PREPARING FOR SURGERY

KAREN L. HERBST, PHD, MD
UNIVERSITY OF ARIZONA, TUCSON, ARIZONA
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OUTLINE

- Surgery in general
- Liposuction or bariatric surgery
DD AND LIPEDEMA: WHY WORRY ABOUT SURGERY?

- Excess fluid in the tissues (definition of lipedema)
- Altered lymphatic system – sluggish, clogged, blocked, leaking
- Hypermobility of the joints – Ehlers Danlos Hypermobility type
- Mast cell disease conferring sensitivity to medications (especially DD)
- Body size and shape – ask about bariatric tables and other support before you agree to surgery
- Difficulty with ambulation
- Painful tissue
SURGICAL RISKS FOR LIPEDEMA AND DD

- IV infusion of fluid during surgery maintains blood pressure lowered by general anesthesia
  - Places a burden on the lymphatic system and the excess fluid can impair healing
  - Ask your surgeon and anesthesiologist about *individualized goal-directed fluid therapy*

- Anesthesia can impair lymphatic pumping

- Larger incisions through the skin and into tissue can damage the lymphatic system

- The cellular repair process (inflammation) may stimulate growth of adipose tissue and leaky vessels

- Hypermobility and unique shape makes positioning during surgery a risk

- Scar formation can inhibit lymphatic flow

- Pain can be difficult to control especially if you have multiple medication sensitivities

- Slow recovery of mobility; muscle atrophy

- Poor ambulation after surgery, vascular inflammation and leakiness increase the risk for a post-surgical clot
CLOTTING AND BLEEDING

- There are a number of anecdotal reports of women bleeding or clotting after liposuction requiring transfusion.

- Blood clotting/bleeding risk is measured prior to surgery to ensure that general clotting factors are normal.

- This workup is not the complete responsibility of the surgeon – if you have concerns or a family history of bleeding, work with your PCP to figure this out well before surgery.

- Basic coagulation workup:
  - Activated prothrombin time (aPTT)
  - Prothrombin time (PT)
  - Thrombin time (TT)
  - Fibrinogen
  - Platelet count

- *Abnormalities prompt additional labs.*
CONDITIONS ASSOCIATED WITH EASY BRUISING BUT NORMAL PT/INR AND PTT

I. Platelet function defects:
- **Hereditary**: most cases of von Willebrand Disease (vWD), Glanzman’s thrombasthenia, Bernard Soulier syndrome, gray platelet syndrome, storage poor defect
- **Acquired**:
  a) Drug induced platelet dysfunction: aspirin, chlodipogrel, some analgesics, antibiotics, other
  b) Severe kidney dysfunction (uremia)
  c) Disorders of hemopoietic system: paraproteinemias, myelodysplasias, myeloproliferative disorders

II. Disorders of vascular or perivascular tissues:
- **Hereditary**: hereditary hemorrhagic telangiectasia, *Ehler Danlos syndrome*, osteogenesis imperfecta, pseudoxanthoma elasticum, Marfan syndrome, lipedema, Dercum’s disease
- **Acquired**: amyloidosis, scurvy, vasculitis: Henoch-Schönlin purpura, urticarial vasculitis, senile purpura, others: steroid induced, hyperglobulinemic, psychogenic purpura; cryoglobulinemia

III. Disorders of blood clotting:
Factor XIII deficiency, most cases of vWD, some of mild factor VIII and factor IX deficiency (depending on the sensitivity of PTT reagent to factor VIII and factor IX)
CLOTTING RISK

- **Inherited hypercoagulable conditions (family history):**
  - Factor V Leiden (the most common)
  - Prothrombin gene mutation
  - Deficiencies of natural proteins that prevent clotting:
    - Antithrombin
    - Protein C
    - Protein S
  - **Elevated levels of homocysteine (irritated blood vessels, atherosclerosis, clot)**
  - Elevated levels of fibrinogen or dysfunctional fibrinogen (dysfibrinogenemia)
# ELEVATED HOMOCYSTEINE

<table>
<thead>
<tr>
<th>Condition</th>
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<tbody>
<tr>
<td>Deficiency of folic acid or vitamins B&lt;sub&gt;6&lt;/sub&gt;/B&lt;sub&gt;12&lt;/sub&gt;</td>
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<tr>
<td>Kidney disease</td>
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<td>Low levels of thyroid hormones (hypothyroidism)</td>
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<td>Medications (methotrexate)</td>
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<td>Methylene tetrahydrofolate reductase (MTHFR) genetic mutations</td>
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<tr>
<td>Psoriasis</td>
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<td>Systemic lupus erythematosus</td>
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<td>Unknown</td>
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Clotting is a big concern!

Homocysteine level is an easy blood test for your doctor to order.

The treatment is easy – B vitamins*.

*B vitamins do not reduce CVD in women; homocysteine may not cause but be a marker of CVD.
GENERAL ANESTHESIA INHIBITS LYMPH FLOW

- Propofol (Diprivan) and sevoflurane significantly decrease the amplitude of spontaneous activity of lymphatic vessels (Anesthesiology. 2004;101:687-94)

- The contractility of the mesenteric lymphatics is suppressed in a dose-dependent manner by halothane (Paediatr Anaesth 2001; 11: 479–82; Lymphology 1988; 21: 128–30)

- Pentobarbitone and halothane inhibited bovine lymphatic contractility (Microvasc Res. 1989;37:70-6)

- Lymph flow was suppressed by general anesthesia most in peripheral regions (skin, tendon, muscular areas) while lymph draining soft tissues in central regions (kidney, liver) was less affected (Lymphology. 1975;8(4):126-35)

Nifedipine and lignocaine reduce lymphatic pumping. (PLoS Negl Trop Dis. 2014;8:e2722)
ANESTHESIA

+ 

↓ Lymphatic flow from the legs
EHLERS DANLOS HYPERMOBILITY TYPE (EDS-HT) AND SURGERY


- Problems with general anesthesia: waking up too quickly or taking too long to wake up.

- Intubation should be performed with care due to TMJ and cervical spine instability and minor mucosal fragility – consider pediatric devices.

- Much more prone to joint dislocations so positioning in surgery is important and improper positioning can cause a lot of damage.

- Soft-tissue fragility and delayed wound healing may be counteracted by doubling the waiting time before suture stitches removal.

- Prophylactic use of desmopressin (DDAVP) may reduce the chance of excessive bleeding.

- Nerve blocks may be a good choice over general anesthesia **(J Clin Anesth. 2016 Mar;29:50-3)**
IMPROVE BEFORE SURGERY

- Sluggish lymphatics
- Fibrous tissue
- Leaky vessels
- Friable tissue
- Inflammation
- Pain
- Mobility
- Self care
- Positive thinking
- Support
OPTIMIZE LIPEDEMA AND DERCUM’S DISEASE BEFORE SURGERY

- Lifestyle – healthy eating and exercise
- Supplements as needed
- Medication as needed
- Complete decongestive therapy - manual lymph drainage, compression, sequential pneumatic compression pumps
- Venous duplex ultrasound to assess for treatable disease
- Compression garments
- Positive thinking
- Support by friends and family
SEE A CERTIFIED LYMPHATIC DRAINAGE THERAPIST *BEFORE SURGERY*

- Identify treatable venous disease
- Fibrosis of the tissue can be mapped; high amounts of fibrosis should be communicated to the surgeon as areas of potentially poor healing and/or difficult liposuction.
- Improve lymphatic flow and decongested tissue to improve healing after surgery
- Compression can be discussed in detail
- Home exercise plans (HEP) that can improve fitness and recovery after surgery
- Skin can be improved
- Complete decongestive therapy improved the outcome of a woman when performed before and after bariatric surgery

Fig. 6. A female with lipo-lymphedema stage II. (A) Before treatment, (B) after completion of conservative management (manual lymphatic drainage plus compression therapy). Cuffing sign is not present after treatment (arrow).

*Omaira et al.; BJMMR, 5(11): 1328-1337, 2015,*
EXERCISE PRIOR TO SURGERY IMPROVES OUTCOMES

- Presurgical physical therapy = “Prehab”
- Preoperative supervised exercise training reduced postoperative cardiac, respiratory, renal complications, and length of hospital stay in patients undergoing elective vascular repair (Ann Surg. 2016 Jan 7. [Epub ahead of print])
- **Prehab** includes complete decongestive therapy for lipedema and DD!
EXERCISE IS GOOD FOR THE LYMPHATIC SYSTEM


- Aerobic exercise training of high-fat diet (HFD)-induced obese mice results improved lymphatic function, independent of weight loss (Hespe et al., 2016).

- These changes correlated with decreased perilymphatic inflammatory cell accumulation and normalization of isolated lymphatic endothelial cell gene expression profile.
NUTRITION

- It’s easier to become comfortable with a sustainable healthy eating plan before rather than after surgery.

- Reducing inflammation with food helps you heal!
  - Rainbow colored fruits and vegetables
  - Omega-3-fatty acids
  - Fiber

Lymphedema and Lipedema Nutrition Guide
by Chuck Ehrlich, Emily Iker, MD, Karen Herbst, MD, Linda-Anne Kahn, CLT-LANA, Dorothy D. Sears, PhD, Mandy Kenyon, RD, and Elizabeth McMahon, PhD, Lymph Notes 2015.
ITEMS FOR THE LETTER OF MEDICAL NECESSITY FOR SURGERY

1. What is the natural history of the lipedema or DD – has it worsened over time
2. What are the current problems caused by lipedema or DD
3. Family history of similar problems and their outcomes
4. A list of everything you have tried and used with success or that failed
   I. Complete decongestive therapy
   II. Compression garments
   III. Sequential pneumatic compression pump
   IV. The number of “diets” that failed to reduce the affected fat
   V. Exercise - type and how long/years?
   VI. Supplements and medications
5. Biopsies/tissue samples – did they identify fibrotic tissue, perivascular cells indicative of vascular damage
6. Abnormal imaging - lymphangioskintigraphy, documented excess SAT on CT or MRI
TO IMAGE OR NOT TO IMAGE

▪ Imaging of the lymphatic system by lymphangioscintigraphy (LAS) should be performed for diagnostic or treatment-related purposes

▪ A normal exam may not be of benefit in getting insurance coverage for liposuction but it can rule out issues such as lymphedema

▪ Get a lymphedema/lipedema/DD expert to review the LAS images
  ▪ Delays in lymphatic transit may still be described as normal exams in the “IMPRESSION” by the radiologist and this is what the insurance company will read.
▪ Helps you perform your daily tasks after the surgery
▪ They will follow a list of specific things you need, like cooking, laundry, bill paying, or company during surgery or follow up doctor appointments
▪ Can sense that something is going in the wrong direction and changes the trajectory
▪ Encourages you in your journey
▪ Can make you laugh, and knows when that’s appropriate
▪ Will let you cry when you need to
▪ Does not offer advice unless you ask for it
▪ Can cook healthy and tasty food
There is more to people’s experience of recovery than simply tissue repair.

People with higher scores in optimism and coping did better after surgery
*J Orthop Trauma.* 2012;26:370-8

**View your surgical specimen** - Patients who were given their removed disc fragments after surgery had improvements in leg pain, back pain, limb weakness, paraesthesia and reduced analgesic use after discectomy for DDD
*J Neurol Neurosurg Psychiatry.* 2009;80:1044-6

Sleeve gastrectomy
▪ Be aware of your personal risks before any surgery
▪ Discuss the need for a clotting or bleeding workup with your doctor well before any surgery
▪ Explain to your doctor the need to keep incisions small to reduce the risk of cutting lymphatic vessels
▪ Make sure your doctor understands the surgical risks of EDS-HT
▪ Maximize your lymphatics and overall health prior to any surgery
▪ Image your vascular system when necessary
▪ Create an environment that optimizes your thinking before surgery
▪ Assist in writing the letter of medical necessity
▪ View your specimen!
Thank You!