Incidence

- Black patients have **4x higher odds** of BCRL than White patients
- Hispanic patients have **3x higher odds** of BCRL than White patients
- BCRL rate is **16% vs 4%** in the most vs. least deprived neighborhoods

Outcomes

- Black, Hispanic, and Asian women report **more arm swelling** than White women after ALND
- Medicare/Medicaid insured women report **worse quality of life** than privately insured women

Adherence & Access

- Fewer than **12% of insured patients** have access to compression and surgical treatment nationally
- A review of **39 studies** found education gaps and self-management burden remain key barriers to BCRL care





**SURVIVOR AT RISK
FOR LYMPHEDEMA**

SCREENING^a

Survivor
at risk for
lymphedema

- Inquire at regular intervals about:
 - ▶ Swelling or feeling of heaviness, fatigue, or fullness
 - ▶ Frequency and severity of swelling
 - ▶ Swelling, tightness, or uncomfortable sensation that interferes with daily activities
 - ▶ Pain/discomfort
 - ▶ Range of motion and mobility (ie, bending, stretching, flexibility)
 - ▶ Strength
- Perform clinical examination which may include, but is not limited to:
 - ▶ Range of motion
 - ▶ Muscle performance
 - ▶ Circulation
 - ▶ Sensation
 - ▶ Hemodynamic functioning
 - ▶ Functional mobility
- If available, obtain comprehensive objective measurements to identify early signs of lymphedema^b

- Refer to certified lymphedema therapist (if available)^c for consideration of the following:

▶ **Compression^f**

- ◊ Fit for compression garments
- ◊ Review use of garments
- ◊ Pneumatic compression for ongoing home management
- ◊ Review use of multilayered bandage wrapping

▶ **Progressive resistance training under supervision^{g,h}**

▶ **Manual lymphatic drainage^{c,i}**

- Refer to qualified therapist for range-of-motion exercises^j

- Consider early referral to a lymphedema surgeon, in consultation with a certified lymphedema therapist and/or physiatrist specializing in lymphedema

TREATMENT^e

Survivor lymphedema education, including self-care management, skin care, and self-bandage ([LYMPH-A](#))

Refer to certified lymphedema therapist (if available)^c for consideration of the following:

- ▶ Compression^f
 - ◊ Fit for compression garments
 - ◊ Review use of garments
 - ◊ Pneumatic compression for ongoing home management
 - ◊ Review use of multilayered bandage wrapping
- ▶ Progressive resistance training under supervision^{g,h}
- ▶ Manual lymphatic drainage^{c,i}

Refer to qualified therapist for range-of-motion exercises^j

Consider early referral to lymphedema surgeon, in consultation with a certified lymphedema therapist and/or physiatrist specializing in lymphedema

Surveillance ([SLYMPH-4](#)) or
If no response, but persistent symptoms, consider reviewing adherence to treatment plan and/or self care management

Complete Decongestive Therapy

COMPONENTS OF CDT BY PHASE

PHASE 1 – INTENSIVE (DECONGESTIVE)

- 1 Examination
- 2 Manual Lymphatic Drainage
- 3 Compression Bandaging
- 4 Decongestive Exercise
- 5 Skin Care

PHASE 2 – MAINTENANCE

- 1 Compression Garments
- 2 Self-Management
- 3 Ongoing Education

EVIDENCE SUPPORTING CDT AS STANDARD OF CARE

45%

Mean reduction in excess limb volume with compression therapy, in the largest pooled analysis to date

66%

Average reduction in excess limb volume after the intensive phase of CDT

29% vs 23%

Mean reduction in excess arm volume with CDT vs. compression alone in a landmark RCT

Full CDT Superior

Complete CDT protocols achieved greater volume reduction than those omitting components



Phase 1: Manual Lymph Drainage and Bandaging

Manual Lymph Drainage

- Very light pressure and long, gentle, rhythmic strokes
- Promotes lymph to drain out of an affected limb into an area of the body that drains normally

Compression Bandaging

- Multi-layered, low-stretch bandages applied over the affected limb
- Helps lymph fluid continue to drain and prevents it from building back up between sessions

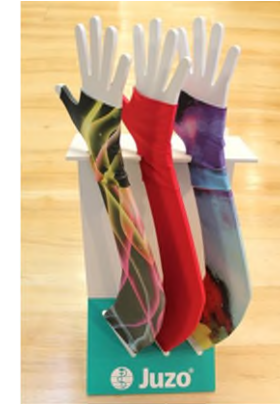


Phase 2: Compression Garments

Phase 2: Maintenance

Garments are used when the limb is decongested and volume changes are minimal.

They replace multilayer bandaging as the long-term, patient-applied compression method, worn during the day to maintain limb volume.



Lymphedema Treatment Act

Effective January 2024

WHAT'S COVERED

3 Daytime, 2 Nighttime

Garments covered per affected body part: 3 daytime garments every 6 months, 2 nighttime garments every 2 years

No Set Limit

Bandaging supplies and accessories (donning aids, padding, fillers, zippers) are covered with no fixed quantity cap, based on medical necessity

REIMBURSEMENT REQUIREMENTS

Diagnosis + Rx Required

Requires a confirmed lymphedema diagnosis and physician prescription specifying garment type, quantity, and measurements

20% Coinsurance

Beneficiaries pay the Part B deductible plus 20% coinsurance, Medicare covers the remaining 80%

CURRENT CHALLENGES

Pumps Still Excluded

The LTA covers garments and supplies only; pneumatic compression devices remain under a separate, unchanged DME benefit

Persistent Equity Gaps

Supply chain delays, inconsistent non-Medicare payer adoption, and socioeconomic disparities continue to limit access despite the new benefit



Intermittent Pneumatic Compression Pumps

HOW THEY'RE USED

Adjunct to CDT

Delivers sequential, graduated pneumatic pressure to help move lymph fluid; typically used alongside compression bandaging or garments, *not as a stand-alone therapy*

30–60 Min, 1–2x/Day

Typical prescribed home use session duration and frequency, tailored by a lymphedema therapist to the patient's stage and tolerance

EFFICACY

64% Lower Incidence

Reduced risk of developing BCRL after breast cancer surgery with IPC use, across 14 RCTs and 1,397 patients

Benefit Fades Without Use

Adding IPC to CDT reduced limb volume within 4 weeks, but the added benefit weakened by about 9 weeks after stopping

INSURANCE REIMBURSEMENT

Covered as DME

Medicare covers pumps as durable medical equipment when medically necessary

61% Improper Payment Rate

Share of 2024 Medicare claims for pneumatic compression devices flagged as improperly paid, reflecting strict medical necessity documentation requirements



Lymphedema Precautions

THE EVIDENCE

Blood draws & procedures

Using the unaffected arm is advised when possible — but isolated use of the at-risk arm has frequently not been shown to increase lymphedema risk, even in patients with ALND.

Air travel

There is no established link between air travel and lymphedema, nor evidence that compression garments confer benefit to at-risk women during flights.

Extreme temperatures

There is a paucity of data supporting the avoidance of sudden or prolonged limb exposure to extreme temperatures (e.g., saunas).



**Position Statement of the
National Lymphedema Network**
NLN Medical Advisory Committee March 2026

Evidence-Based Practices for Lymphedema Risk Reduction

Lymphedema is a chronic and progressive condition where the load of the lymphatic system exceeds its transport capacity, leading to accumulation of lymphatic fluid and edema in the area at risk. Lymphedema can progress through stages of increasing severity, which are characterized by progressive swelling, fat deposition, and tissue changes.¹ It should be noted that research into lymphedema risk factors has been conducted primarily in breast cancer-related lymphedema (BCRL). This position statement reflects recommendations surrounding BCRL, unless otherwise noted. The strongest risk factor for BCRL is axillary lymph node dissection.² Other risk factors include regional nodal irradiation,³ elevated body mass index,^{4,5} low volume swelling,⁶ and Black race or Hispanic ethnicity.^{12,13} Other postulated risk factors include anatomic predisposition, cording (axillary web syndrome), taxane-based chemotherapy and targeted therapies.^{13,14}

Lymphedema risk reduction education is a central component of patient-centered care that extends beyond physiological management to encompass the psychosocial well-being and overall quality of life of those affected or at risk. The emotional, social, and functional impacts of lymphedema can profoundly influence a person's self-image, independence, and daily activities.^{15,16} Recognizing these psychosocial dimensions underscores the importance of individualized education, empowerment, and shared decision-making between patients and healthcare professionals.²¹ This position paper aims to support evidence-informed practices that not only minimize physical risk but also enhance confidence, resilience, and long-term self-management.

The National Lymphedema Network (NLN) published its Position Statement on lymphedema risk reduction practices in 2012,²² with the main aim of providing information to individuals with or at risk of lymphedema, to drive the best possible and most informed choices about risk reduction practices. Since their inception, the NLN guidelines have been the principal driver of patient education for those

at risk for or with lymphedema. However, contemporary evidence necessitates their revision to ensure alignment with current data and evidence-based standards of care. **A comprehensive review of the evidence base for these recommendations will be available in the peer-reviewed companion manuscript: National Lymphedema Network Position Statement: Evidence-Based Practices for Lymphedema Risk Reduction.***

This position statement aims to comprehensively update the NLN risk reduction guidelines through summarizing the evidence base to inform the highest standard of care.

This position statement outlines recommendations for those individuals **at risk** for lymphedema separately from recommendations for individuals with a **confirmed diagnosis** of lymphedema. Individuals at risk of lymphedema are those who have not experienced signs or symptoms of lymphedema but have a known injury to their lymphatic system such as having undergone lymph node removal during cancer surgery. It should be reiterated that evidence is primarily available for breast cancer-related lymphedema; evidence for lymphedema of other etiologies is integrated into this document wherever available.

Finally, every individual who is at risk for, or with, lymphedema should ideally be evaluated and managed by a certified lymphedema therapist or other healthcare professional knowledgeable about lymphedema and the individual's unique situation.

Individuals **at risk** for lymphedema should consider the following actions and precautions:

Prospective Lymphedema Screening

- Individuals at risk for breast cancer-related lymphedema should receive personalized lymphedema risk factor information from healthcare providers knowledgeable about lymphedema as part of a prospective screening program.
- Individuals at risk for breast cancer-related lymphedema should ideally be regularly and



Lifestyle Factors

EXERCISE & STRENGTH TRAINING

87% Lower Risk

Supervised weightlifting reduced risk of long term lymphedema volume increase, across 9 systematic reviews

No Increase

Intense resistance training was not associated with worsened lymphedema symptoms in 115 breast cancer survivors

BODY WEIGHT (BMI)

105%

Higher odds of postoperative BCRL in patients with BMI ≥ 25

38% vs 23%

Lymphedema incidence within 18 months of surgery in patients with preoperative BMI ≥ 25

ADHERENCE TO SELF-MANAGEMENT

39%

Of lymphedema patients wore compression garments continuously as recommended (>12 hrs/day)

28%–69%

Reported range of adherence rates to lymphedema self-management among breast cancer survivors, consistently below optimal levels across studies



Lymphedema Prevention: Early Detection

THE PREVENT TRIAL

7.9%

vs

19.2%

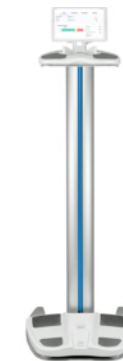
Bioimpedance (L-Dex)

Tape measurement

Progression to needing complete decongestive therapy, assessed over 3 years of follow-up.

Intervention: When either method flagged early fluid accumulation, patients received a 4-week, 12 hour/day compression sleeve and gauntlet before being reassessed regardless of which detection method triggered it.

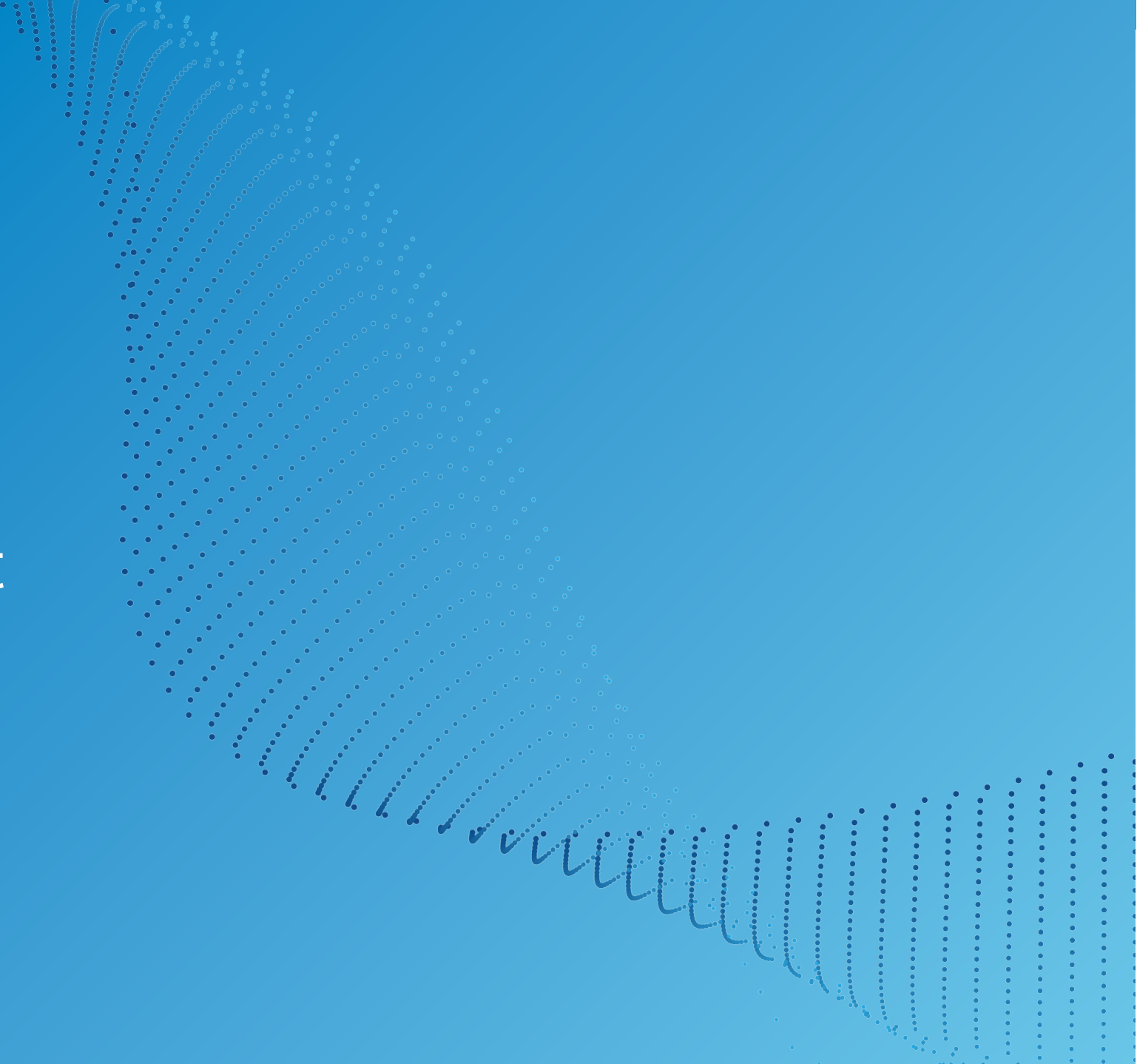
PROSPECTIVE SURVEILLANCE SCHEDULE



SOZO



Surgical Management



Surgery For Lymphedema

Non-surgical treatments

Complete decongestive therapy

Manual lymph drainage

Compression therapy

Exercise

Skin care

Compression garments

Advanced pneumatic
compression therapy

Laser therapy

Surgical treatments

Reductive techniques

Direct excision

Liposuction

Physiological techniques

Lymphatico-lymphatic by-pass

Lymphatico-venous by-pass

Lymph node transfer

Which Surgery Should I Get?

Surgical treatments

Reductive techniques

Direct excision

Liposuction

Physiological techniques

Lymphatico-lymphatic by-pass

Lymphatico-venous by-pass

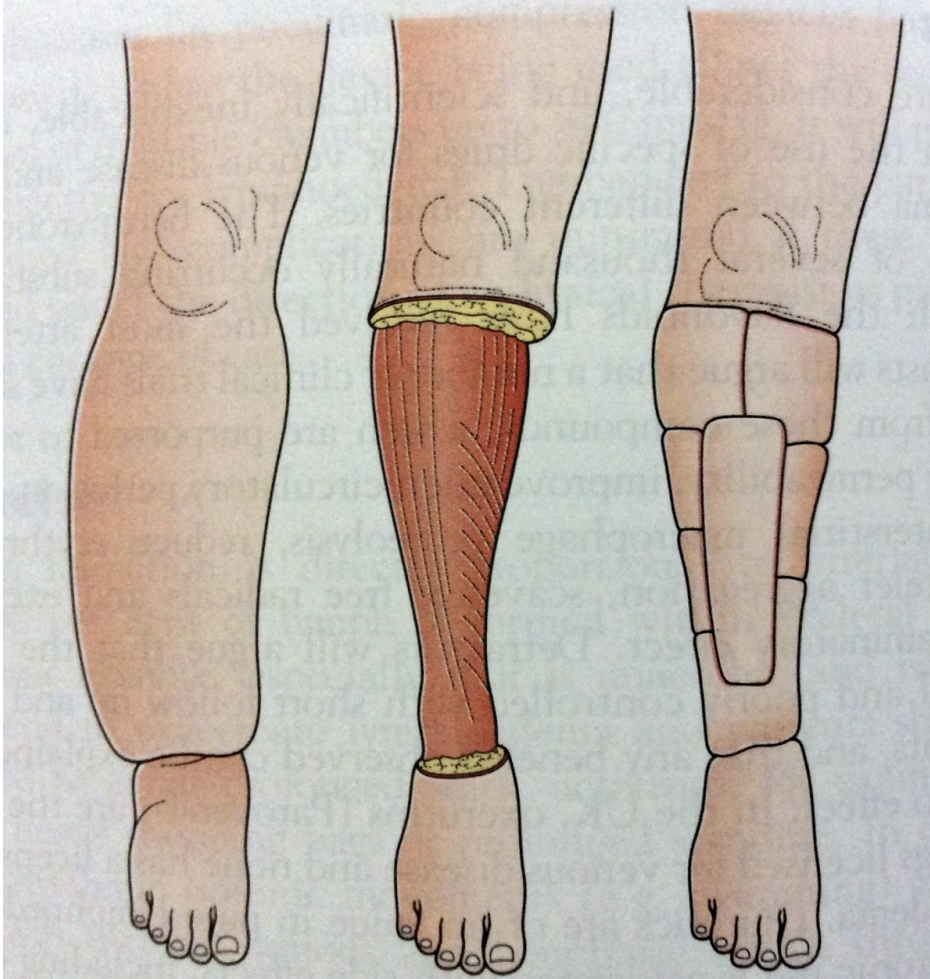
Lymph node transfer

- **Thickened and infected skin**
- **Swelling is mostly due to fat instead of fluid**
- **Usually seen in late stages of Lymphedema**

- **Softer non-infected skin**
- **Swelling is mostly due to fluid instead of fat**
- **Usually seen in earlier stages of Lymphedema**



Direct Excision



Excess tissue removed but morbid aesthetics; residual distal foot/hand lymphedema

Liposuction

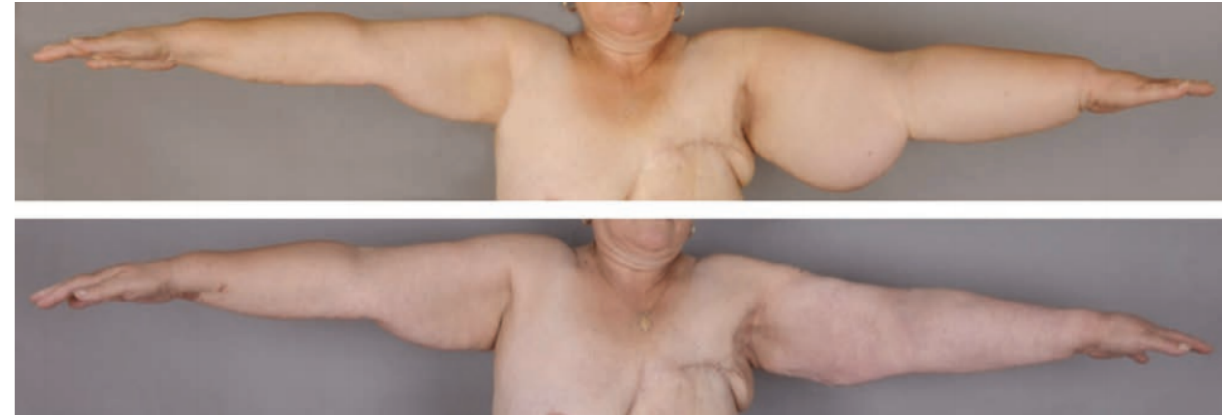
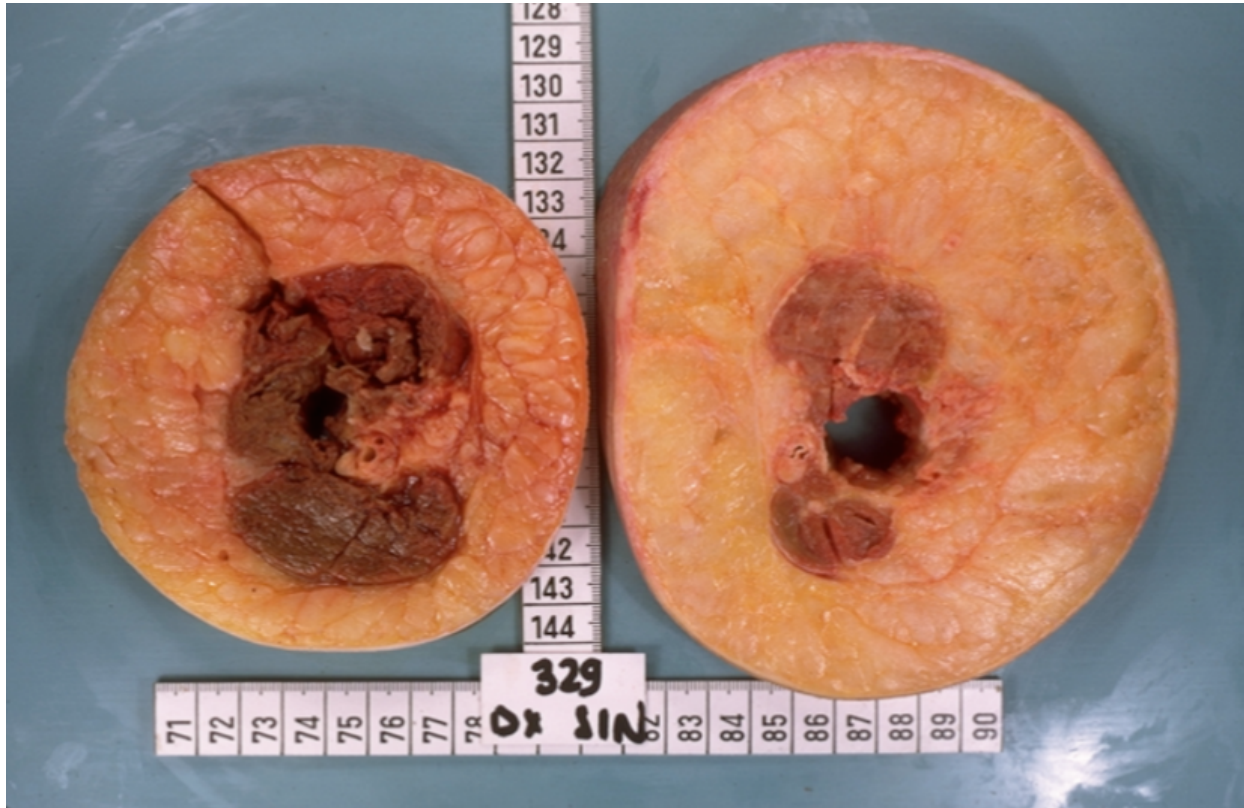
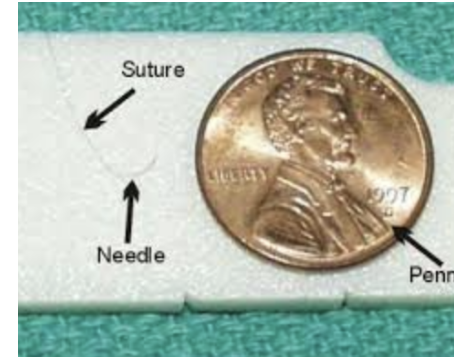
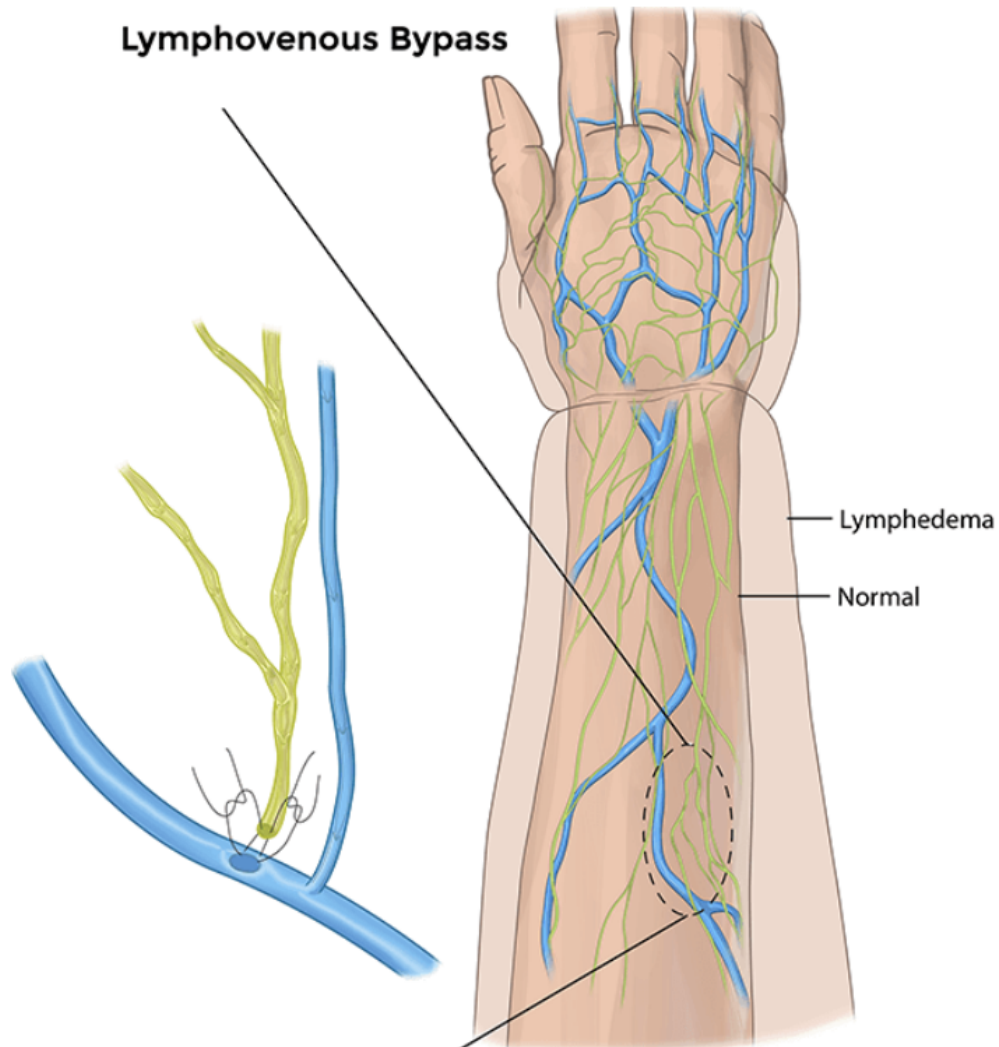


Fig. 8. A, A 57-year-old woman with an excess volume of 4,325 ml that had existed for 5 years. B, Complete reduction at 1 year after liposuction.



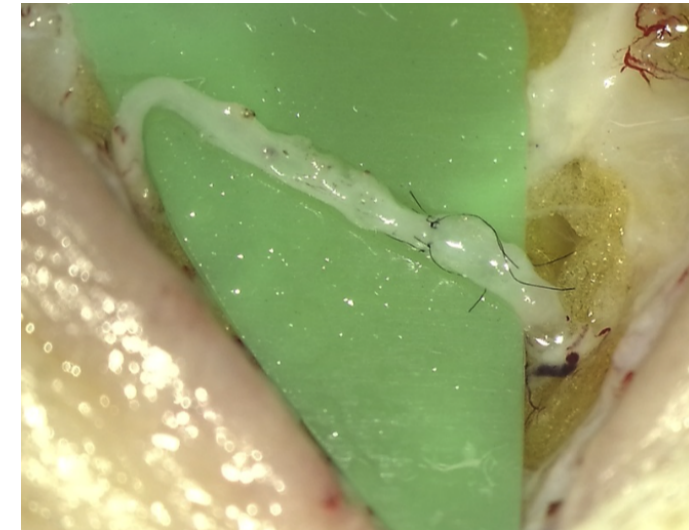
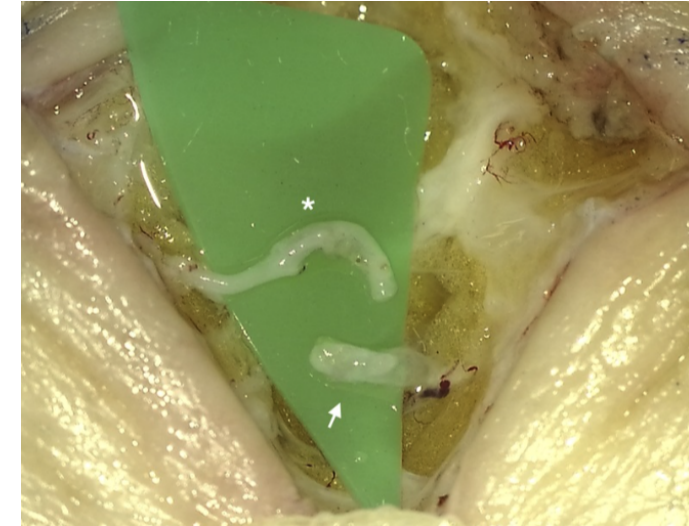
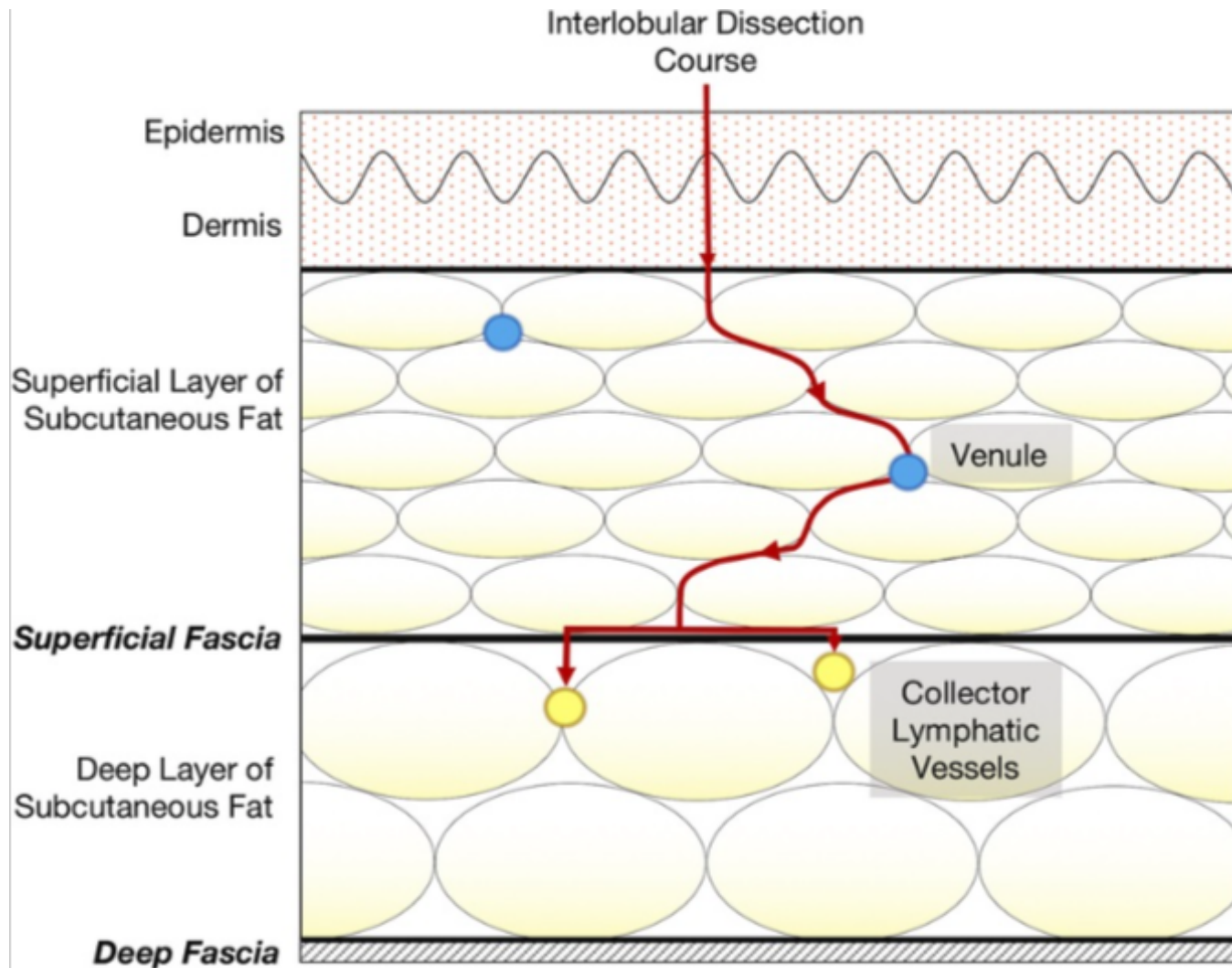
Fig. 9. A, A 77-year-old woman with an excess volume of 2,480 ml that had lasted for 9 years. B, Complete reduction at 5 years after liposuction.

Lymphatico-Venous Bypass (LVB)

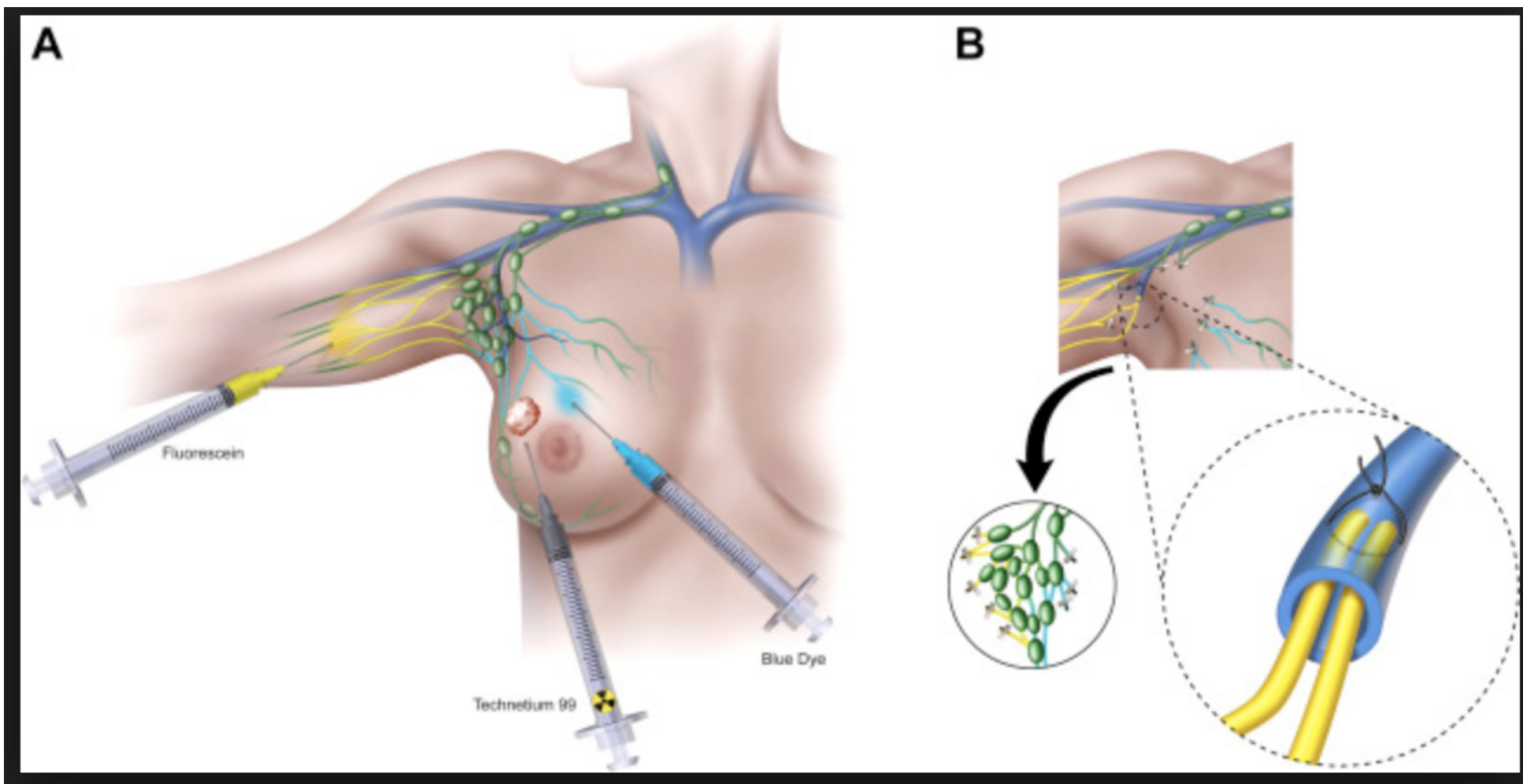


- Super-microsurgical procedure
- < 1mm anastomoses
- 2-4 hour OR time
- Several small incisions
- 23 hr O/N in hospital

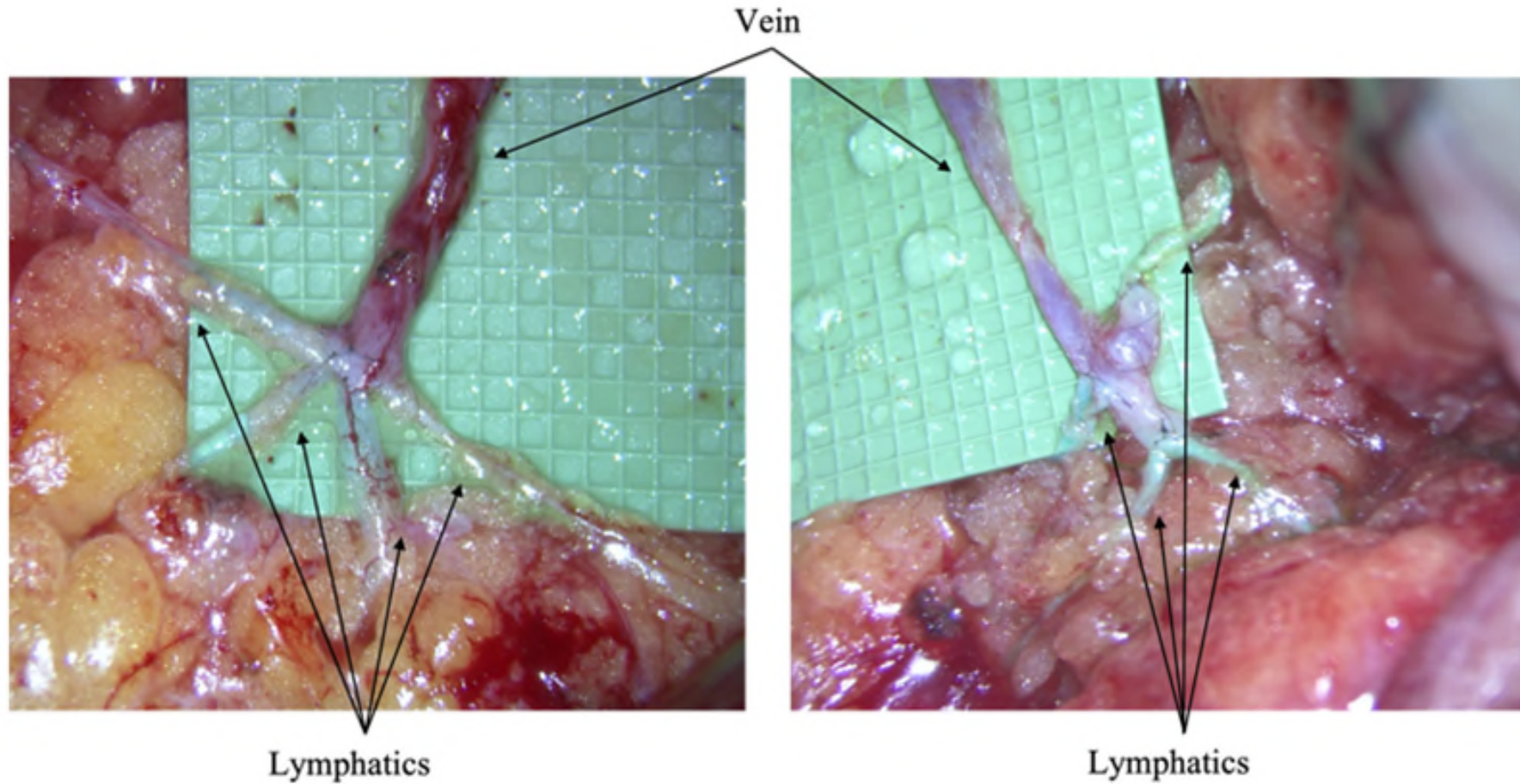
Lymphatico-Venous Bypass (LVB)



Immediate Lymphatico-Venous Bypass

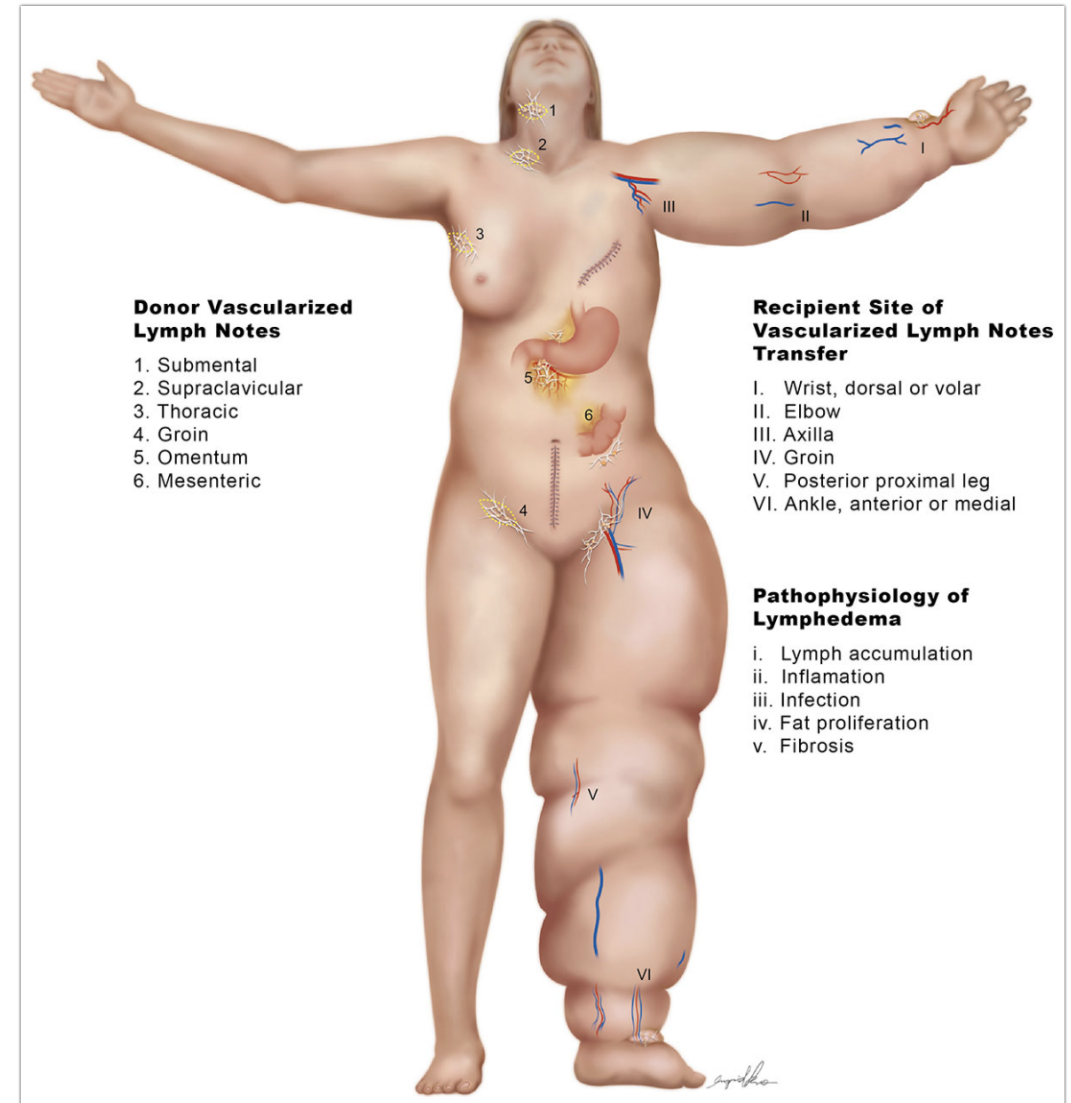


Immediate Lymphatico-Venous Bypass



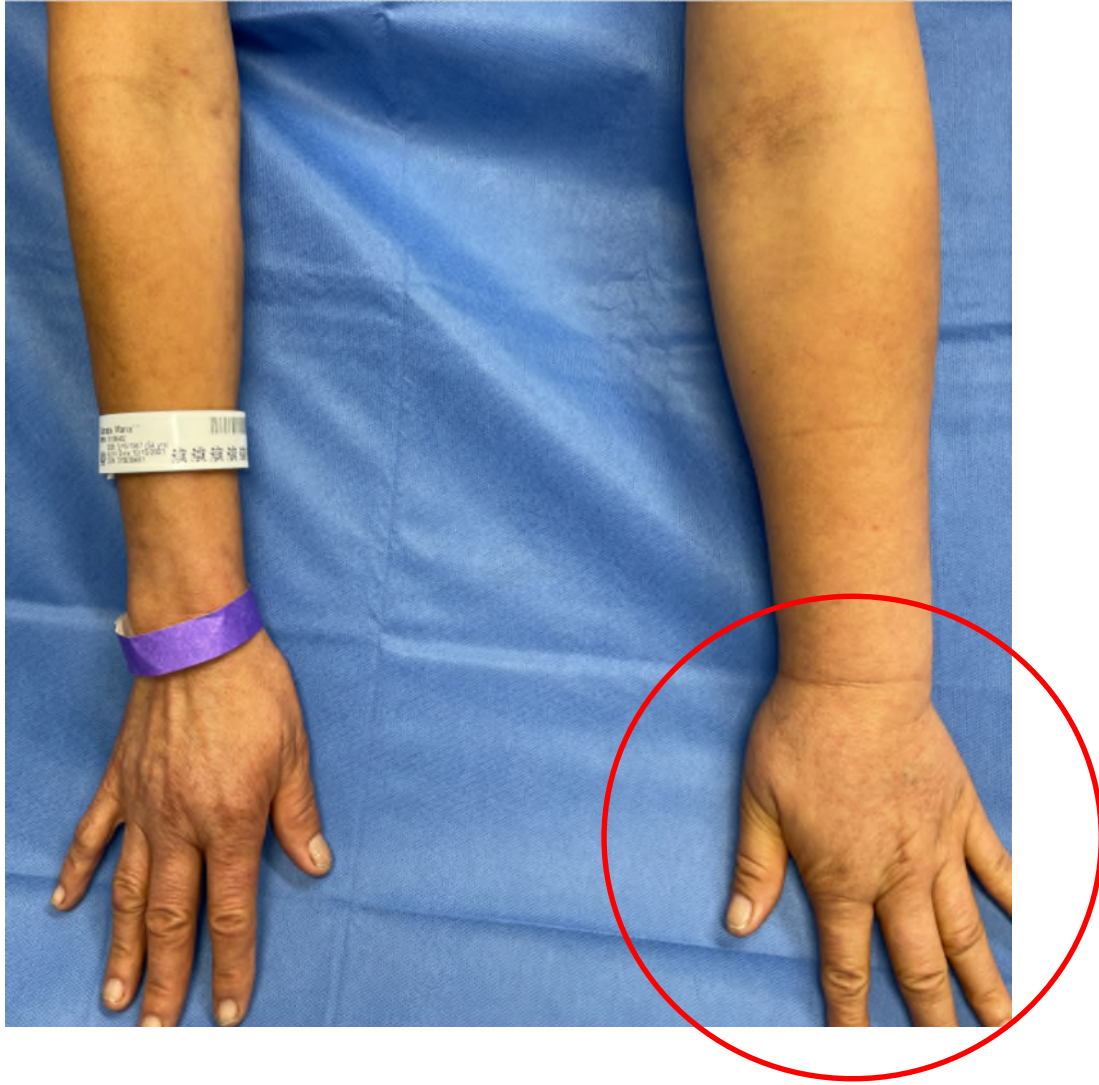
Lymph Node Transfer

- Involves transplanting nodes to affected extremity
- Better outcomes than LVB for later lymphedema stages
- Higher complications
- Longer OR time
- Longer recovery



Data source: Modified figure. Principles and Practice of Lymphedema Surgery. Cheng MH, Chang DW, Patel KM (Editors). Elsevier Inc, Oxford, United Kingdom. ISBN: 978-0-323-29897-1. July 2015, page 219.

Lymph Node Transfer



Pre-op



Post-op

Summary

- Lymphedema is a significant disease with no cure
- Treatment of lymphedema involves CDT +/- surgery
- Surgical modalities:
 - Reductive – Direct excision and Liposuction
 - Physiologic – Bypasses and Lymphatic Transfers
 - Preventative – Immediate Lymphatic Repair at time of Axillary Dissection
- Immediate lymphatic repair seems promising and has the potential for reducing incidence of lymphedema (or possibly preventing lymphedema) in the correct patient population



Thank You

cityofhope.org

