



Lipedema & Lipedema Surgery

Karol Gutowski, MD, FACS

Private Practice

University of Chicago

University of Illinois

IOS

ILLINOIS OBESITY
SOCIETY

No Disclosures

Background

University of Wisconsin

Post bariatric body contouring

Unrecognized lipedema patients

Private Practice

Referral center for lipedema



A surgeon in blue scrubs and yellow gloves is performing a procedure on a patient's abdomen. The surgeon is holding a long, thin instrument in their right hand. The patient's abdomen is visible, showing some discoloration and a surgical scar. The background is a plain, light-colored wall.

Objectives

Lipedema presentation
Nonsurgical treatments
Liposuction for lipedema
Skin & tissue excision

Mayo Clinic 1951: Lipedema First Report in 1910

Annals of Internal Medicine®

Article | 1 May 1951

LIPEDEMA OF THE LEGS: A SYNDROME CHARACTERIZED BY FAT LEGS AND EDEMA

LESTER E. WOLD, M.D., EDGAR A. HINES JR., M.D., F.A.C.P., EDGAR V. ALLEN, M.D., F.A.C.P.

[Author, Article, and Disclosure Information](#)

<https://doi.org/10.7326/0003-4819-34-5-1243>

There is little in the literature on abnormal localized depositions of body fat to clarify the syndrome of lipedema of the legs which two of us (E. V. A. and E. A. H.) described in 1940.¹ Confusion and uncertainty, both manifested in an extensive article by Lyon² in 1910, are demonstrated by the use of such terms as "oedeme hystérique" and "pseudo-edema." We are not concerned in this presentation with the type of lipodystrophy (lipodystrophia progressiva) which is generally felt to be characterized by loss of subcutaneous fat of the upper half of the body and increased deposition of fat...

ARCHIVES OF INTERNAL MEDICINE

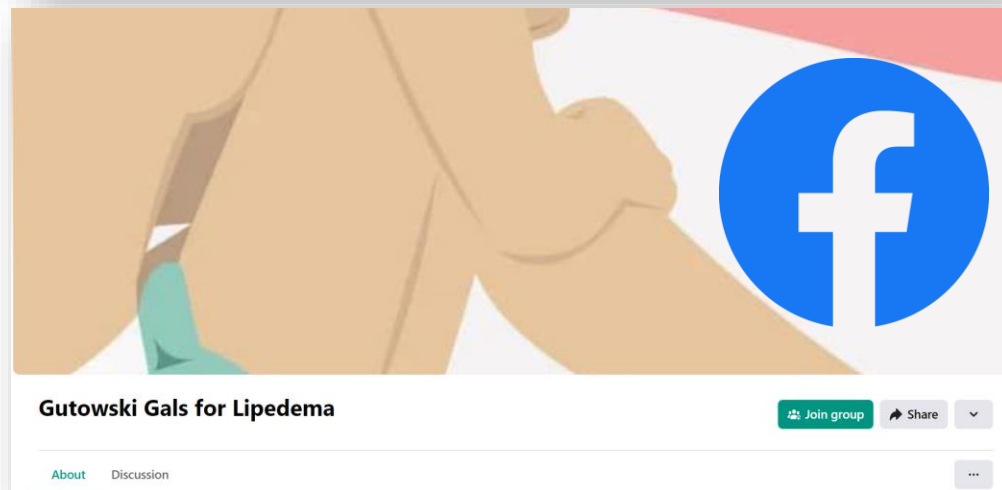
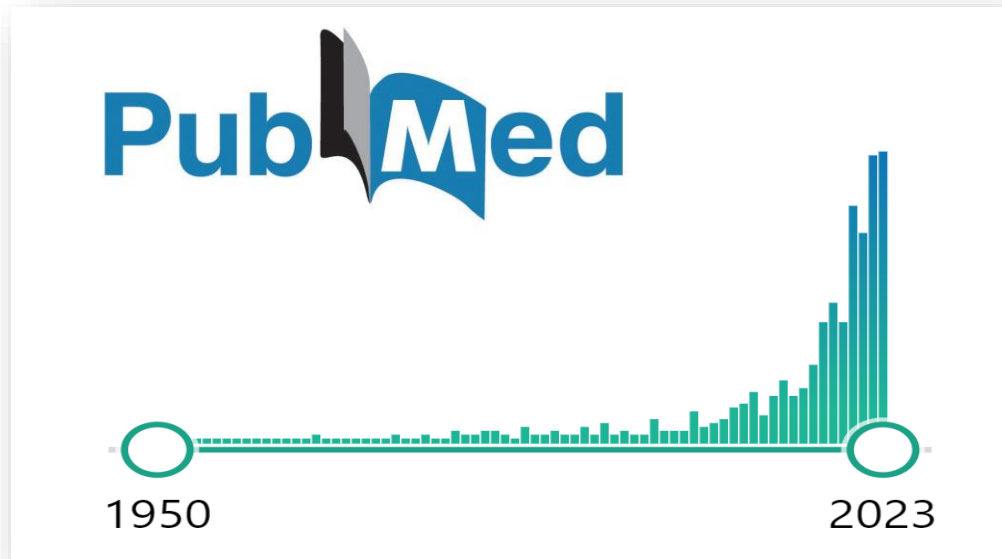
July 1910

ADIPOSIS AND LIPOMATOSIS CONSIDERED IN REFERENCE TO THEIR CONSTITUTIONAL RELATIONS AND SYMPTOMATOLOGY

IRVING PHILLIPS LYON, M.D.

Synopsis Introduction. Personal observations (20 cases, 19 photographs). Consideration of special clinical varieties or syndromes—groups of cases. Group I. Adiposis dolorosa. Group II. Obesity. Group III. Nodular circumscribed lipomatosis. Group IV. Diffuse symmetrical lipomatosis (*Fetthals*, Madelung; *adéno-lipomatose symétrique à prédominance cervicale*, Launois and Bensaude). Group V. Neuropathic edema, pseudoedema, pseudolipoma and lipoma. Group VI. Adipositas cerebialis (Fröhlich, Madelung and others). Consideration of the combined groups. General summary (including special subjects, arthritism, heredity, etc.). Etiology (including glands of internal secretion). Treatment. Conclusions. Bibliography.

Lipedema Awareness



The poster for FDRS 2024 features a night-time photograph of the St. Louis skyline, with the Gateway Arch prominently in the center. The text 'Save the Date' is written in large white letters at the top. Below it, 'FDRS 2024' is written in bold white letters, followed by the dates 'April 19-21, 2024'. A circular inset on the right shows a group of people at a conference. At the bottom right, the location 'Marriott St. Louis Airport' and the price '\$129/night' are listed, along with the URL <http://bit.ly/FDRS2024-hotel>. The logo for the 'FAT DISORDERS RESOURCE SOCIETY' is at the bottom left.

Lipedema Awareness in Medical Community

“You’re fat”

“You need to lose weight”

“Never heard of it”

- Misdiagnosed & mistreated as lymphedema
- No ICD-10 code in USA
 - Use R60.9: Edema, unspecified
- More awareness among
 - Physical therapists
 - Vein specialists



Lipedema Presentation

- Common but often unrecognized fat overgrowth disorder affecting women
- Mischaracterized as simple obesity
- Onset
 - Teens – legs out of proportion
 - After hormonal events
 - Menopause
- +/- Obesity
- +/- Lymphedema



Lipedema Findings

- Disproportionate fibrotic subcutaneous adipose connective tissue in limbs
- Symmetric enlargement legs & arms
- Hypersensitivity (tenderness) & pain
- Easy bruising
- Leg or arm heaviness or tightness
- Subcutaneous nodules
- Unresponsive to diet, exercise, surgery
- Prevalence: 5-10% of females?
- Inherited ~60%



CRITERIA FOR LIPeDEMA DIAGNOSIS

	ALLEN & HINES	WOLD et al	BUCK & HERBST	S1 GUIDELINES [German] Reich-Schupke et al 2017	FIRST DUTCH GUIDELINES Halk & Damstra	UK BEST PRACTICE GUIDELINES Wounds UK	SPANISH CONSENSUS DOCUMENT Alcolea et al	JWC INTERNATIONAL CONSENSUS DOCUMENT Bertsch et al 2020	US STANDARD OF CARE Herbst et al	KEY AGREEMENTS AND DIFFERENCES
	1940	1951	2016	2017	2017	2017	2018	2020	2021	
NAME	LIPeDEMA	LIPeDEMA	LIPeDEMA	LIPeDEMA	LIPeDEMA	LIPOEDEMA	LIPeDEMA	LIPOEDEMA	LIPeDEMA	
ONSET	patient reports GIRLHOOD	NONE DETERMINED	BY the 3rd DECADE of LIFE	HORMONAL CHANGE puberty, pregnancy, menopause	PUBERTY	PUBERTY OR HORMONAL CHANGE	PUBERTY		HORMONE, WEIGHT AND/OR SHAPE CHANGE	Bertsch disagrees with the "dogma" of onset
POPULATION AFFECTED	FEMALE	FEMALE	FEMALE	FEMALE	FEMALE	FEMALE	FEMALE	FEMALE	FEMALE	
SYMPTOMS REQUIRED										
Family history	✓	✓		✓		✓	✓	✓	✓	No meaningful difference. Authors of guidelines that are silent on family history often cite importance of genetics in other papers
Bilateral and symmetrical subcutaneous tissue enlargement of limbs	✓	✓	✓	✓	BILATERAL	✓	✓		✓	No meaningful difference. Although absent in the JWC, other papers by same authors discuss this feature.
Disproportionate fat distribution (upper & lower halves of body)		✓	✓	✓	✓	✓	✓	✓	✓	Difference of opinion between whether disproportion is between upper/lower aspects of body, or trunk/limb
Upper Body: Arms affected, sparing hands			30% prevalence ✓	✓	OR ✓	✓	NOT RECOGNIZED: Lipodystrophies or obesity	References that lipedema can be in the arms and legs	30% prevalence of fat tissue in hands ✓	Universal consensus of lipedema occurring in the legs. Arms have general consensus, excluding Spanish who see it as a lipodystrophy or obesity comorbidity
Lower Body: Legs affected, sparing feet	✓	✓	✓	✓	✓	✓	✓		✓	German S1 and JWC attribute weight loss to loss of comorbid obesity only
None or limited weight loss in affected tissues	✓	✓	✓		✓	✓	✓		✓	Degree of cuffing can be described as slender instep or braceleting
Cuffing or ring fold at the ankle or wrist: Separation between normal and abnormal tissue at the ankle, elbow, or wrist			✓	✓	✓	✓	✓		✓	
Distal fat tendrils of the knee (popliteus)					Optional criteria IF missing 2 red check-boxes OR					
Pain or tenderness to touch or palpitation	USUALLY PRESENT	USUALLY PRESENT	✓	✓	✓	✓	✓	✓	Not Always ✓	The presence of pain is noted in ALL guidelines. Whether it is required to distinguish between differential diagnoses (specifically lipohypertrophy) is under debate.
Fatigue in extremities					✓					
No reduction of volume and/or pain when raising/elevating extremities	✓	✓	✓		✓	✓			✓	
Tendency for easy bruising			✓	✓	✓	✓	✓		Or vascular fragility ✓	General agreement; although several documents note that this is difficult measure and rely on patient reports
Negative Stemmer's Sign			✓	✓	Noted in 2014	✓	✓			General agreement; used as a differential diagnostic tool - not as a feature of lipedema
Edema (pitting or nonpitting)	Minimal	Minimal	Minimal	✓	MILD edema often accompanies lipedema	Absent or minor in early stages		NO Oedema in lipedema	✓	General agreement on mild or minimal edema, but disagreement about whether it is a feature of "pure" lipedema or a comorbidity with progression
Presence of Telangiectasia			✓				NOT unique to lipedema as 50% of women have CL of CEAP classification			Most see it as a comorbidity
Altered skin appearance or temperature	SOFT & PLIABLE	SOFT & PLIABLE	SOFT COLD			✓	✓			
Altered subcutaneous tissue texture: thickening, nodules			GRANULAR to NODULAR		THICKENED	ALTERED	SOFTER		NODULES ✓	Largely in agreement that textural changes are important, but mainly for differential diagnosis. The US SOC advocates including it in diagnosis
Heavy feeling in legs or extremities				✓	✓		✓	Noted as a symptom of pain		
Psychological involvement	Potential Comorbidity	Potential Comorbidity	Potential Comorbidity	Potential Comorbidity		Potential Comorbidity	✓	✓	Potential Comorbidity	Psychological involvement is noted in ALL of the consensus documents. Key difference - part of clinical criteria OR effect of living with chronic condition
Abnormal gait and limited mobility (flat feet, genu valgum)					Noted in 2014	✓	Comorbidity		Comorbidity	
Hypermobility						Association Noted	Comorbidity		Comorbidity	Only US SOC advocates using Beighton criteria in diagnosis criteria; others see as comorbidity or are silent
Muscle weakness						✓	Comorbidity		Comorbidity	
Decrease in skin elasticity							Comorbidity		Comorbidity	

Lipedema vs Lymphedema

Characteristic	Lipoedema	Lymphoedema
Sex	Women only	Both sexes
Obesity	Present	Present or absent
Region involved	Always both limbs	Usually one limb
Pain on pressure	Usually present	Usually absent
Progression	All parts of limb are involved simultaneously	From distal to proximal portion of limb
History of cellulitis	Absent	Occasionally present
Nature of swelling	Usually soft	Usually firm
Pitting oedema	Usually minimal	Usually marked
Effect of elevation	Persistent enlargement	Reduction to normal size in early stages
Family history	Frequently obtained	Almost always not obtained



Lipedema



Lymphedema



Stage 1



Stage 2

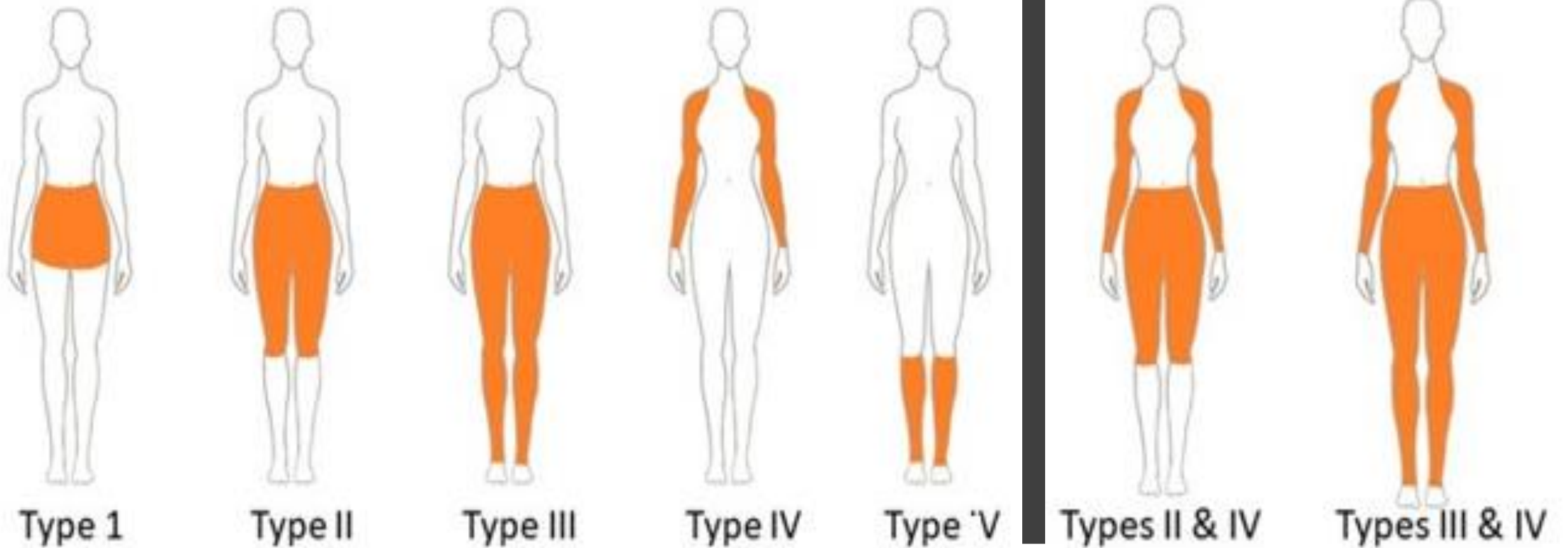


Stage 3



Stage 4

Lipedema Stages

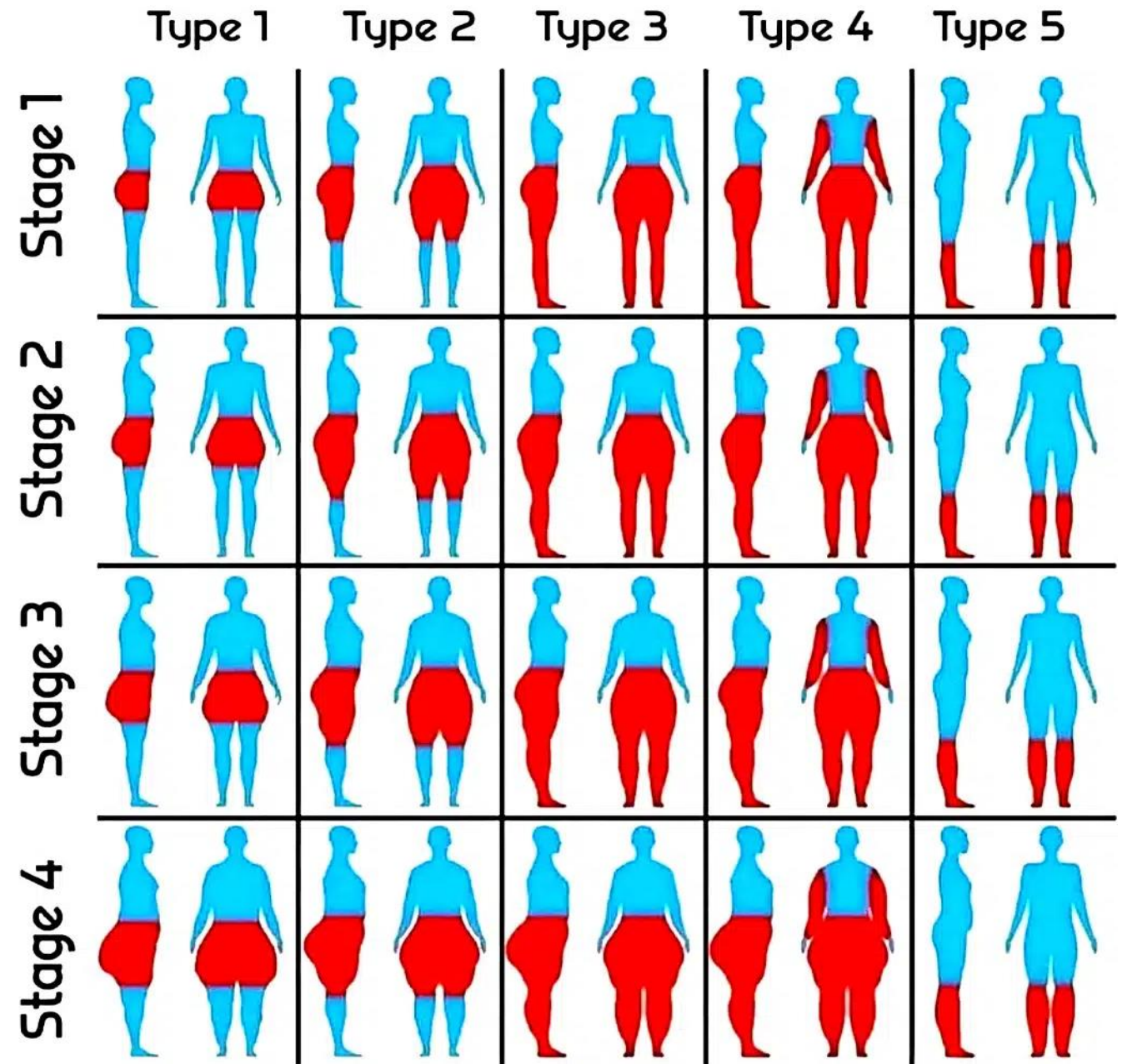


Lipedema site locations

Common
Combinations

Lipedema Types

Broad Range of Lipedema Presentations



Lipedema Imaging

Not needed unless lymphedema treatment considered



Lymphoscintigraphy



Indocyanine Green Lymphography

Lipedema After Bariatric Surgery

- Stage 2 or 3 lipedema diagnosed in patients after bariatric surgery
- 2-year average weight loss: 73% of excess weight
- Average BMI decreased 50 to 32
- Average lipedema pain score did not change (7.3 to 7.9)

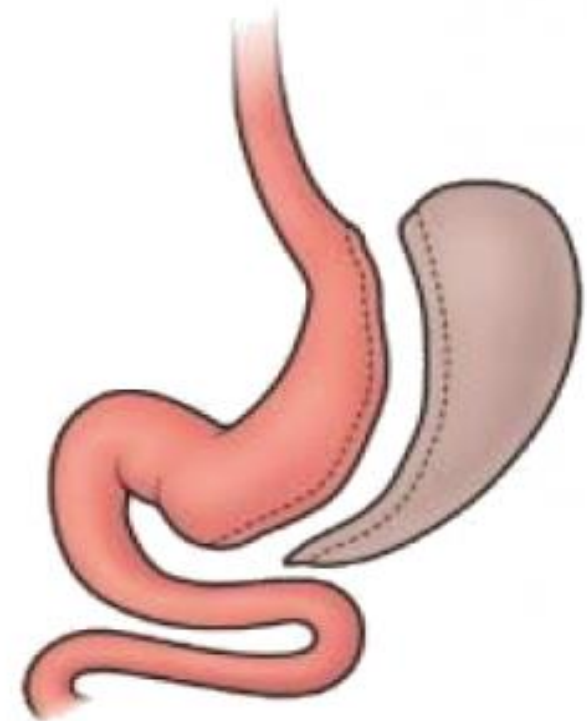
Persistent lipedema pain in patients after bariatric surgery: a case series of 13 patients

Manuel E Cornely¹, Till Hasenberg², Oliver A Cornely³, Christian Ure⁴, Christian Hettenhausen⁵, Jeremias Schmidt⁶

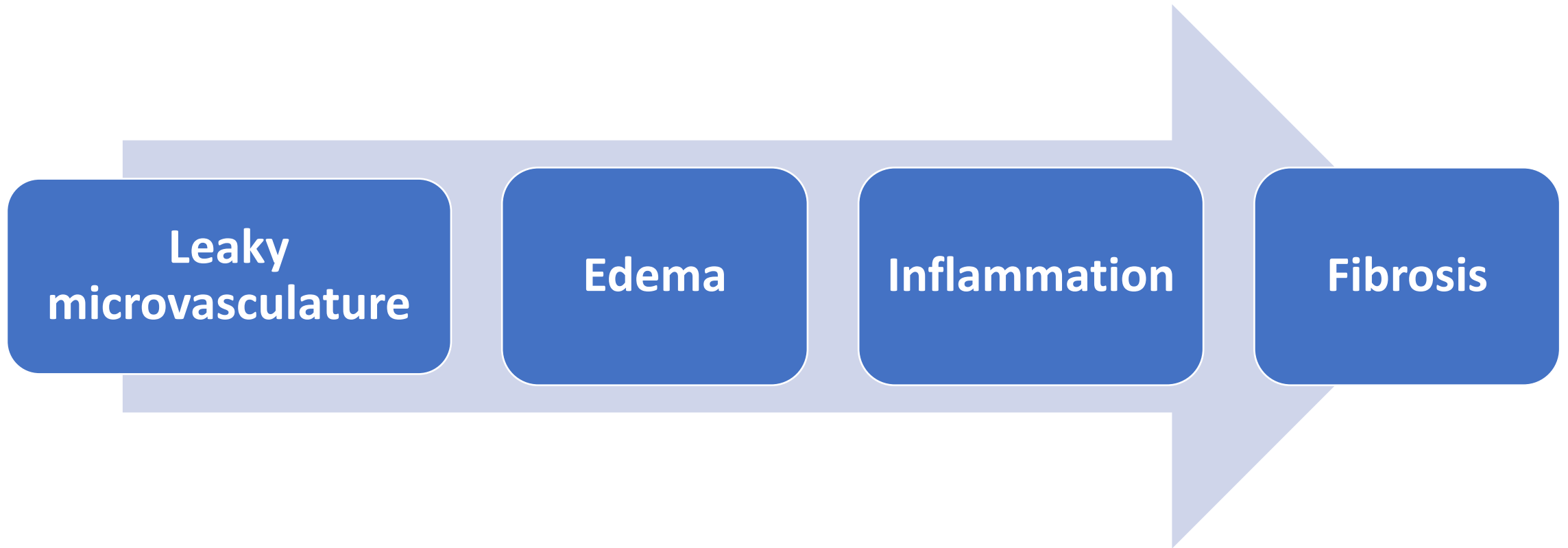
Roux-en-Y Gastric
Bypass (RYBG)



Vertical Sleeve
Gastrectomy (VSG)



Advanced Lipedema to Fibrosis Theory



Lipedema Treatment Options (Not Cures)

Medications &
supplements

Diet & nutrition

Physical therapies
& modalities

Liposuction

Liposuction +
tissue excision

Role of Glucagon-
like peptide-1
(GLP-1)
antagonists?

Lipedema Medications & Supplements

Human studies needed to confirm effectiveness in lipedema & to select most effective dietary supplements

REVIEW

Dietary supplements for lipedema

GABRIELE BONETTI^{1,*}, KAREN L. HERBST², KRISTJANA DHULI¹, AYSHA KARIM KIANI³, SERENA MICHELINI⁴, SILVIA MICHELINI⁵, MARIA RACHELE CECCARINI⁶, SANDRO MICHELINI⁷, MAURIZIO RICCI⁸, MARINA CESTARI^{9,10}, MICHELA CODINI⁶, TOMMASO BECCARI⁶, FRANCESCO BELLINATO¹¹, PAOLO GISONDI¹¹, MATTEO BERTELLI^{1,3,12}
¹ MAGI'S LAB, Rovereto (TN), Italy; ² Total Lipedema Care, Beverly Hills California and Tucson Arizona, USA; ³ MAGI EUREGIO, Bolzano, Italy; ⁴ Unit of Physical Medicine, Sapienza University of Rome, Rome, Italy; ⁵ Neurosurgery, University of Tor Vergata, Rome, Italy; ⁶ Department of Pharmaceutical Sciences, University of Perugia, Perugia; ⁷ Vascular Diagnostics and Rehabilitation Service, Marino Hospital, ASL Roma 6, Marino, Italy; ⁸ Division of Rehabilitation Medicine, Azienda Ospedaliero-Universitaria, Ospedali Riuniti di Ancona, Italy; ⁹ Study Centre Pianeta Linfedema, Terni, Italy; ¹⁰ Lymphology Sector of the Rehabilitation Service, USL Umbria 2, Terni, Italy; ¹¹ Section of Dermatology and Venereology, Department of Medicine, University of Verona, Verona, Italy; ¹² MAGISNAT, Peachtree Corners (GA), USA

Molecule	Source	Mechanism of action
Chitosan	Crustaceans	Reduces fat absorption
L-Carnitine	Chemical catalyst that is synthesized by human kidneys, brain, and liver	Participates in fatty acid transport into mitochondria during the breakdown of fats
Chromium	Trace mineral found in meat, grain, nuts	Reduces insulin resistance
Ephedrine	The plant <i>Ephedra sinica</i>	Stimulates sympathetic neuronal action
Synephrine	Citrus fruits	Stimulates thermogenesis
Pyruvate	Intermediate of glycolysis	Reduces appetite and fatigue, increases energy levels and muscle glycogen stores
Conjugated Linoleic Acid	Meat & dairy products	Transports dietary fats to cells for lipolysis

Diet & Lipedema

- LCHF diet more effective than MFMC in body weight, body fat, and lower limb circumferences reduction
- LCHF diet reduced pain & improved QOL

Open Access Full Text Article

ORIGINAL RESEARCH

The Effect of a Low-Carbohydrate, High-Fat Diet versus Moderate-Carbohydrate and Fat Diet on Body Composition in Patients with Lipedema

Małgorzata Jeziorek¹, Andrzej Szuba², Krzysztof Kujawa³, Bożena Regulska-Ilow¹

¹Department of Dietetics, Faculty of Pharmacy, Wrocław Medical University, Wrocław, Poland; ²Department of Angiology, Hypertension & Diabetology, Wrocław Medical University, Wrocław, Poland; ³Statistical Analysis Center, Wrocław Medical University, Wrocław, Poland

ORIGINAL ARTICLE

Obesity Science and Practice WILEY

Effect of a ketogenic diet on pain and quality of life in patients with lipedema: The LIPODIET pilot study

Vilde Sørli¹ | Ann Kristin De Soysa² | Åsne Ask Hyldmo³ | Kjetil Retterstøl¹ | Catia Martins^{3,4} | Siren Nymo^{3,4,5}

Article

The Effect of a Low-Carbohydrate High-Fat Diet on Laboratory Parameters in Women with Lipedema in Comparison to Overweight/Obese Women

Małgorzata Jeziorek¹, Andrzej Szuba², Monika Sowicz², Agnieszka Adaszyńska², Krzysztof Kujawa³ and Angelika Chachaj^{2,*}

Physical Therapy Modalities for Lipedema


- Manual lymphatic drainage (MLD)
- Compression garments
- Vibration therapy
- FlexiTouch mechanical compression

Effect of pneumatic compression device and stocking use on symptoms and quality of life in women with lipedema: A proof-in-principle randomized trial

Thomas Wright¹ , Crystal D. Scarfino¹ and Ellen M. O'Malley² 




Phlebology
2023, Vol. 38(1) 51–61
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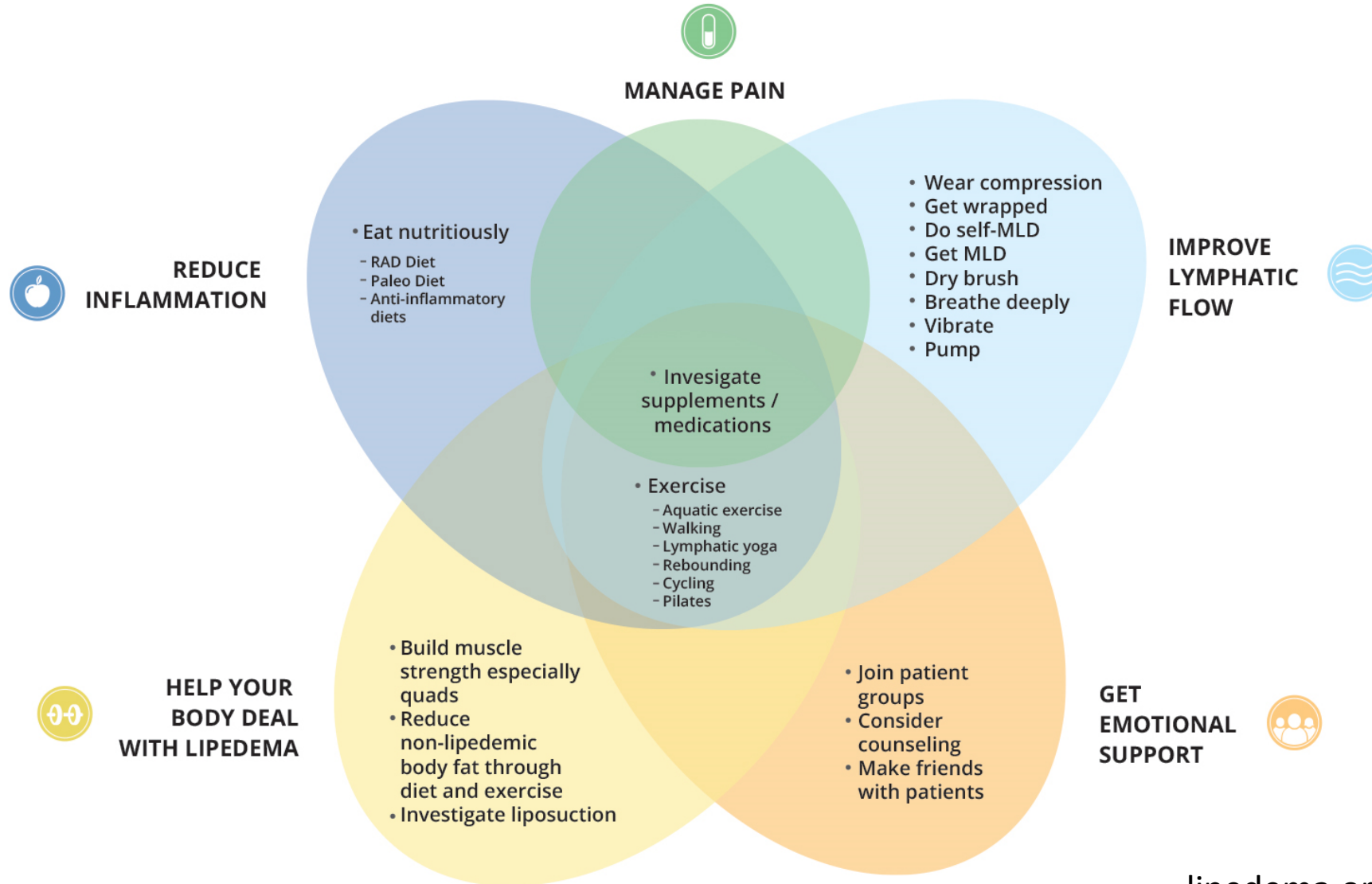
Article

The Usefulness of the Application of Compression Therapy among Lipedema Patients-Pilot Study

Monika Czerwińska^{1,*} , Jacek Teodorczyk², Dawid Spychała¹  and Rita Hansdorfer-Korzon¹ 



Comprehensive Nonsurgical Lipedema Treatment



Liposuction

Subcutaneous fat removal with long metal tube (cannula)

Can be done awake or with anesthesia

Requires tumescent fluid pre-injection

Does not tighten skin



Lipedema Liposuction Outcomes

- 250 Patients
- Before & after liposuction
- Significant pain reduction

Breaking the circle-effectiveness of liposuction in lipedema

Tobias Seefeldt^{1,2,3,*} | Marie-Luise Kietz-Aitzetmüller^{1,2,3,*} | Maximilian Kückelhaus^{1,2,3} |
Philipp Wiebringhaus^{1,2,3} | Tobias Hirsch^{1,2,3} | Kamran Harati^{1,2,3,#} |
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³Department of Plastic, Reconstructive, and Aesthetic Surgery, Hand Surgery, Fachklinik Hornheide, Muenster, Germany

Summary

Background: Lipedema is a common chronic fat distribution disorder often aligned with pain and reduced quality of life affecting 6–10% of the female population. Although lipedema has acquired more scientific attention in the last decade, validated diagnosis and treatment still remain challenging for specialists.

Patients and Methods: In this article we evaluate the effect of liposuction on appearance, pain and coexisting diseases of 860 patients with lipedema. Compar-



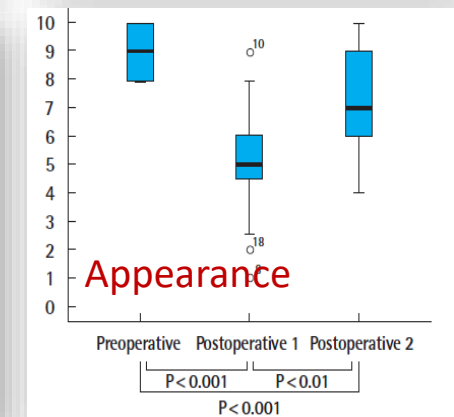
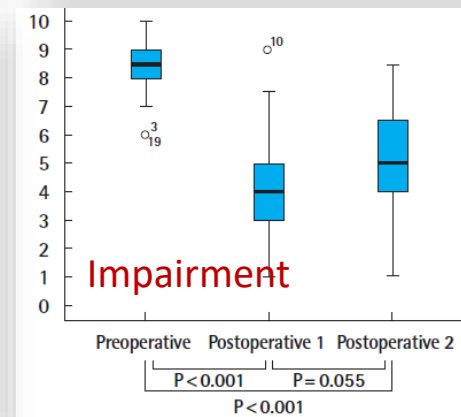
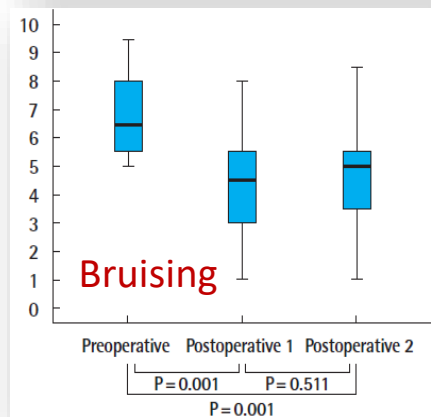
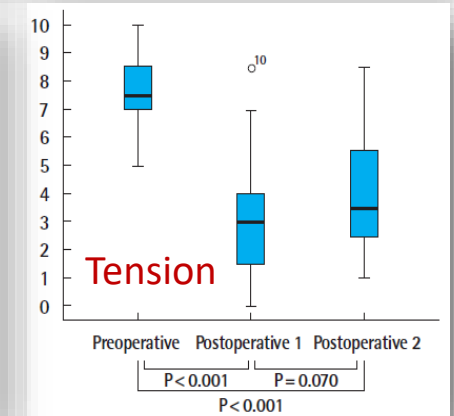
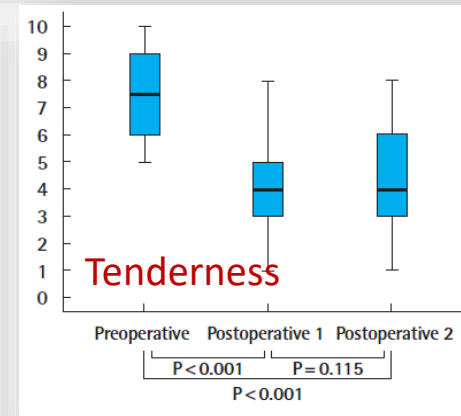
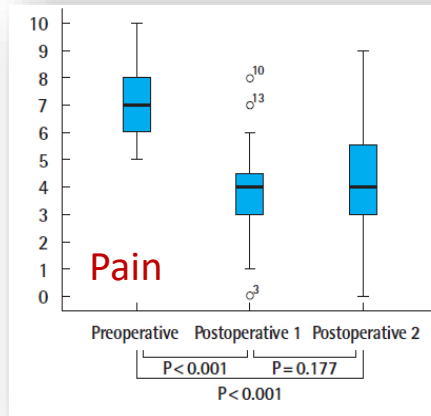
Lipedema Liposuction Longitudinal Outcomes

- 21 Patients
- 16 & 37-month follow up
- Improved QOL
- Need fewer other therapies
- Early treatment = better results

Liposuction in the Treatment of Lipedema: A Longitudinal Study

Mehran Dadras^{1,2}, Peter Joachim Mallinger³, Cord Christian Corterier¹, Sotiria Theodosiadi¹, Mojtaba Ghods¹

¹Department of Plastic Surgery, Klinikum Ernst von Bergmann, Potsdam; ²Department of Plastic Surgery, BG University Hospital Bergmannsheil, Ruhr-University Bochum, Bochum, Germany; ³Department of Plastic Surgery, Klinikum Klagenfurt am Wörthersee, Klagenfurt am Wörthersee, Austria





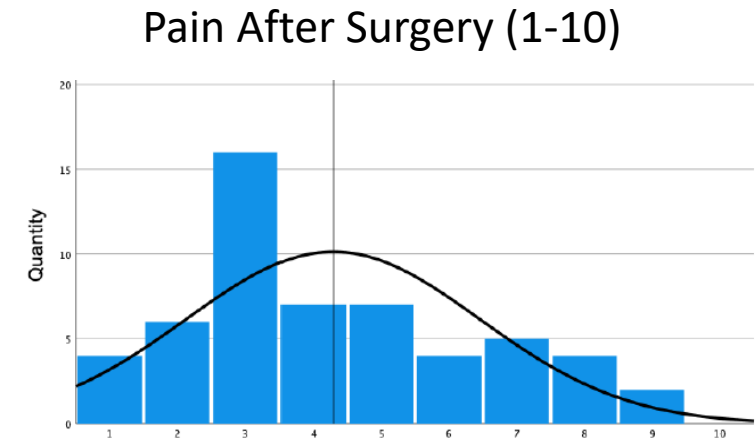
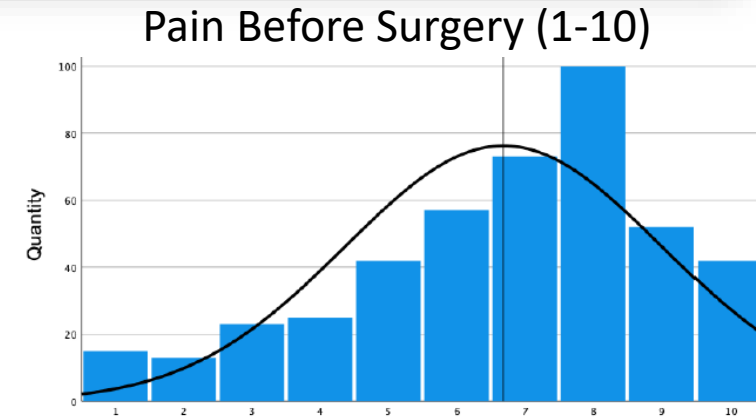
Lipedema Liposuction Patient Reported Outcomes

- Median 3 month follow up
- Significant pain reduction
- High satisfaction

Article

Patient-Reported Outcomes of Liposuction for Lipedema Treatment

Fiona Kirstein ^{1,2,†} , Matthias Hamatschek ^{1,2,†}, Henning Knors ^{1,2,3}, Marie-Luise Aitzetmueller-Klietz ^{1,2,3}, Matthias Aitzetmueller-Klietz ^{1,2,3}, Philipp Wiebringhaus ^{1,2,3} , Charalampos Varnava ^{1,2,3}, Tobias Hirsch ^{1,2,3} and Maximilian Kueckelhaus ^{1,2,3,*}



Lipedema Liposuction 10-Year Outcomes

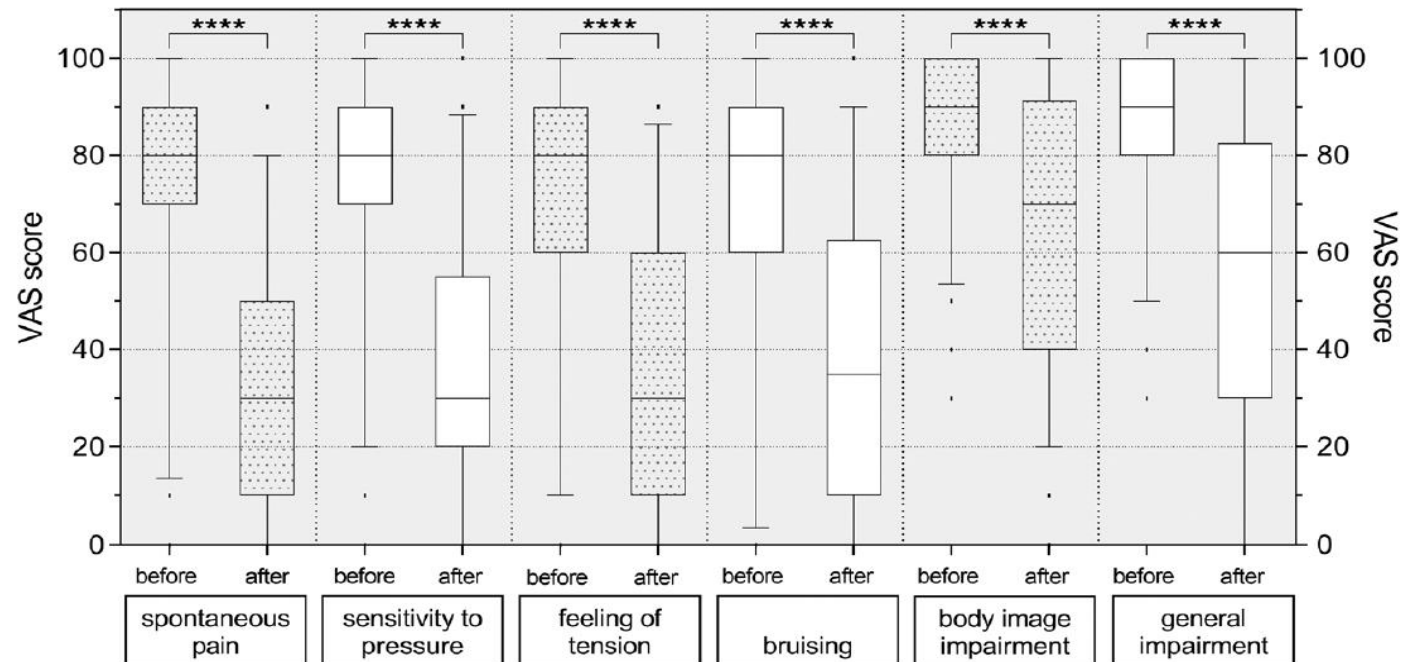
- 106 Patients
- 298 large-volume liposuctions
- 20-month median follow up

A 10-Year Retrospective before-and-after Study of Lipedema Surgery: Patient-Reported Lipedema-Associated Symptom Improvement after Multistage Liposuction

Philipp Kruppa, M.D.
Iakovos Georgiou, M.D.
Jeremias Schmidt, M.D.
Manfred Infanger, M.D., Ph.D.
Mojtaba Ghods, M.D., Ph.D.
Potsdam and Magdeburg, Germany

Background: Despite an increasing demand for surgical treatment of lipedema, the evidence for liposuction is still limited. Little is known about the influence of disease stage, patient age, body mass index, or existing comorbidities on clinical outcomes. It was hypothesized that younger patients with lower body mass index and stage would report better results.

Methods: This retrospective, single-center, noncomparative study included lipedema patients who underwent liposuction between July of 2009 and July of



Lipedema Liposuction Outcomes After 12 Years

- Continued improvement in pain, tenderness, movement, bruising, QOL, need for treatments
- Mean weight change
 - 55% -6.2 kg
 - 43% +7.9 kg

Tumescent liposuction in lipoedema yields good long-term results

W. Schmeller, M. Hueppe* and I. Meier-Vollrath

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Long-term benefit of liposuction in patients with lipoedema: a follow-up study after an average of 4 and 8 years

A. Baumgartner,¹ M. Hueppe² and W. Schmeller¹

¹Hanse-Klinik, St-Juergen-Ring 66 D-23564 Luebeck, Germany

²Department of Anaesthesiology and Intensive Care, University of Luebeck, Ratzeburger Allee 160, D-23538 Luebeck, Germany

Improvements in patients with lipedema 4, 8 and 12 years after liposuction

Axel Baumgartner ¹, Michael Hueppe ², Ilka Meier-Vollrath ¹, Wilfried Schmeller ¹

Affiliations

PMID: 32847472 DOI: [10.1177/0268355520949775](https://doi.org/10.1177/0268355520949775)

Survey Outcomes After Liposuction

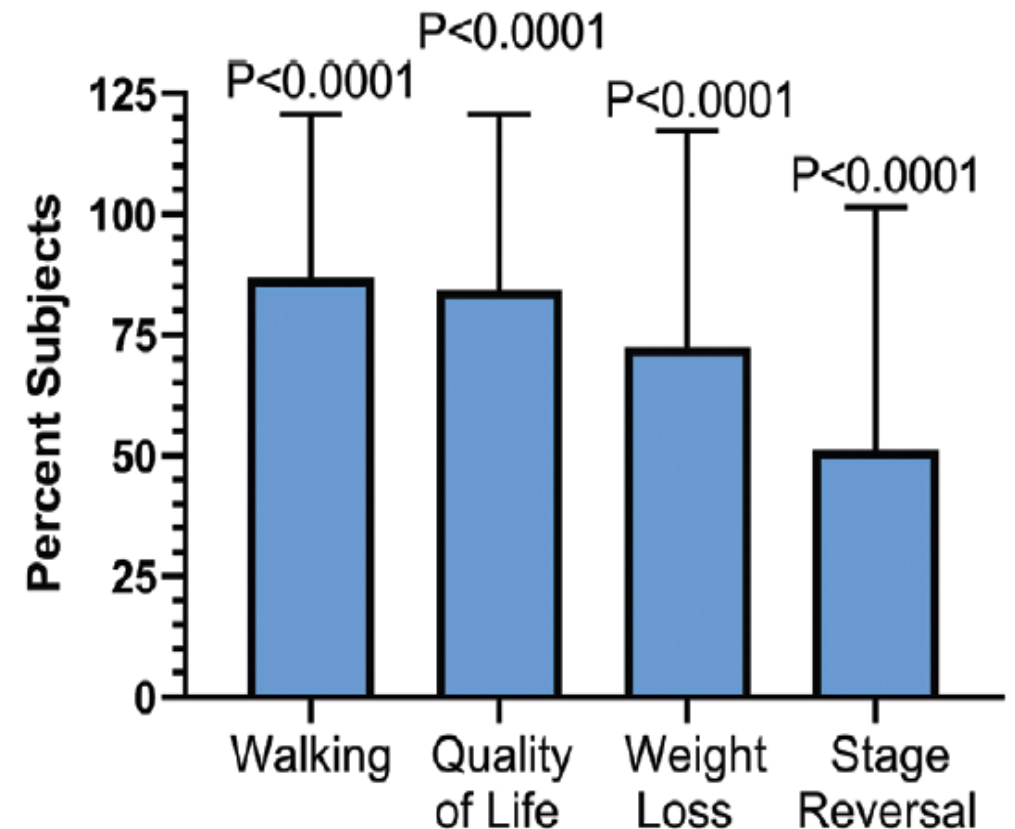
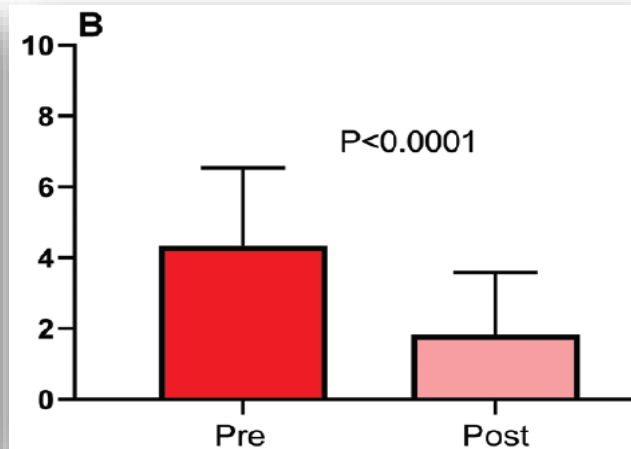
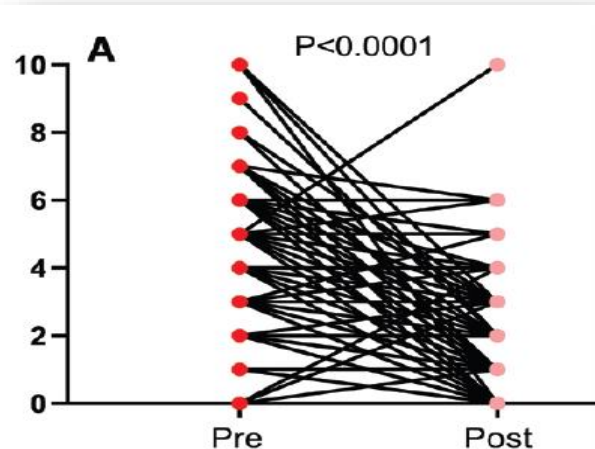
148 patients, mean 1.6 year follow up

Survey Outcomes of Lipedema Reduction Surgery in the United States

Karen L. Herbst, PhD, MD*||
Emily A. Hansen, BS†
Leopoldo M. Cobos Salinas,
MD‡§
Thomas F. Wright, MD§
Ethan E. Larson, MD¶
Jaime S. Schwartz, MD, FACS||**

Background: Lipedema is a loose connective tissue disease affecting the limbs of women, that is difficult to lose by diet, exercise, or bariatric surgery. Publications from Europe demonstrate that lipedema reduction surgery improves quality of life for women with lipedema. There are no comparable studies in the United States (USA). The aim of this study was to collect data from women with lipedema in the USA who have undergone lipedema reduction surgery in the USA to determine if quality of life, pain, and other measures improved after lipedema reduc-

Pain reduction after liposuction



Survey Outcomes After Liposuction

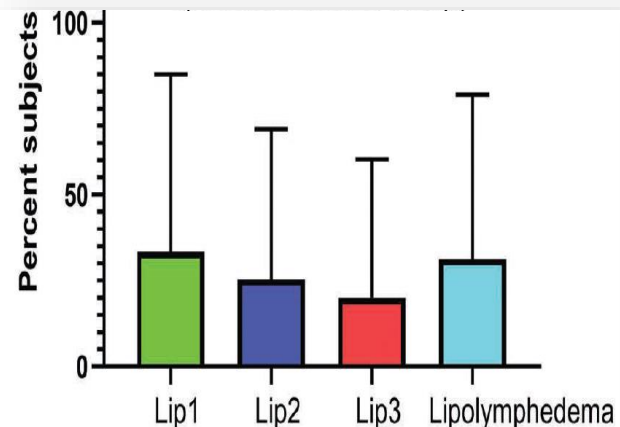
Adverse outcomes

Survey Outcomes of Lipedema Reduction Surgery in the United States

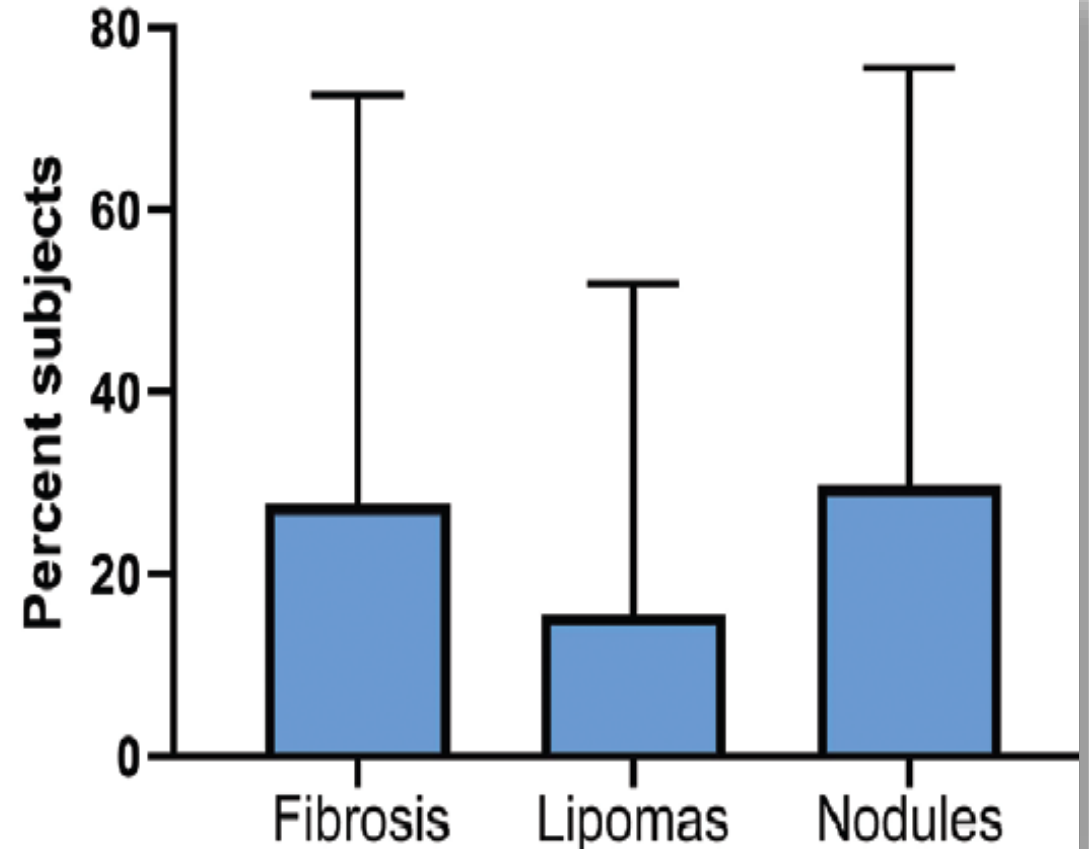
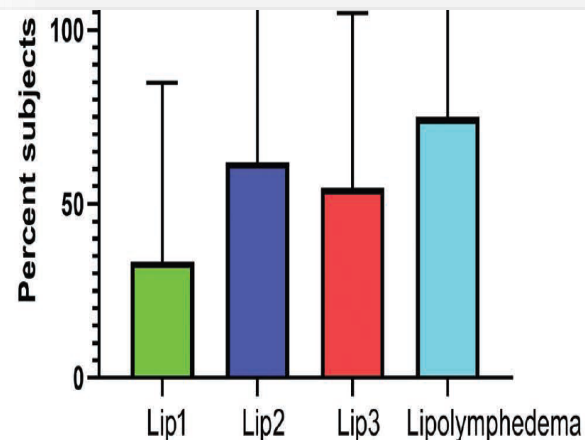
Karen L. Herbst, PhD, MD*+||
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Tissue regrowth treated areas



Tissue regrowth **untreated** areas

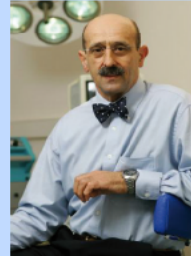


Liposuction to Prevent Knee Joint Complications

- Inner thigh & knee debulking may reduce risk of knee joint damage

Liposuction of Lipedema to Prevent Later Joint Complications

Josef Stutz, Schwarzenbach am Wald



Josef Stutz

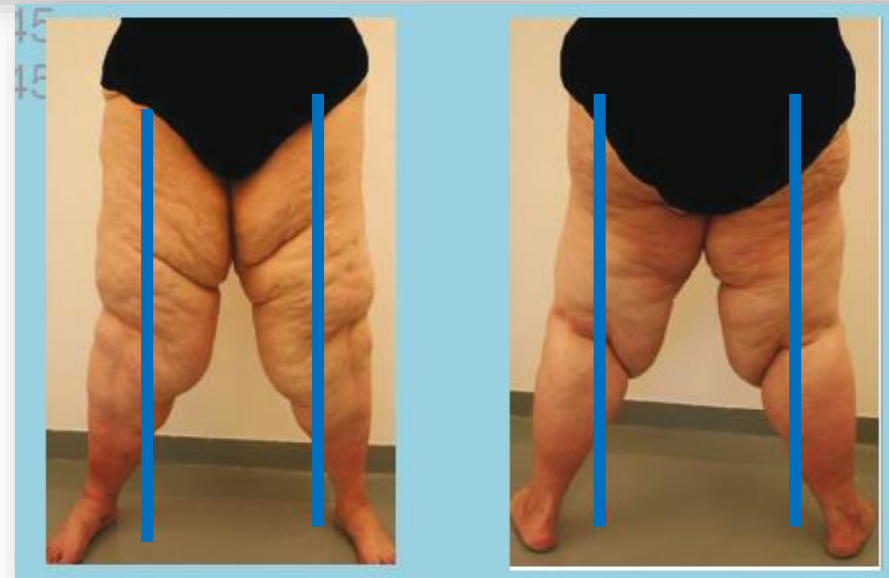
Summary

Lipedema is a symmetric fat disorder in women which affects their legs and arms.

Abnormal fat accumulations at the proximal inner thigh cause an abduction of the leg axis which leads to a change in gait, and to an unnatural physiological strain on the leg joints (knock knee).

Using liposuction, this abnormal fat can be reduced, and the leg axis and gait can be corrected.

Key words: lipedema, leg axis, knock-knee, arthrosis.







Improved Angle Between Knees

After high volume liposuction, thigh & knee skin excision

Standard of care for lipedema in the United States

Karen L Herbst^{1,2,3} , Linda Anne Kahn^{2,4}, Emily Iker^{2,5},
Chuck Ehrlich^{2,6}, Thomas Wright^{2,7} , Lindy McHutchison^{2,8},
Jaime Schwartz^{2,3}, Molly Sleigh^{2,9}, Paula MC Donahue^{2,10},
Kathleen H Lisson^{2,11}, Tami Faris^{2,12}, Janis Miller^{2,13},
Erik Lontok^{2,14}, Michael S Schwartz^{2,15}, Steven M Dean^{2,16},
John R Bartholomew^{2,17}, Polly Armour^{2,18},
Margarita Correa-Perez^{2,19}, Nicholas Pennings^{2,20},
Edely L Wallace^{2,21} and Ethan Larson^{2,22}

Phlebology

0(0) 1–18

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Standard of care for lipedema in the United States

Phlebology
2021, Vol. 36(10) 779–796
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4.2. Lipedema reduction surgery utilizes suction lipectomy (liposuction), excision and manual extraction that spares blood and lymphatic vessels.

The types of suction lipectomy recommended for people with lipedema are based around tumescent liposuction which uses a solution injected into the tissue to decrease pain and bleeding. Other mechanical methods can also be used such as Water Assisted Liposuction (WAL) and Power Assisted Liposuction (PAL)

To date, all studies showing clinical improvements for women with lipedema used **tumescent** or **WAL** techniques.^{110–112,119} **NOT TRUE. Most studies used PAL. NO studies show WAL is better.**

There is **little published information** on the safety of **laser or ultrasound technology** for removing lipedema tissue. **Half TRUE – there is NO useful information**

Standard of care for lipedema in the United States

Phlebology

2021, Vol. 36(10) 779–796

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4.13. Lipedema reduction surgery can be safely performed under local or general anesthesia.

Considerations

Limits of local anesthetic based on patient's weight

Rare cases of local anesthetic nonresponse in Ehlers Danlos Syndrome patients

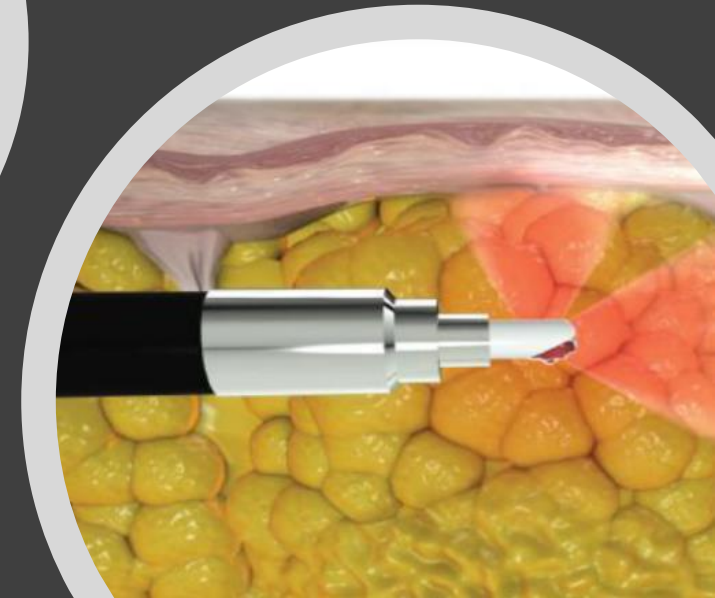
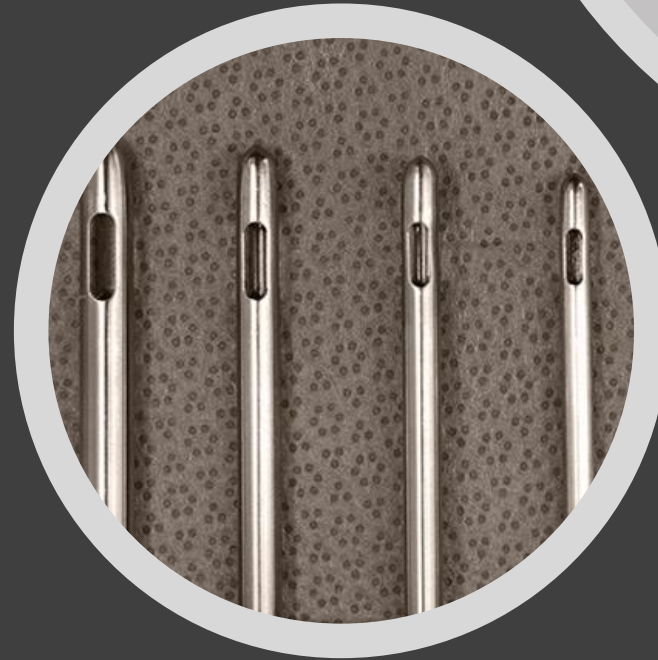
Anesthesiologist present for anything more than mild sedation

Liposuction



Liposuction Techniques

- Power PAL
- Traditional SAL
- Water WAL
- Laser LAL
- Ultrasound UAL
- Vaser VAL
- Radiofrequency RFAL
- Renuvion



It's the SURGEON, not the tool



lipedema



Search

- Lipedema 472 results
- Lipedema Treatment 291 results
- Lipedema Surgery 177 results
- Lipedema Liposuction 96 results
 - Primary studies on liposuction 24 publications (3 on same patient cohort)
 - Reviews of literature/opinions 72 publications
- Comparative liposuction studies 0
- Randomized controlled studies 0
- Lymphatic Sparing Liposuction 7 results 0 related to Lipedema

Best Study: Power Assisted Lipo

SURGICAL DERMATOLOGY

2015

BJD
British Journal of Dermatology

Long-term benefit of liposuction in patients with lipoedema: a follow-up study after an average of 4 and 8 years

A. Baumgartner,¹ M. Hueppe² and W. Schmeller¹

- Follow up of previous study
- Compared to 4 years, improvement in pain, sensitivity to pressure, edema, bruising, restricted movement, patient self-assessment cosmetic appearance, quality of life & overall impairment persisted
- At 8 years, reduction in amount of conservative treatment similar to 4 years
- Demonstrates long-lasting positive effects of **power assisted liposuction**
- **2020 published update following 60 patients for 12 years**

Does Water Liposuction Matter?

Aesth Plast Surg
DOI 10.1007/s00266-008-9214-y

2008

ORIGINAL ARTICLE

Water Jet-Assisted Liposuction for Patients with Lipoedema: Histologic and Immunohistologic Analysis of the Aspirates of 30 Lipoedema Patients

J. J. Stutz · D. Krah

- False & unsupported claims about tumescent fluid & liposuction
- Analyzed the **removed fat tissue**, not what was left behind
- Did **not** compare to any other liposuction technique
- Very low fat removal volumes
- No clinical results measured

Does Water Liposuction Matter?

Water-jet-assisted liposuction for the treatment of lipedema: Standardized treatment protocol and results of 63 patients

Thomas Witte  ¹  • Mehran Dadras ¹ • Falk-Christian Heck • Marion Heck • Brigitte Habermalz •
Stefan Welss • Marcus Lehnhardt • Björn Behr • [Show less](#) • [Show footnotes](#) 2020

- 63 patients, median age 35, mean **BMI 28.4 ± 0.6**, all **Stage I or II lipedema**
- Mean follow-up 22 months - all assessed symptom decreased significantly
- Conclusion: WAL is efficient in treatment of early-stage lipedema
- **Conflict of Interest: 2 authors have relationship with WAL**

PATIENT SAFETY

2009

Outcomes Article

Evidence-Based Patient Safety Advisory: Liposuction

Phillip C. Haeck, M.D.
Jennifer A. Swanson, B.S.,
M.Ed.
Karol A. Gutowski, M.D.
C. Bob Basu, M.D., M.P.H.
Amy G. Wandel, M.D.
Lynn A. Damitz, M.D.
Neal R. Reisman, M.D., J.D.

Summary: Liposuction is considered to be one of the most frequently performed plastic surgery procedures in the United States, yet despite the popularity of liposuction, there is relatively little scientific evidence available on patient safety issues. This practice advisory provides an overview of various techniques, practices, and management strategies that pertain to individuals undergoing liposuction, and recommendations are offered for each issue to ensure and enhance patient safety. (*Plast. Reconstr. Surg.* 124 (Suppl.): 28S, 2009.)

How Much Fat Can be Removed?

5000 cc
limit

- Includes removed fat **and** fluid

Otherwise

- **Staged** – 2 or more outpatient procedures
- **Monitored overnight** – 1 procedure but higher cost

But no
evidence

- Accepted by most surgery facilities & law in some states

Is There a Safe Lipoaspirate Volume? A Risk Assessment Model of Liposuction Volume as a Function of Body Mass Index

Ian Chow, B.A.
Mohammed S. Alghoul,
M.D.
Nima Khavanin, B.S.
Philip J. Hanwright, M.D.
Kristen E. Mayer, B.S.
Keith M. Hume, M.A.
Robert X. Murphy, Jr., M.D.,
M.S.
Karol A. Gutowski, M.D.
John Y. S. Kim, M.D.

Background: No concrete data exist to support a specific volume at which liposuction becomes unsafe; surgeons rely on their own estimates, professional organization advisories, or institutional or government-imposed restrictions. This study represents the first attempt to quantify the comprehensive risk associated with varying liposuction volumes and its interaction with body mass index.

Methods: Suction-assisted lipectomies were identified from the Tracking Operations and Outcomes for Plastic Surgeons database. Multivariate regression models incorporating the interaction between liposuction volume and body mass index were used to assess the influence of liposuction volume on complications and to develop a tool that returns a single adjusted odds ratio for any combination of body mass index and liposuction volume. Recursive parti-

Limit should be based on BMI

More than 100 cc per BMI increases complications

Most common complication: Seroma (fluid collection)

Not yet accepted by most surgical facilities or laws

Is There a Liposuction Limit?

Liposuction: Awake vs Anesthesia

Awake

- Dilute lidocaine under skin
- Ideal for smaller areas
 - Arms
 - Calves
 - Smaller thighs
- May need to do 2-3 procedures
- Lower cost (Office OR)
- Limited by anesthetic dose

Anesthesia

- Use less dilute lidocaine
- Larger or multiple areas
- Patients with anxiety issues
- Higher cost (Hospital OR)
- Some EDS patients don't respond to lidocaine

Tumescent Technique

- **Epinephrine** 1 mg per 1000 mL normal saline
- **Lidocaine** per 1000 mL NS
 - 300 mg if with anesthesia
 - 800 to 1000 mg if awake (+ 10 mL 8.4% sodium bicarbonate)
 - Respect 45-55 mg/Kg limit (Intralipid)
- **Tranexamic Acid IV**
- If awake – narrow cannula at lowest infiltration setting
 - +/- Nitrous oxide (ProNox)
- “Fountain sign” tense
- Wait **20 minutes** for full vasoconstriction



My Experience

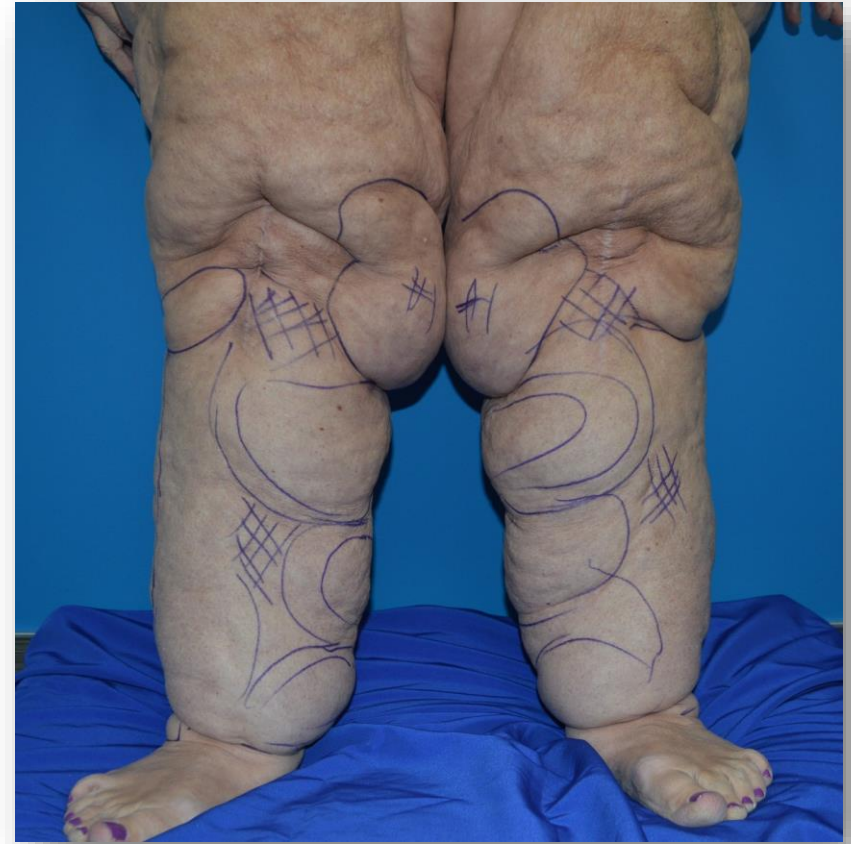
- 400+ cases over 20 years
- Process similar to MWL patient...
but without the weight loss



Full Lower Extremity Lipedema

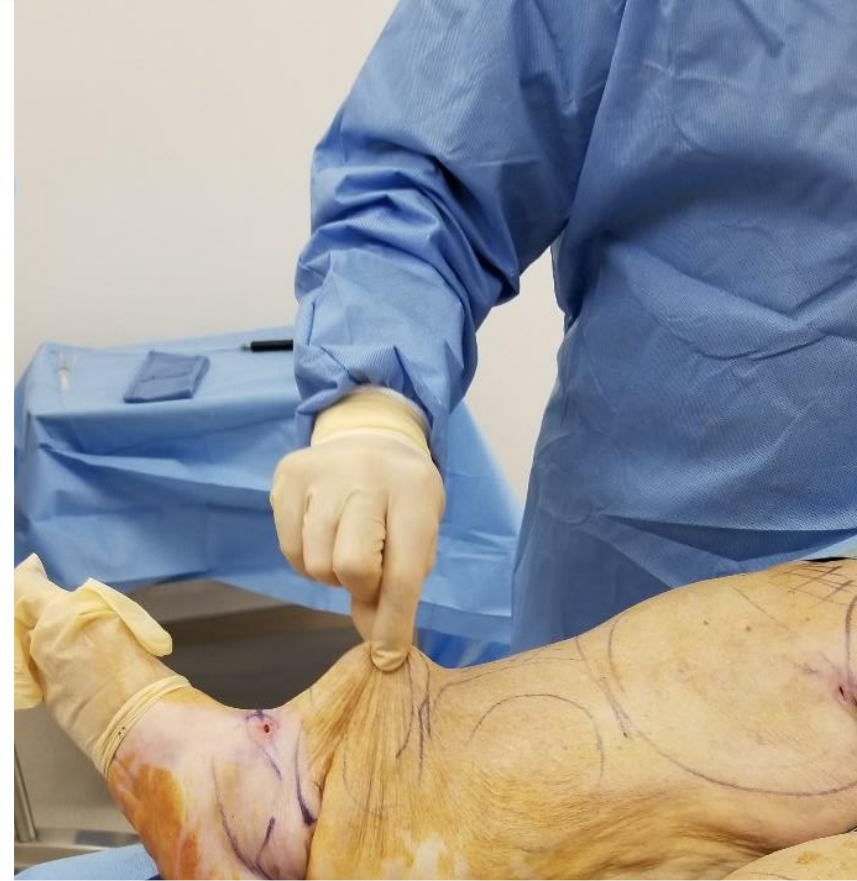
Desires Awake Procedure





Anterior Calf & Inner Knee Liposuction

6 L lipoaspirate – Done Awake



Awake Ankle Sculpting & Calve Skin Thinning

After 3
Awake
Sessions &
16 L
Lipoaspirate



Lost 60 lbs after this point

Stage I & II with Tight Skin

Liposuction Alone



Stage I & II with Tight Skin

Liposuction Alone



Stage II & III with Fair Skin

Liposuction Only – Calve Skin Contracts





Stage II Older, Poor Skin, Ankle Fat Pockets



Stage II Older, Poor Skin, Ankle Fat Pockets



Stage II Older, Poor Skin, Ankle Fat Pockets



Ankles & Below Ankles

Liposuction 2 Stages

Improved
ambulation &
balance



Liposuction 2 Stages

- 3 awake PAL sessions
- 16 L removed
- Declined thigh skin excision
- Able to hike Grand Canyon



Don't Promise Smooth Skin





More than 5 Liters = High Volume Liposuction

19.5 L (15.6 L of fat) removed. About 31 pounds of fat

High Volume Liposuction Considerations

- Overall medical condition
- Body areas being treated
- BMI
- HgB (g/dL) & Lipoaspirate

> 14	13 – 15+ L
13 – 14	10 – 13 L
< 13	≤ 10 L
- Can't predict postoperative oozing
 - May persist for 2 – 3 days



Know When to Stop

Both Patients Needed Blood Transfusion



12.2 L **Bloody**



18.9 L Not Bloody

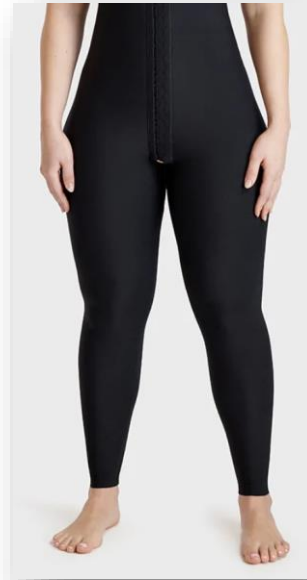
High Volume Liposuction Postoperative Care

- 1 to 2 days in hospital
- Fitted compression garments
- Nurses trained on care of HVL lipedema patients
- IVF 200 mL/hr
 - Adjust based on urine output
 - Albumin 5% 500 mL intraoperatively
- Urinary catheter for urine output
- CBC & Chem7 in evening and in morning
- Sitting before assisted ambulation



Postoperative Protocol

- Early ambulation
- Constant compression
- Manual drainage as needed



Watch for Rare Skin Compromise



Blisters resolved with conservative care



Tissue necrosis treated with NPWT



Excisional Procedures

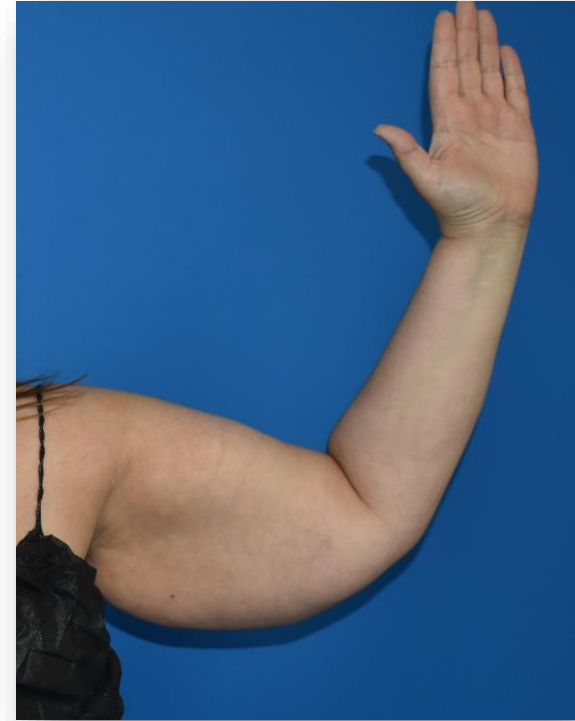
Anatomic Site

- Arm
- Forearm
- Abdomen
- Back
- Buttock
- Thigh
- Calf



Skin & Tissue Excision

- More lipedema tissue removed
- Better body contouring
- Less loose tissue to retain fluid
- Reduce risk of skin irritation
- Better function & activity



Surgical Plan: Arms

Liposuction upper arms +/- forearms

- Awake vs anesthesia

Arm skin excision

- Upper arm +/- forearm
 - Upper arm
 - Posterior (preferred) or medial incision
 - Forearm
 - Volar/ulnar
- At same time as liposuction in most cases
- Staged if good skin tone & low fat volume



Surgical Plan: Legs

Liposuction thighs & calves

- Awake vs anesthesia
 - Calves alone - awake
- 360° or as needed

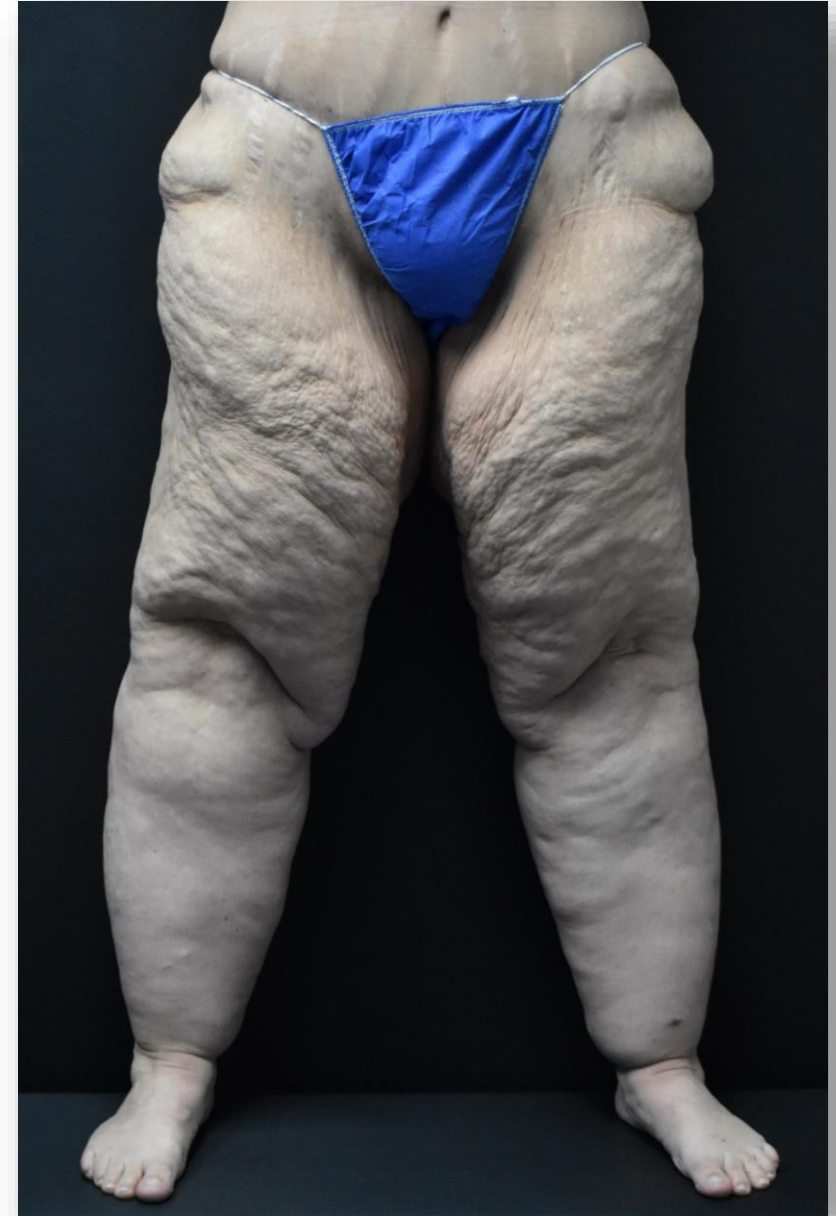
Thigh skin excision

- Usually staged (≥ 6 months)
- Medial vs anterior scar

Calf skin excision

- Immediate
- Posterior (or medial) incision

Knee skin Excision





Staged Liposuction & Excision |

Stage II & III with Fair Skin

Liposuction + Upper Thigh Lift

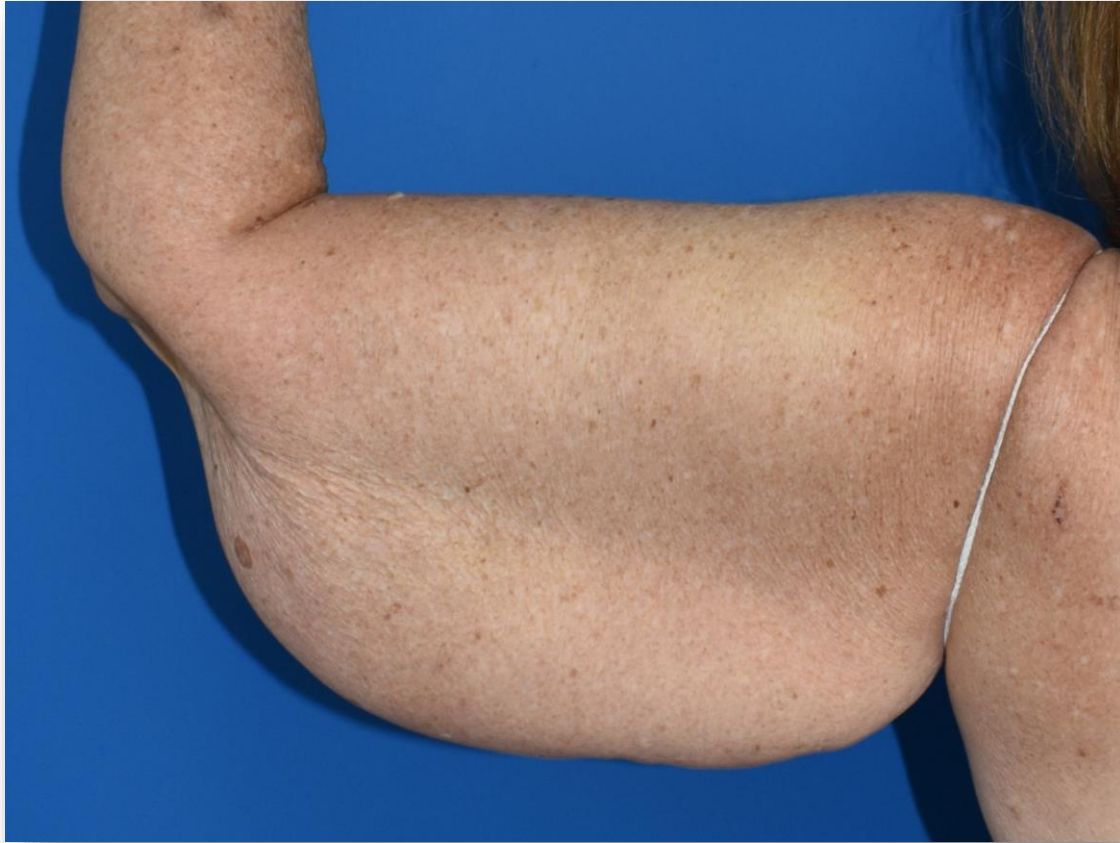




Stage II & III with Loose Skin

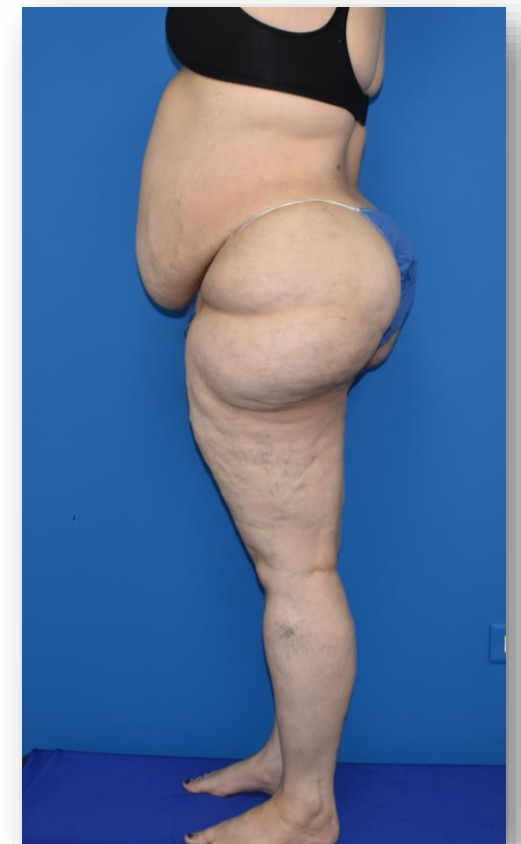
Staged Liposuction then Full Thigh Lift

Combined Liposuction & Skin Excision



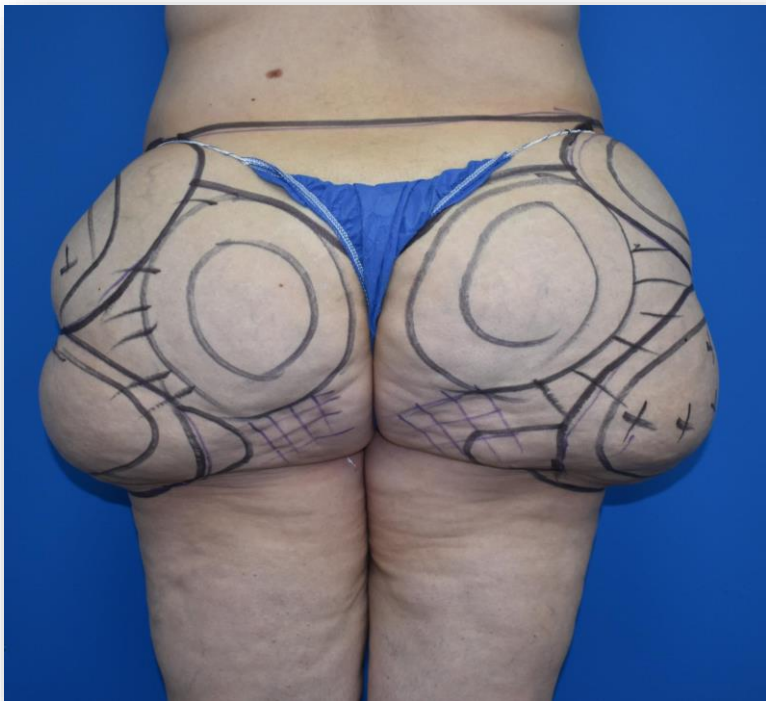
Arm Lift & Forearm Lift





Painful Buttock Lipedema
Appeared after 3 rounds of IVF

Stage 1 (Awake Liposuction)





Stage 2 (Liposuction + Excision)

Before & 3 Months After 2nd Stage



Before & 3 Months After 2nd Stage



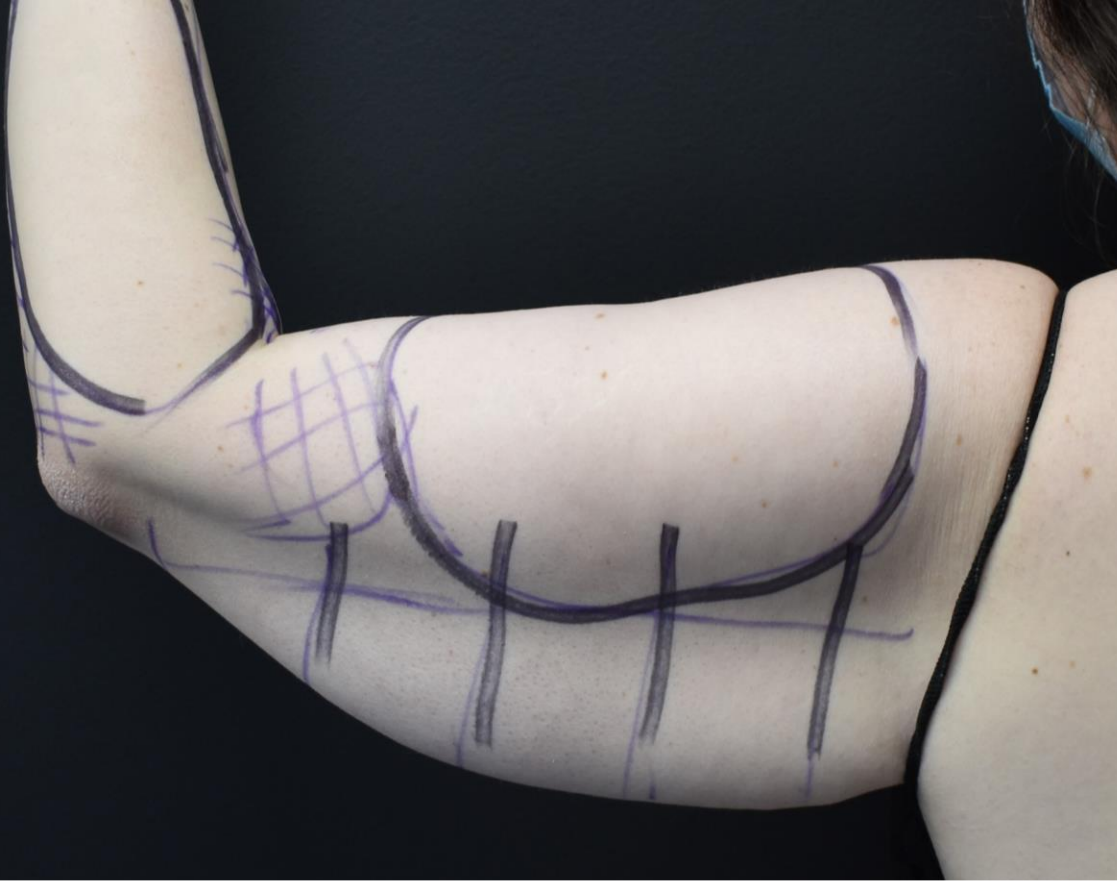
Before & 3 Months After 2nd Stage



Buttock Lipedema Tissue Excision

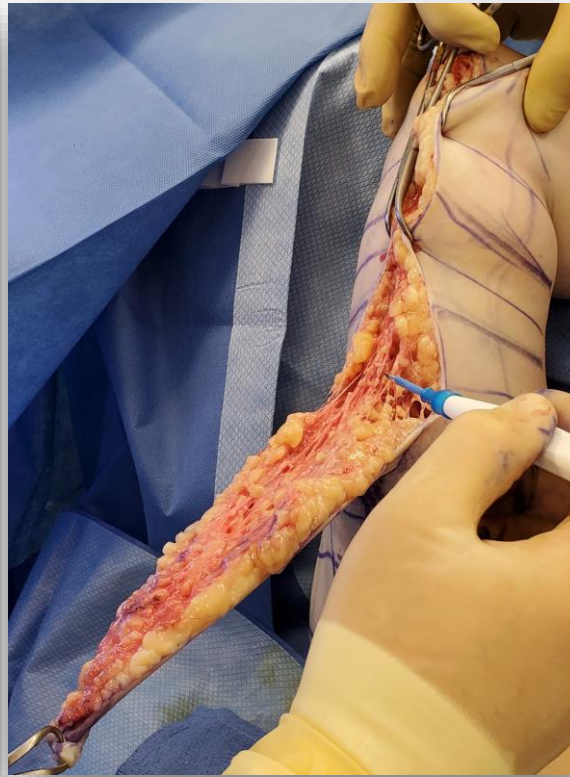
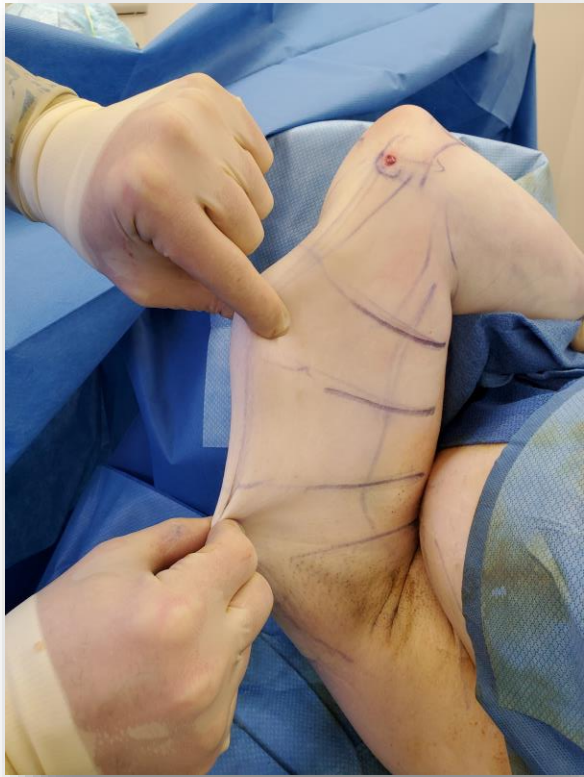
Staged Liposuction then Excision





Arm Treatment: Liposuction + Skin Excision

Liposuction with Posterior Arm Lift





Before & 6 Months After

What Kind of Thigh Skin Excision?





Cut Where the Loose Skin Is

Before, 2 Weeks and 6 Weeks After

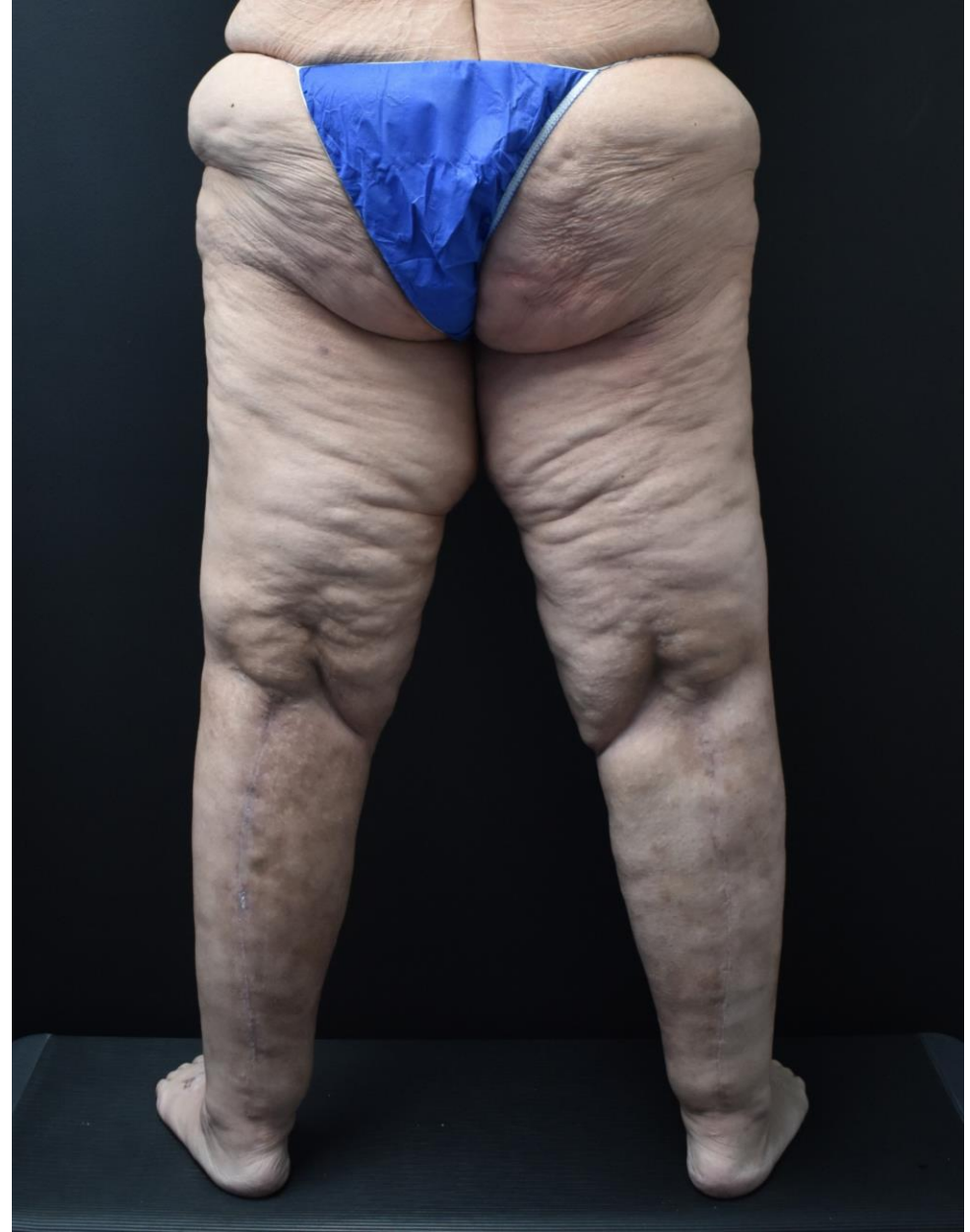


Calve Skin Excision









Abdominal Liposuction Not Enough



Direct Excision of Lipedema Nodules



Challenging Case

- Limited Mobility
- What to do with loose skin
 - Compression garments won't work
 - Risk of skin damage
 - Will collect fluid leading to fibrosis
- Offered immediate skin excision
- Where to remove the skin?

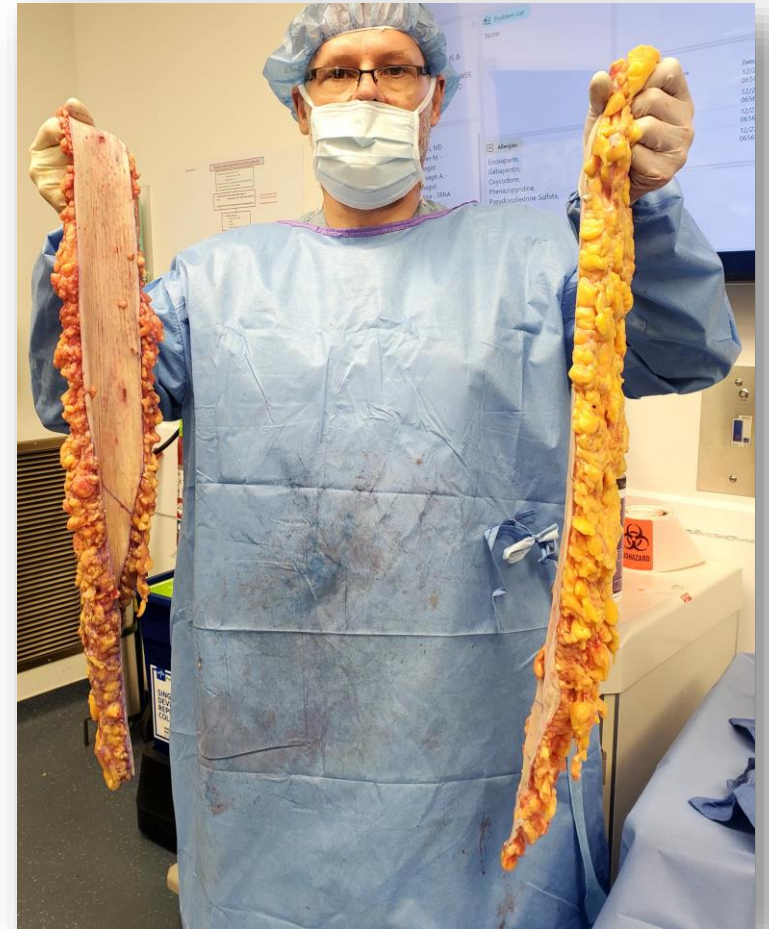
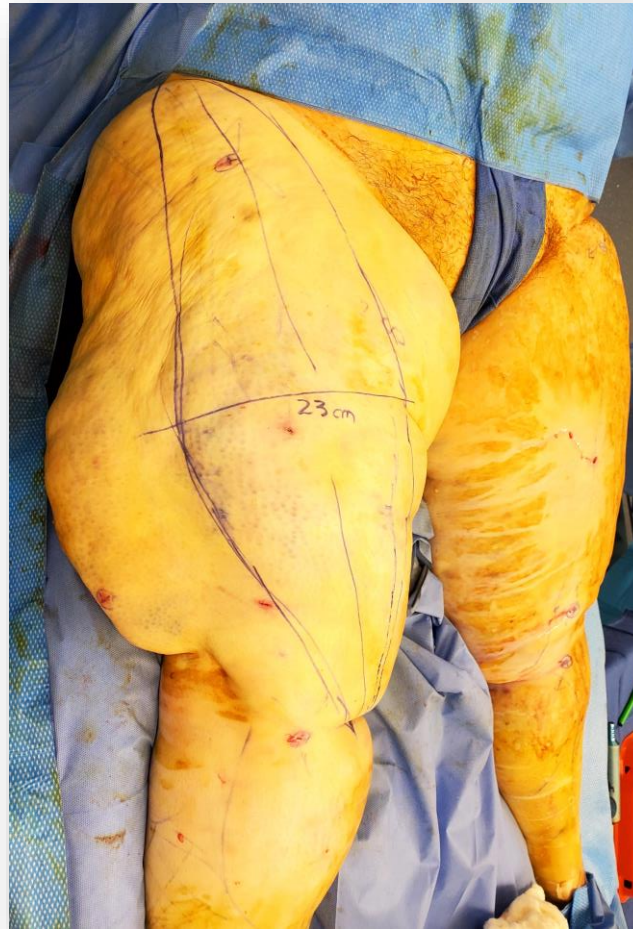


Challenging Case

- Limited Mobility
- What to do with loose skin
 - Compression garments won't work
 - Risk of skin damage
 - Will collect fluid leading to fibrosis
- Offered immediate skin excision
- Where to remove the skin?
- 25 L lipoaspirate (20 L pure fat, 39 lbs)



Maximal Safe Skin Excision



6 Months Later

Able to walk, care for kids, work, exercise



Lipo-Lymphedema: Staged Surgery



Insurance Coverage for Lipedema

Banafsheh Akhlaghi v. Cigna Health and Life Insurance Company

Case No. 4:19-cv-3754

United States District Court for the Northern District of California



An independent licensee of the Blue Cross and Blue Shield Association

Corporate Medical Policy

Surgical Treatment for Lipedema

File Name: surgical_treatment_for_lipedema
Origination: 5/2022
Last Review: 8/2023

COVER

Lipedema.com

Liposuction = 0 RVU

- Insurance Single Case Agreements
- Medicare & Medicaid difficult to cover (no prior authorization)
- Self Pay option

Why Do I
Do This?

Just letting you know that my legs are continuing to rock it! I finished the Marji Gesick MTB race in the U.P.. Absolutely no way I could have done this before my surgeries.

I took second in women's masters.



Other Midwest Lipedema Surgery Specialists

Coming in 2024

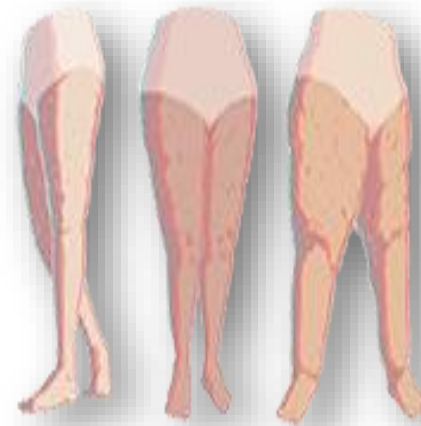


Learn More



FAT DISORDERS
RESOURCE SOCIETY

FatDisorders.org

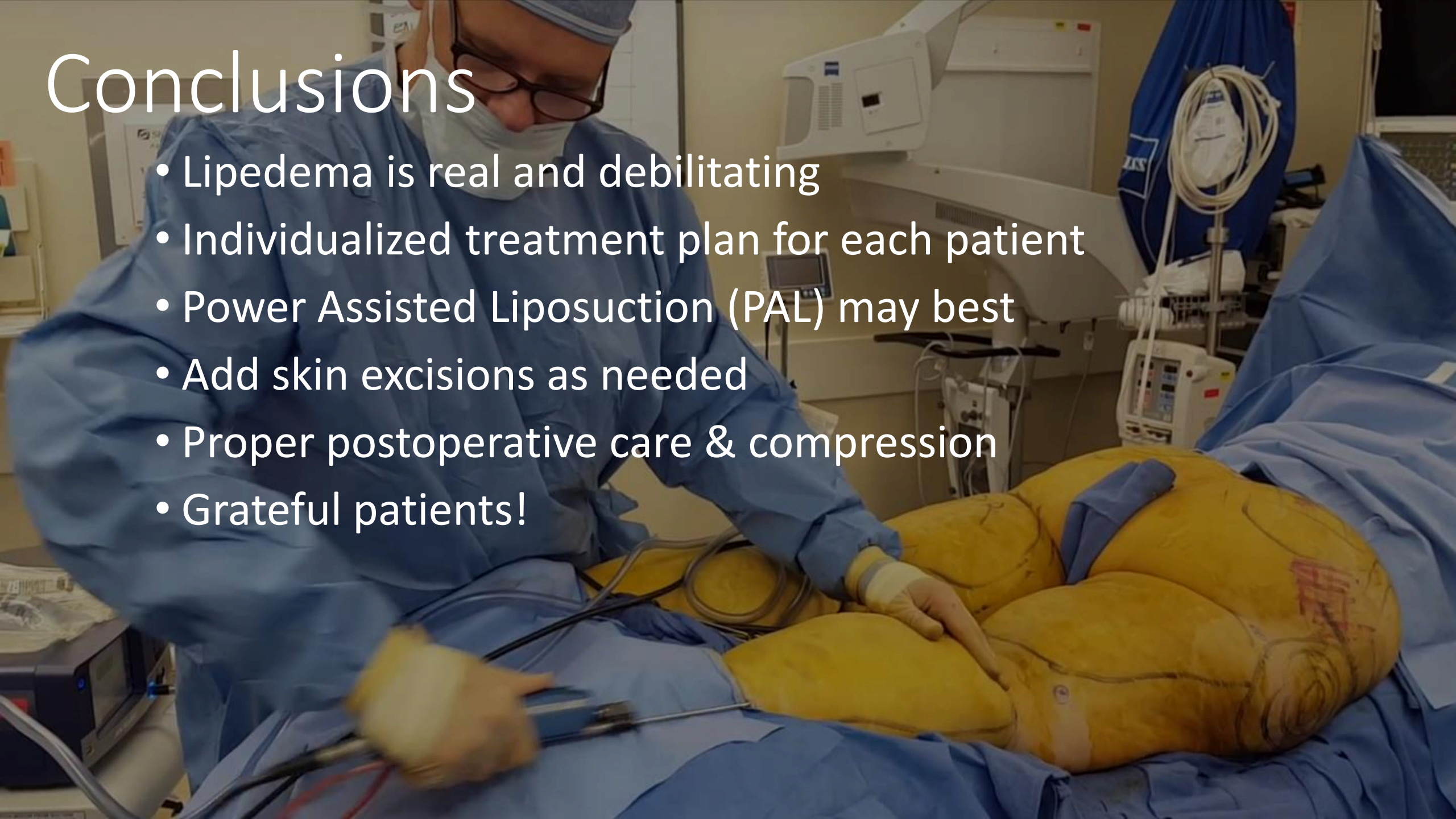


LIPEDEMA
FOUNDATION

Lipedema.org

Conclusions

- Lipedema is real and debilitating
- Individualized treatment plan for each patient
- Power Assisted Liposuction (PAL) may best
- Add skin excisions as needed
- Proper postoperative care & compression
- Grateful patients!





Lipedema & Lipedema Surgery

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