



## Surgical Management of Advanced Lipedema: Experience from Mohammed VI University Hospital Center and Comparison with Current Guidelines

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### Article History

Received: 27-11-2025

Accepted: 24-01-2026

Published: 30-01-2026



### Abstract:

**Background:** Lipedema and advanced lymphedema are chronic disorders of adipose and lymphatic tissues that remain frequently underdiagnosed. Their coexistence poses therapeutic challenges, particularly when conservative management fails. Although international guidelines support surgical intervention in selected cases, real-world data from resource-limited hospital settings remain scarce. **Objective:** To report the experience of a Moroccan tertiary university hospital in the surgical management of advanced lipedema and lymphedema and to compare clinical outcomes with current international recommendations.

**Methods:** A retrospective descriptive case series was conducted between 2021 and 2024. Three patients underwent surgical treatment using tumescent liposuction or en bloc tissue resection with skin grafting. Postoperative outcomes were assessed clinically and through a structured quality-of-life questionnaire inspired by the SF-36, focusing on pain, mobility, and overall satisfaction. **Results:** All procedures were completed without intraoperative or postoperative complications. The volume of aspirated adipose tissue ranged from 2.1 to 4.0 L. One patient with advanced secondary lymphedema required surgical resection, with evacuation of 1.2 L of lymphorrhea. Postoperative satisfaction ranged from moderate to high, with reported quality-of-life scores between 5 and 8 out of 10. These findings are consistent with outcomes reported in recent international series. **Conclusion:** Surgical treatment of advanced lipedema and lymphedema is feasible, safe, and clinically beneficial, even in resource-limited settings. An individualized, guideline-based approach allows satisfactory functional and quality-of-life outcomes. Further prospective studies with standardized assessment tools are required.

**Keywords:** Lipedema, Lymphedema, Tumescent liposuction, Reconstructive surgery, Quality of life, Adipose tissue disorders.

### Review Article

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### 1. INTRODUCTION

Lipedema is a chronic, progressive disorder characterized by symmetrical and painful hypertrophy of subcutaneous adipose tissue, predominantly affecting women. The disease typically involves the lower extremities while sparing the feet and is

often associated with tenderness, easy bruising, and functional impairment. Despite its clinical specificity, lipedema remains largely underdiagnosed and frequently confused with obesity or lymphedema due to limited awareness and the lack of standardized diagnostic criteria [2, 9].

**Citation:** Dr. Othmane Oudrhiri *et al.*, (2026 January). Surgical Management of Advanced Lipedema: Experience from Mohammed VI University Hospital Center and Comparison with Current Guidelines. *ISR J Surg*, 2(1), 03-06

Lymphedema, by contrast, results from impaired lymphatic drainage leading to accumulation of protein-rich interstitial fluid. It may be primary or secondary, most commonly following oncologic surgery, radiotherapy, infection, or trauma [2]. In advanced stages, overlap between lipedema and lymphedema is common, resulting in mixed clinical presentations that complicate both diagnosis and management [12].

Conservative management—including complex decongestive therapy, manual lymphatic drainage, and compression garments—remains the first-line treatment [6, 11]. However, in advanced or refractory cases, surgical intervention becomes necessary. Tumescent liposuction (TLA), vibration-assisted (PAL) and water-assisted liposuction (WAL), as well as selective tissue resection in severe fibrotic forms, have demonstrated functional and symptomatic benefits [3-5, 8].

Recent international guidelines, such as the German S2k guideline (2024) and the U.S. Delphi consensus (2021), provide a structured framework for surgical indications and technique selection [9, 10]. Nevertheless, data describing the application of these recommendations in low- and middle-income countries remain limited.

The aim of this study is to describe the experience of a Moroccan university hospital in the surgical management of advanced lipedema and lymphedema and to compare clinical outcomes with current international standards.

## 2. Materials and Methods

### 2.1 Study Design

This retrospective descriptive study was conducted in the Department of Reconstructive and Aesthetic Surgery at Mohammed VI University Hospital, Marrakech, between January 2021 and December 2024.

### 2.2 Inclusion Criteria

Patients were included if they presented with:

- Clinically confirmed lipedema (symmetry, pain, sparing of the feet, non-pitting edema), or
- Advanced secondary lymphedema resistant to conservative treatment,
- Surgical treatment performed (tumescent liposuction or cutaneous resection),
- Minimum postoperative follow-up of one month,
- Available subjective quality-of-life evaluation.

### 2.3 Data Collection

Collected variables included demographic data, pathology type, surgical technique, aspirated or resected volume, postoperative management, complications, and patient-reported outcomes related to pain, function, aesthetics, and overall satisfaction.

### 2.4 Literature Comparison

Clinical outcomes were qualitatively compared with international guidelines and cohort studies indexed in PubMed and major databases, including meta-analyses and scoping reviews on lipedema surgery [3, 8]. No statistical analysis was performed due to the limited sample size.

## 3. RESULTS

Three female patients aged 28–45 years were included. Two patients presented with lipedema (primary or mixed form), and one patient had advanced secondary lymphedema of the elephantiasis type following oncologic treatment.

Tumescent liposuction was performed in two patients, with aspirated volumes of 2.1 L and 4.0 L, respectively. One patient with advanced fibrotic lymphedema underwent en bloc tissue resection with skin grafting, allowing evacuation of 1.2 L of lymphorrhea. No

intraoperative or postoperative complications were observed.

All patients received postoperative compression therapy and manual lymphatic drainage, in accordance with international recommendations [9, 10].

Subjective quality-of-life outcomes ranged from moderate to high. Patients reported reduced pain, improved mobility, and better tolerance of compression garments. Aesthetic improvement remained limited in the most advanced lymphedema case.

#### 4. DISCUSSION

This case series illustrates the feasibility and safety of surgical management of advanced lipedema and lymphedema in a resource-limited university hospital setting. The outcomes observed are consistent with international literature, particularly regarding the efficacy of tumescent liposuction in reducing pain and improving functional capacity [1, 3].

Kirstein *et al.*, reported significant improvement in patient-reported quality-of-life outcomes in over 80% of patients treated with liposuction combined with postoperative compression therapy [1]. Similarly, Amato *et al.*, demonstrated a mean volume reduction exceeding 30% with a low complication rate in their meta-analysis [3].

In advanced secondary lymphedema, surgical resection remains a salvage option when conservative therapy fails. While functional improvement can be achieved, aesthetic outcomes and overall quality-of-life gains may remain limited, particularly in fibrotic elephantiasis [2]. This observation is consistent with our findings.

Our surgical approach aligns with current international recommendations,

emphasizing individualized technique selection based on disease stage, fibrosis, and surgeon expertise [4, 5, 9]. Despite relatively large aspirated volumes, no complications were observed, supporting the safety of the adopted protocol in a low-resource context.

#### 5. Limitations

The main limitations of this study include the small sample size, retrospective design, short follow-up period, and reliance on non-validated subjective quality-of-life measures. Nevertheless, this work provides valuable insight into real-world practice in a setting that remains underrepresented in the literature.

#### 6. CONCLUSION

Surgical treatment of advanced lipedema and lymphedema is a valuable therapeutic option when conservative measures fail. Our experience demonstrates that guideline-based surgical management can be safely implemented in a Moroccan university hospital, with meaningful functional and quality-of-life benefits. Larger prospective studies using standardized outcome measures are required to confirm these findings and support broader implementation.

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