Treatment strategies for lipedema: A scoping review on liposuction, compression therapy, bariatric surgery, and pharmacologic treatment

Sarah Østergaard Holm, MD,[a] Stine Maria Lund Andersen, MD, PhD,[a] and Sigrid Bjerge Gribsholt, MD, PhD[b]

Background: Lipedema is a chronic condition associated with pain, reduced quality of life, and increased prevalence of depression and fibromyalgia. This study aims to conduct a scoping review of treatment options for lipedema, focusing on liposuction, compression therapy, bariatric surgery, and pharmacologic treatment.

Methods: A scoping review was conducted in accordance with the PRISMA statement. Three online databases were used to identify papers published from 2020 to March 2025 by a systematic search strategy.

Results: A total of 27 studies were included. Sixteen studies on liposuction, 9 studies on compression therapy, and 2 studies on bariatric surgery. No studies on pharmacologic treatment of lipedema were identified.

Conclusions: The majority of the studies focused on liposuction or compression therapy, both of which are reported to have beneficial effects in the management of lipedema. In contrast, there is a significant lack of research regarding bariatric surgery and pharmacologic treatments, highlighting a clear need for further studies in these areas. (JAAD Reviews 2026;8:133-6.)

Key words: bariatric surgery; compression therapy; lipedema; lipoedema; liposuction; pharmacologic treatment.

INTRODUCTION

Lipedema is a chronic adipose-tissue disorder characterized by symmetrical, disproportionate, painful fat accumulation, primarily affecting the lower extremities. It predominantly affects women and appears to be influenced by hormonal and multigenic factors, although etiology remains uncertain. Despite frequent obesity coexistence, metabolic syndrome is uncommon.[1] Pain, fatigue, reduced mobility, concurrent depression, and fibromyalgia are common, contributing to stigma, low self-esteem, and diminished quality of life (QoL).[2]

Abbreviations used:

CDT:	complete decongestive therapy
CG:	compression garments
HR:	health-related
IPC:	intermittent pneumatic compression
PA:	physical activity
QoL:	quality-of-life
RYGB:	Roux-en-Y gastric bypass
SG:	sleeve gastrectomy
TL:	tumescent liposuction
VASER:	vibration amplification of sound energy at resonance
WAL:	water-jet assisted liposuction

From the Department of Dermatology, Aarhus University Hospital, Aarhus, Denmark[a]; and Department of Endocrinology, Aarhus University Hospital, Aarhus, Denmark.[b]

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Data statement: All data were obtained from previously published studies. No data from this review have been published elsewhere.

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Correspondence to: Sarah Østergaard Holm, MD, Department of Dermatology, Aarhus University Hospital, Palle Juul Jensens Boulevard 67, Aarhus, 8200 Aarhus N, Denmark. E-mail: sarakd@rm.dk.

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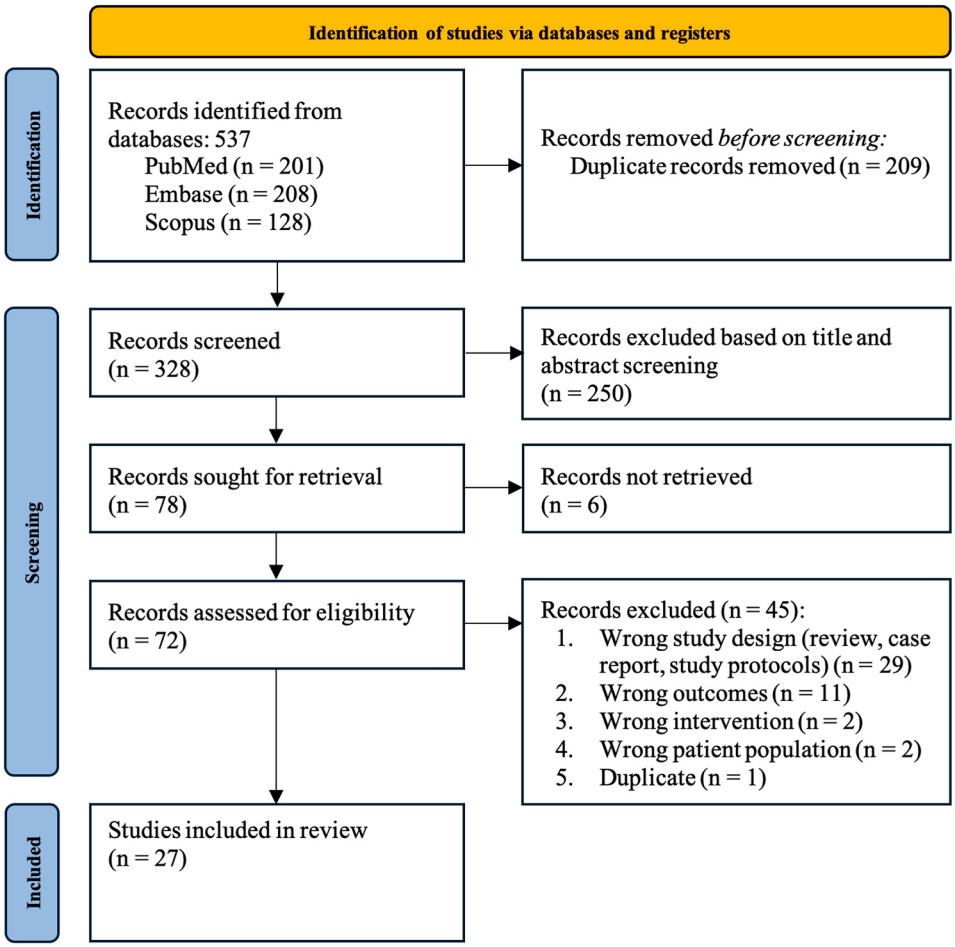

Fig 1. PRISMA flow diagram summarizing the study selection process including identification, screening, and inclusion with exclusion reasons. Duplicates were removed before screening. Records were screened based on title, abstract, and retrieval. Full-text assessment was performed on potentially eligible studies.

The diagnosis is clinical, based on history and examination, as no specific biomarkers exist. Management remains challenging and is largely symptomatic. Liposuction, compression therapy, bariatric surgery, and pharmacological interventions are suggested to alleviate pain, improve mobility, and enhance QoL. However, evidence regarding efficacy, safety, and long-term outcomes remains limited and heterogeneous.[1]

This scoping review maps current evidence on lipedema treatment, identifies knowledge gaps, and highlights priorities for future research.

MATERIALS AND METHODS

A scoping review was conducted following PRISMA guidelines using PubMed, Scopus and Embase. English-language studies published January 2020 to March 2025 reporting original data on liposuction, compression therapy, bariatric surgery, or pharmacologic treatment for lipedema were included. Search strategies were librarian-assisted (Supplementary Fig 1, available via Mendeley at https://doi.org/10.17632/46xn23pws8.1). Screening and selection were performed using Covidence, summarized in a PRISMA diagram (Fig 1). Risk of bias was not assessed, consistent with scoping review methodology.

RESULTS

Twenty-seven studies were included (Table I). Sixteen studies evaluated liposuction using tumescent, power-assisted, water-jet-assisted, or unspecified techniques. Most reported improvements in pain, mobility, mental health, and QoL. Outcomes were primarily assessed via questionnaires; only 2 studies used clinical and biochemical parameters. Most were retrospective with <2 years follow-up, although few reported sustained long-term benefits. Evidence on most effective liposuction technique and ideal disease-stage for intervention remains inconsistent.

Table I. Summary of included studies on lipedema treatment (2020-2025)

Author (Y)	Technique	*N*	Outcomes	Follow-up
Liposuction				
Malcolm (2024)	TL	47	Improved HRQoL, most in stage 3 lipedema	12 mo.
Schlosshauer (2021)	TL	69	QoL improved with more liposuction sessions	6 mo.
Sandhofer (2021)	TL	27	TL was safe under high-volumen anesthesia	44 h.
Hoffmann (2024)	TL & WAL	72	WAL: less trauma, TL: less potassium drop	Immediate
Herbst (2021)	TL & WAL	148	Improved QoL, reduced weight and pain	Mean 20 mo.
Karri (2025)	TL & WAL	76	Improved HRQol. WAL: faster recovery	Mean 25 mo.
Ciudad (2024)	TL, VASER & WAL	24	Lower BMI, few complications, better patient-reported outcomes. Sustained effect.	Mean 19 mo.
ElKiran (2025)	TL, CDT & surgery	19	Combination: reduced thigh circumference, improved QoL and functional capacity	24 mo.
Witte (2020)	WAL	63	Early-stage lipedema. Reduced symptoms.	Mean 22 mo.
Kruppa (2022)	WAL	106	Reduced symptoms, most in early stage	Mean 20 mo.
Klöppel (2024)	Unspecified	35	Improved QoL and psych, reduced pain	6 mo.
Carballeira (2023)	TL, WAL & VASER	967	Liposuction is better than CG, CDT, exercise and diet, but even better in combination	Retrospective
Baumgartner (2021)	Unspecified	60	Long-term symptom reduction	12 y.
Seefeldt (2023)	Unspecified	860	Reduced pain independent of lipedema stage	Retrospective
Kirstein (2023)	Unspecified	56	Improved QoL and symptoms, all stages	Mean 3 mo.
Aitzetmüller-Klietz (2025)	Unspecified	860	Improved HRQoL	Retrospective
Compression therapy				
Esmer (2024)	IPC & CDT	15	Reduced leg volume and circumference	Mean 28.2 d.
Volkan-Yazici (2022)	IPC & CDT	14	Reduced arm volume and circumference	Mean 22.5 d.
Volkan-Yazici (2021)	IPC & CDT	23	Reduced limb volume and circumference	Mean 24 d.
Atan (2021)	IPC, CDT & PA	31	Improved limb volume, pain and function	6 wk.
Wright (2023)	IPC, CDT & CG	36	Reduced leg circumference, better with CG	12 wk.
Phillips (2020)	CG	3	Improved QoL, limb volume reduction	2 wk.
Czerwinska (2023)	CG & PA	6	Improved QoL and symptoms	6 wk.
Ricolfi (2024)	CG & PA	29	Reduced pain and limb volume	4 wk.
Czerwinska (2024)	CG & PA	24	Improved symptoms and QoL	8 wk.
Bariatric surgery				
Fink (2021)	SG & RYGB	31	Reduced thigh volume	45 mo.
Cornely (2022)	SG & RYGB	13	No symptom improvement despite weight loss	Retrospective
Pharmacologic treatment				
-	-	-	-	-

Twenty-seven studies were included: Sixteen studies on liposuction, 9 on compression therapy, 2 on bariatric surgery, and none on pharmacologic treatment. Techniques were specified and outcomes included mainly QoL, lipedema symptoms, pain, and limb volume/circumference. Follow-up ranged from immediate to 12 years, with a mean of 25 months. A Supplementary Table I listing all included studies are available via Mendeley at https://doi.org/10.17632/yhprfkdxmz.1.

CDT, Complete decongestive therapy; *CG*, compression garments; *HR*, health-related; *IPC*, intermittent pneumatic compression; *PA*, physical activity; *QoL*, quality-of-life; *RYGB*, Roux-en-Y gastric bypass; *SG*, sleeve gastrectomy; *TL*, tumescent liposuction; *VASER*, vibration amplification of sound energy at resonance; *WAL*, water-jet assisted liposuction.

Nine studies investigated compression therapy (intermittent pneumatic compression, complex decongestive therapy, compression garments, and ±exercise), all reported symptom relief, reduced limb volume, improved function, and enhanced QoL, with combined approaches yielding superior outcomes.

Two studies assessed sleeve gastrectomy and Roux-en-Y gastric bypass: 1 showed thigh volume reduction; the other found no pain relief despite weight loss. No studies investigated pharmacologic treatment.

DISCUSSION

Evidence centers on liposuction and compression therapy, with minimal support for bariatric methods and none for pharmacologic options.

Liposuction consistently improved pain, mobility, and QoL, although findings were primarily based on small-sample, retrospective cohorts with heterogeneous techniques and short follow-up. Limited long-term-data suggest sustained benefit, but complication risk[3] and cost-effectiveness warrant further evaluation. Stage-specific benefit remains unclear,

and patient-selection-criteria have been proposed to identify likely responders.[1]

Compression therapy alleviated pain and functional impairment, with added benefit from exercise. However, it neither reduced adipose tissue nor prevented further fat accumulation[1] and relies heavily on patient adherence.[4]

Bariatric surgery and pharmacologic interventions remain poorly studied, with only 2 bariatric surgery reports yielding conflicting results. Previous proposed pharmacologic treatments remain insufficient and unadopted, though a recent case series on GLP-1 yielded encouraging preliminary findings.[5]

Overall, data are limited by inconsistent diagnostics, small cohorts, and nonstandardized outcomes.

CONCLUSION

Liposuction and compression therapy provide symptomatic relief, but evidence remains insufficient to guide optimal treatment. High-quality studies are needed on long-term efficacy, patient selection, and bariatric and pharmacologic interventions.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used AI tools Grammarly and ChatGPT in order to review and optimize for grammar and readability. After using these tools, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

Librarian Bente Østergaard provided help with literature search.

Conflicts of interest

None disclosed.

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