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MULTIDISCIPLINARY MANAGEMENT OF LIPEDEMA: EVIDENCE ON DIETARY, PHYSIOTHERAPEUTIC, PHARMACOLOGICAL, AND SURGICAL INTERVENTIONS

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ABSTRACT

Lipedema is a chronic, progressive adipose tissue disorder that predominantly affects women and is associated with pain, edema, impaired mobility, and reduced quality of life. Despite growing awareness of the condition, its management remains challenging due to its multifactorial pathophysiology and the limited availability of evidence-based treatment guidelines. The aim of this narrative review was to examine current therapeutic approaches to lipedema, with particular emphasis on conservative management strategies and surgical treatment.

A literature review was conducted using publications retrieved from major scientific databases, including studies, systematic reviews, meta-analyses, and clinical guidelines addressing dietary interventions, physiotherapy, pharmacological therapies, and liposuction in patients with lipedema. The available evidence was analyzed to evaluate the effectiveness of these treatment modalities and their role within a multidisciplinary management framework.

Current findings indicate that dietary interventions, particularly ketogenic and Mediterranean dietary patterns, may improve body composition, metabolic health, pain, and inflammatory status. Physiotherapy, including compression therapy, exercise and complete decongestive therapy, remains a cornerstone of conservative treatment and has been shown to reduce symptom burden and improve functional outcomes. Emerging pharmacological therapies, especially glucagon-like peptide-1 receptor agonists, demonstrate promising potential but currently lack sufficient evidence for routine clinical use. Among available interventions, liposuction appears to provide the most substantial and sustained improvements in symptoms, mobility, and quality of life.

In conclusion, effective lipedema management requires a multidisciplinary and individualized approach combining conservative and surgical strategies. Further high-quality randomized controlled trials are needed to establish evidence-based treatment recommendations and optimize long-term patient outcomes.

KEYWORDS

Lipedema, Conservative Treatment, Physiotherapy, Ketogenic Diet, Liposuction, Quality of Life

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Introduction

Lipedema is a chronic, progressive adipose tissue disorder that predominantly affects women and is characterized by a disproportionate accumulation of subcutaneous fat, most commonly in the lower extremities and, less frequently, in the upper limbs. The condition is associated with pain, tenderness, easy bruising, impaired mobility, and a significant reduction in quality of life. Despite increasing awareness among healthcare professionals, lipedema remains underdiagnosed and is frequently mistaken for obesity or lymphedema, often resulting in delayed diagnosis and treatment.

The exact etiology and pathophysiology of lipedema have not yet been fully elucidated. Current evidence suggests that genetic predisposition, hormonal factors, microvascular dysfunction, chronic inflammation, and connective tissue abnormalities may contribute to its development and progression. The disease commonly manifests or worsens during periods of hormonal change, including puberty, pregnancy, and menopause.

The impact of lipedema extends beyond physical symptoms. Patients often experience psychological distress, body image dissatisfaction, reduced self-esteem, social stigmatization, anxiety, and depression. Functional limitations associated with pain and reduced mobility may further impair daily functioning and participation in social and professional activities. Consequently, lipedema represents a multifaceted health condition requiring a comprehensive therapeutic approach.

Current management strategies include both conservative and surgical interventions. Conservative treatment typically involves compression therapy, physical activity, nutritional counseling, weight management, manual lymphatic drainage, and patient education, with the primary aim of reducing symptoms, preserving function, and improving quality of life. In recent years, liposuction has gained recognition as an

effective surgical option capable of reducing pathological adipose tissue and providing long-term symptom relief in appropriately selected patients. Nevertheless, lifestyle-related interventions remain a fundamental component of care before and after surgical treatment and are recommended at all stages of the disease.

Given the growing body of research on lipedema management, a comprehensive evaluation of available therapeutic approaches is warranted. Therefore, the aim of this narrative review is to examine current evidence regarding both conservative and surgical treatment strategies for lipedema, with particular emphasis on the role of lifestyle modification, physical activity, nutrition, and weight management within a multidisciplinary treatment framework.

Methodology

This study was conducted as a narrative review of the literature concerning current approaches to lipedema management. A comprehensive search of PubMed, Scopus, and Web of Science databases was performed to identify relevant publications published in English between 2015 and 2026. The search strategy included combinations of the following keywords: lipedema, lipoedema, conservative treatment, lifestyle intervention, physical activity, exercise, nutrition, diet, weight management, compression therapy, manual lymphatic drainage, liposuction, surgical treatment, and quality of life.

Original research articles, systematic reviews, meta-analyses, clinical guidelines, consensus statements, and expert recommendations addressing the management of lipedema were considered eligible for inclusion. Publications focused exclusively on unrelated adipose tissue disorders or lacking relevance to therapeutic management were excluded. The selected literature was critically analyzed and synthesized to provide an overview of current evidence regarding conservative and surgical treatment modalities, as well as the role of lifestyle-related interventions in improving symptoms, functional outcomes, and quality of life among patients with lipedema.

Conservative Management of Lipedema

Conservative management constitutes the foundation of lipedema treatment and is recommended for all patients regardless of disease stage or eligibility for surgical intervention. Given the chronic and progressive nature of the condition, conservative therapies aim not to eliminate pathological adipose tissue but to alleviate symptoms, improve physical functioning, prevent disease progression, and enhance overall quality of life. Current clinical guidelines emphasize a multidisciplinary and individualized approach that addresses both the physical and psychosocial aspects of the disease.

The primary goals of conservative treatment include reducing pain and discomfort, minimizing edema and feelings of heaviness in the affected limbs, preserving mobility, and supporting long-term self-management. Furthermore, conservative interventions play an important role in addressing common comorbidities, including obesity, reduced physical activity, psychological distress, and impaired social functioning. Effective management therefore requires active patient participation and long-term adherence to therapeutic recommendations.

Several non-surgical strategies have been proposed for the management of lipedema, including compression therapy, manual lymphatic drainage, exercise, nutritional interventions, weight management, and psychological support. Although the level of scientific evidence varies among these approaches, current recommendations generally support their use as part of a comprehensive treatment plan tailored to individual patient needs. In addition, conservative treatment is frequently recommended both before and after liposuction to optimize outcomes and maintain long-term therapeutic benefits.

Recent years have witnessed growing interest in lifestyle-related interventions as an integral component of lipedema management. Physical activity, dietary modifications, and behavioral strategies have been increasingly investigated for their potential to improve symptom burden, functional capacity, and health-related quality of life. The following sections summarize current evidence regarding the most commonly applied conservative treatment modalities and their role in the multidisciplinary management of lipedema.

Dietary Interventions in Lipedema: Ketogenic and Mediterranean Diets

Nutritional management is considered an important component of conservative lipedema treatment, particularly in patients with overweight or obesity, which may exacerbate disease symptoms and progression. Among various dietary approaches, the ketogenic diet and the Mediterranean diet have received increasing attention as potential therapeutic strategies for individuals with lipedema. Both dietary patterns aim to improve

body composition and metabolic health, although they differ substantially in their nutritional composition and underlying mechanisms of action.

The ketogenic diet is characterized by a very low carbohydrate intake, moderate protein consumption, and high fat intake, inducing a metabolic state of ketosis in which ketone bodies become the primary source of energy. Beyond its effects on weight reduction, the ketogenic diet has been associated with anti-inflammatory properties, improved insulin sensitivity, and modulation of oxidative stress, all of which may be relevant to the pathophysiology of lipedema.

Recent evidence suggests that ketogenic dietary interventions may contribute to improvements in several clinical outcomes among patients with lipedema. In a comprehensive review, Verde et al. (2023) highlighted the potential mechanisms through which ketogenic diets may influence disease symptoms, including reductions in systemic inflammation, improvements in metabolic health, and decreases in pain perception. The authors emphasized that although current evidence remains limited, ketogenic dietary strategies appear promising as an adjunctive component of multidisciplinary lipedema management.

Clinical studies have also reported encouraging results. Cannataro et al. (2021) evaluated the long-term effects of a ketogenic diet in a patient with lipedema over a 22-month follow-up period. The intervention was associated with significant reduction in body weight, body fat percentage, and circumferences of affected limbs. Furthermore, the subject reported improvements in overall quality of life, suggesting that sustained nutritional intervention may contribute to symptom management and functional improvement. A reduction in C-reactive protein (although it was not elevated from the beginning) and basal insulin levels was observed following the intervention, which may support the anti-inflammatory effects of the ketogenic diet and its potential role in improving metabolic dysfunction associated with lipedema.

More recently, a systematic review and meta-analysis conducted by Amato et al. (2024) provided a broader synthesis of the available evidence regarding ketogenic diets as a nutritional intervention for lipedema. The analysis demonstrated that ketogenic dietary approaches were associated with significant reductions in body weight, body mass index, body fat percentage, waist and hip circumferences, and pain intensity. Improvements in quality of life and inflammatory status were also reported across several included studies. The authors concluded that ketogenic diets may represent a promising therapeutic option for lipedema management, particularly due to their combined effects on weight reduction and symptom relief. However, they also emphasized the limited number of available studies, methodological heterogeneity, and the need for larger, well-designed randomized controlled trials to strengthen current recommendations.

In addition to ketogenic approaches, the Mediterranean diet has emerged as another promising nutritional strategy for lipedema management. The Mediterranean diet is characterized by a high intake of vegetables, fruits, legumes, whole grains, nuts, olive oil, and fish, with limited consumption of processed foods and saturated fats. This dietary pattern is well known for its anti-inflammatory and cardiometabolic benefits. Di Renzo et al. (2021) investigated the effects of a modified Mediterranean diet specifically designed for women with lipedema. The intervention resulted in significant improvements in body composition, including reductions in fat mass and body weight, while preserving lean body mass. Participants also demonstrated favorable changes in anthropometric measurements and metabolic parameters. The authors suggested that the anti-inflammatory properties of the Mediterranean diet, combined with its ability to promote sustainable weight management, may contribute to symptom improvement and better disease control in patients with lipedema.

Di Renzo et al. (2023) investigated the effects of a modified Mediterranean ketogenic diet combined with carboxytherapy in women with lipedema. The authors observed that this diet induced weight and fat mass loss including the limbs, which are areas that are considered to be unresponsive to dietary interventions. Nevertheless, the most pronounced therapeutic benefits were observed when the modified Mediterranean ketogenic diet was combined with carboxytherapy. Their findings support the hypothesis that personalized nutritional strategies may enhance the effectiveness of conservative treatment, particularly when integrated with other therapeutic modalities. Despite these promising outcomes, further large-scale studies are required to confirm the long-term clinical effectiveness of this intervention.

Overall, current evidence suggests that both ketogenic and Mediterranean dietary approaches may provide meaningful benefits for patients with lipedema. Ketogenic diets appear particularly effective in promoting weight loss and reducing pain and inflammation, whereas Mediterranean dietary patterns may offer a more sustainable long-term strategy focused on improving body composition, metabolic health, and inflammatory status. Importantly, it remains unclear whether the observed benefits result primarily from specific dietary mechanisms, overall improvements in dietary quality, weight reduction, or a combination of these factors. Therefore, nutritional interventions should be individualized according to patient preferences, metabolic characteristics, and treatment goals, while further high-quality research is needed to establish the optimal dietary approach for lipedema management.

Physiotherapy in Lipedema Management

Physiotherapy represents a fundamental component of conservative lipedema management and aims to reduce symptoms, improve physical function, enhance lymphatic and venous circulation, and maintain quality of life. Given the chronic and multifactorial nature of lipedema, physiotherapeutic interventions are often incorporated into a comprehensive treatment plan that includes compression therapy, exercise, manual techniques, patient education, and other supportive modalities. Although physiotherapy cannot eliminate pathological adipose tissue, growing evidence suggests that it may significantly reduce pain, edema, limb volume, and functional limitations associated with the disease.

One of the most commonly recommended physiotherapeutic approaches is Complex Decongestive Physiotherapy (CDP), also referred to as Complete Decongestive Therapy (CDT). This multimodal intervention combines manual lymphatic drainage, compression therapy, therapeutic exercise, skin care, and patient education. The rationale behind CDP is to enhance lymphatic drainage, improve tissue mobility, reduce fluid accumulation, and promote long-term self-management. Clinical studies conducted by Volkan-Yazıcı and colleagues demonstrated that CDP significantly reduced limb circumference and volume in both upper and lower extremity lipedema, supporting its role as an effective conservative treatment option. Similarly, Atan and Bahar-Özdemir (2021) reported that complete decongestive therapy resulted in greater improvements in symptom severity and limb measurements compared with exercise alone in patients with severe lipedema.

Compression-based interventions remain a central element of physiotherapeutic management. Traditional compression garments have been associated with reductions in pain, heaviness, and functional impairment, while newer technologies appear to offer additional benefits. Wright et al. (2023) demonstrated that the use of a pneumatic compression device combined with compression stockings significantly improved symptoms and quality of life among women with lipedema. More recently, Herbst et al. (2025) reported that advanced pneumatic compression therapy reduced leg volume, extracellular fluid accumulation, adipose tissue thickness, and symptom burden while improving quality of life and potentially lowering the risk of secondary lymphedema. Likewise, Ricolfi et al. (2024) observed positive clinical outcomes when micromassage compression leggings were combined with physical exercise, suggesting a synergistic effect between compression and movement-based therapies. Further evidence from Czerwińska et al. (2024) indicated that compression therapy combined with exercise produced superior outcomes compared with exercise alone, highlighting the importance of multimodal interventions.

Exercise therapy has also emerged as a key component of physiotherapeutic management. Regular physical activity may improve mobility, muscle strength, exercise tolerance, lymphatic function, and overall well-being while reducing pain and edema. Recent systematic reviews have highlighted the potential benefits of structured exercise programs for patients with lipedema and related lymphatic disorders. Lanzi et al. (2025) concluded that exercise interventions appear safe and beneficial for women with lipedema, particularly with regard to functional capacity and symptom management. Similarly, Sakizli Erdal et al. (2026) demonstrated that a multimodal exercise program improved edema, pain, muscle strength, exercise capacity, and lower-limb function.

In addition to conventional approaches, several emerging physiotherapeutic modalities have shown promising results. Schneider (2020) reported that the addition of low-frequency vibrotherapy significantly enhanced the effectiveness of manual lymphatic drainage in reducing lipedema-related symptoms. A pilot study by Michelini et al. (2023) suggested that radial and defocused shock wave therapy, mesotherapy, and kinesio taping may provide additional symptom relief and functional benefits when incorporated into conservative treatment programs. More recently, Uzun et al. (2025) demonstrated that transfer energy capacitive and resistive (TECAR) therapy significantly improved clinical outcomes in women with stage II lipedema, indicating its potential as an adjunctive treatment modality.

Overall, current evidence supports the use of physiotherapy as an essential component of multidisciplinary lipedema management. While individual interventions such as compression therapy, manual lymphatic drainage, or exercise may provide meaningful benefits, the most favorable outcomes appear to be achieved through multimodal treatment strategies. Approaches combining compression, therapeutic exercise, manual therapies, and patient education consistently demonstrate greater improvements in pain, edema, limb volume, physical function, and quality of life than single interventions alone. Consequently, individualized physiotherapy programs integrating multiple evidence-based modalities should be considered the preferred conservative treatment approach for patients with lipedema.

Emerging Pharmacological Therapies for Lipedema

Currently, there is no pharmacological treatment specifically approved for lipedema. Consequently, lipedema management remains focused on lifestyle modification, physiotherapy, compression therapy, and, in selected cases, surgical intervention. However, increasing knowledge of the pathophysiological mechanisms underlying lipedema, including chronic inflammation, adipose tissue dysfunction, fibrosis, microvascular alterations, and metabolic disturbances has stimulated interest in the development of targeted pharmacological therapies.

Among the most promising candidates are glucagon-like peptide-1 receptor agonists (GLP-1 RAs), a class of medications widely used in the treatment of obesity and type 2 diabetes. Recent evidence suggests that the potential benefits of these agents may extend beyond weight reduction. Mohseni et al. (2026) proposed that GLP-1 receptor agonists could influence several key mechanisms involved in lipedema pathogenesis, including chronic inflammation, tissue fibrosis, and adipose tissue remodeling. By modulating inflammatory pathways and reducing fibrotic changes, these medications may potentially act as disease-modifying agents rather than solely promoting weight loss.

Similar conclusions were presented by Viana et al. (2025), who reviewed the potential role of tirzepatide, a dual glucose-dependent insulinotropic polypeptide (GIP) and GLP-1 receptor agonist, in lipedema management. The authors highlighted its potential to address multiple pathophysiological pathways simultaneously, including obesity-related metabolic dysfunction, inflammation, and fibrosis. Although clinical evidence in lipedema remains limited, tirzepatide has been proposed as a particularly attractive therapeutic option due to its substantial effects on body weight reduction and metabolic health.

Preliminary clinical observations have also emerged regarding exenatide, another GLP-1 receptor agonist. In a case series involving Italian patients with lipedema, Patton et al. (2025) reported improvements in body weight, symptom severity, and patient-reported outcomes following pharmacological treatment with exenatide. While these findings are encouraging, the authors emphasized the exploratory nature of the data and the need for larger controlled studies to confirm efficacy and safety.

Beyond incretin-based therapies, other pharmacological approaches have been explored. Bonetti et al. (2023) proposed sodium cromoglycate as a potential treatment option based on emerging evidence implicating mast cell activation in the pathogenesis of lipedema. Since mast cells may contribute to inflammation, fibrosis, and tissue remodeling, pharmacological stabilization of these cells could theoretically reduce disease progression and symptom burden. However, evidence supporting this approach remains largely preclinical and hypothesis-generating.

Natural compounds with anti-inflammatory and vascular-protective properties have also attracted attention. In a randomized controlled trial, Mello Netto et al. (2025) investigated the effects of Pycnogenol®, a standardized extract from French maritime pine bark. The intervention was associated with improvements in several clinical parameters, suggesting potential benefits related to microcirculation, edema reduction, and symptom management. Nevertheless, additional studies are required to determine its long-term therapeutic value and clinical applicability.

In contrast, not all proposed pharmacological treatments have demonstrated scientific support. A systematic review conducted by Amato et al. (2025) found insufficient evidence to support the use of gestrinone in the treatment of lipedema. The authors concluded that current recommendations for this hormonal therapy are not supported by robust clinical data and emphasized the need for evidence-based evaluation before its routine use can be considered.

Overall, pharmacological treatment of lipedema remains an emerging field characterized by promising but still preliminary evidence. Among currently investigated options, GLP-1 receptor agonists and dual incretin therapies appear particularly promising due to their potential effects on both metabolic and inflammatory pathways involved in disease progression. However, the available evidence is largely based on narrative reviews, case series, and early clinical studies. Therefore, well-designed randomized controlled trials are necessary before any pharmacological therapy can be routinely recommended as part of standard lipedema management.

Surgical Treatment of Lipedema

While conservative management remains the first-line treatment for lipedema, surgical intervention has emerged as an important therapeutic option for patients who continue to experience significant symptoms despite comprehensive non-surgical treatment. Liposuction is currently the only intervention capable of directly removing pathological lipedema adipose tissue and is increasingly recognized as an effective strategy for long-term symptom reduction and functional improvement. Contemporary surgical approaches aim not only to reduce limb volume but also to alleviate pain, improve mobility, enhance quality of life, and decrease dependence on conservative therapies.

The growing role of surgery in lipedema management is reflected in the ongoing LIPLEG trial, a multicenter randomized controlled study designed to compare the efficacy and safety of liposuction with complex physical decongestive therapy (Podda et al., 2021). The study was developed in response to increasing evidence suggesting that surgical treatment may provide benefits beyond those achievable with conservative management alone. Although conservative therapies remain essential components of care, the trial highlights the evolving perception of liposuction as a potentially disease-modifying intervention rather than solely a cosmetic procedure.

A substantial body of observational evidence supports the effectiveness of liposuction in reducing symptom burden. Wright et al. (2023) reported significant improvements in pain, mobility, physical function, and quality of life following lipedema reduction surgery. Similarly, Kirstein et al. (2023) demonstrated favorable patient-reported outcomes after liposuction, with participants reporting improvements in physical symptoms, daily functioning, and overall satisfaction with treatment. These findings suggest that surgical intervention may have a meaningful impact on both physical and psychosocial aspects of the disease.

Further evidence regarding quality of life outcomes was provided by Klöppel et al. (2024), who conducted a prospective study evaluating patients after liposuction for lipedema. The authors observed significant improvements across multiple domains of health-related quality of life, including physical functioning, pain perception, and emotional well-being. These results reinforce previous observations that the benefits of surgery extend beyond simple volume reduction and may contribute substantially to overall patient well-being.

Long-term outcome data have also been encouraging. In a retrospective study, Schwartz et al. (2026) reported sustained improvements in symptoms and functional status following lipedema reduction surgery. Additionally, the authors noted improvements in several obesity-related and musculoskeletal comorbidities such as difficulties with mobility and balance, suggesting that surgical treatment may positively influence broader health outcomes. Such findings support the hypothesis that reducing pathological adipose tissue may interrupt some of the mechanisms contributing to disease progression and disability.

Recent evidence syntheses further strengthen the case for surgical intervention. A systematic review by Vengoechea et al. (2026) concluded that modern liposuction techniques are generally safe and effective for appropriately selected patients with lipedema. Across the included studies, consistent improvements were observed in pain, limb volume, mobility, and quality of life, while serious complications were relatively uncommon. Similarly, a systematic review and meta-analysis by Coutinho et al. (2026) demonstrated significant benefits of surgical treatment in patients with refractory lipedema, confirming substantial reductions in symptom severity and improvements in patient-reported outcomes.

Given the increasing number of available surgical approaches, attention has also focused on determining the most effective liposuction techniques. Fijany et al. (2024) compared different surgical methods and found that contemporary techniques, including tumescent liposuction (TTL), water-assisted liposuction (WAL), and power-assisted liposuction (PAL), generally demonstrate favorable safety profiles and clinical effectiveness. Although differences between techniques remain an area of ongoing investigation, current evidence suggests that all three approaches can achieve meaningful reductions in symptom burden when performed by experienced surgeons.

Despite these encouraging results, surgical treatment should not be viewed as a standalone solution. Most experts emphasize that optimal outcomes are achieved when liposuction is integrated into a comprehensive treatment strategy that includes ongoing lifestyle modification, physiotherapy, compression therapy, and long-term follow-up. Conservative measures often remain necessary before surgery to optimize patient condition and after surgery to maintain functional gains and prevent symptom recurrence.

Overall, current evidence indicates that liposuction represents the most effective intervention currently available for reducing pathological lipedema tissue and improving long-term clinical outcomes. While conservative treatment remains essential for all patients, surgical intervention may provide substantial additional benefits in appropriately selected individuals, particularly those with persistent symptoms, functional limitations, or inadequate response to non-surgical therapies. Future randomized controlled trials are expected to further clarify the role of surgery within multidisciplinary lipedema management.

Discussion

The present review highlights the multifactorial nature of lipedema and emphasizes the need for a comprehensive, multidisciplinary treatment approach. Current evidence suggests that no single intervention is sufficient to address all aspects of the disease. Instead, optimal management appears to require the integration of lifestyle modification, physiotherapy, compression therapy, psychological support, and, when indicated, surgical treatment.

Among conservative strategies, nutritional interventions have emerged as particularly promising. Both ketogenic and Mediterranean dietary approaches were associated with improvements in body composition, symptom severity, and quality of life. The observed benefits may be partly explained by weight reduction and improvements in metabolic health; however, the anti-inflammatory properties of these dietary patterns may also play a significant role. Nevertheless, the available evidence is characterized by small sample sizes and methodological heterogeneity, making it difficult to determine the superiority of one dietary approach over another. Future studies should therefore focus on identifying the most effective nutritional strategies and clarifying the mechanisms responsible for symptom improvement.

Physiotherapy remains another essential component of conservative management. The reviewed studies consistently demonstrated positive effects of compression therapy, exercise programs, and complete decongestive therapy on pain, edema, limb volume, and physical functioning. Importantly, the greatest benefits were generally observed when multiple therapeutic modalities were combined rather than applied individually. These findings support the concept of multimodal rehabilitation as the cornerstone of conservative lipedema treatment and highlight the importance of individualized treatment planning.

Recent advances in pharmacological research have opened new perspectives for lipedema management. In particular, GLP-1 receptor agonists and dual incretin therapies have attracted growing interest because of their potential to influence both metabolic dysfunction and inflammatory processes involved in disease pathogenesis. However, current evidence is largely limited to narrative reviews, mechanistic studies, and small clinical investigations. Consequently, pharmacological treatment cannot yet be considered part of standard lipedema care, although ongoing research may substantially change future therapeutic recommendations.

The strongest evidence for substantial and long-lasting symptom improvement currently appears to support surgical intervention. Liposuction has consistently been associated with reductions in pain, improvements in mobility and physical function, and enhanced quality of life. Importantly, recent studies suggest that surgery may provide benefits extending beyond cosmetic improvement, potentially modifying disease progression and reducing disability. Nevertheless, surgical treatment should not replace conservative management but rather complement it within a long-term treatment strategy. Appropriate patient selection, preoperative preparation, and postoperative rehabilitation remain critical for achieving optimal outcomes.

Several limitations within the current body of evidence should also be acknowledged. Many available studies involve relatively small patient populations, observational designs, or short follow-up periods. Furthermore, differences in diagnostic criteria, outcome measures, and treatment protocols make direct comparisons between studies challenging. The lack of large randomized controlled trials remains a significant obstacle to the development of evidence-based clinical guidelines. Therefore, further high-quality research is necessary to establish standardized treatment algorithms and optimize long-term patient outcomes.

Conclusions

Lipedema is a chronic and progressive disorder that significantly affects physical health, functional capacity, and quality of life. The findings of this review indicate that effective management requires a multidisciplinary approach that addresses both the physical manifestations of the disease and its broader psychosocial consequences.

Current evidence supports the use of conservative treatment as the foundation of lipedema management. Dietary interventions, particularly ketogenic and Mediterranean dietary patterns, may contribute to improvements in body composition, metabolic health, and symptom burden. Physiotherapy, including compression therapy, exercise, manual lymphatic drainage, and complete decongestive therapy, plays a central role in reducing pain, edema, and functional limitations. Emerging pharmacological therapies, especially GLP-1 receptor agonists and related agents, represent promising avenues for future treatment but currently lack sufficient evidence for routine clinical implementation.

Among available therapeutic options, liposuction appears to be the most effective intervention for reducing pathological adipose tissue and achieving long-term improvements in symptoms, mobility, and quality of life.

However, surgical treatment should be considered part of a comprehensive treatment plan rather than a standalone solution, with continued emphasis on lifestyle modification and postoperative conservative care.

Future research should prioritize large-scale randomized controlled trials evaluating both conservative and surgical interventions. Particular attention should be given to the long-term effectiveness of dietary strategies, multimodal physiotherapy programs, and emerging pharmacological therapies. Additionally, studies investigating patient-centered outcomes, quality of life, and disease progression are needed to improve clinical decision-making and support the development of evidence-based treatment guidelines. A better understanding of the underlying pathophysiological mechanisms of lipedema may ultimately facilitate the development of targeted therapies capable of modifying disease progression and improving long-term outcomes for affected individuals.

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