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# Fat reduction



## Complications and management

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### Learning objectives

After completing this learning activity, participants should be able to recognize, describe, and diagnose the complications arising from invasive, minimally and noninvasive fat removal procedures; and identify/ compare the latest most successful strategies to manage complications. The reader should also be able to describe technical insights and tips on specific fat removal strategies that maximize successful clinical outcome and minimize risk of complications.

### Disclosures

#### Editors

The editors involved with this CME activity and all content validation/peer reviewers of the journal-based CME activity have reported no relevant financial relationships with commercial interest(s).

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Despite the favorable safety profile of liposuction, complications occur that need to be appropriately managed. In the second article in this continuing medical education series, the range of complications that may arise from liposuction are described, and the latest best practices to manage them are discussed. Specific technical strategies to prevent and minimize the risk of complications are also presented. Early recognition, accurate diagnosis, and proper clinical management can ensure an optimal outcome and patient satisfaction in individuals who are investing in fat reduction procedures. (J Am Acad Dermatol 2018;79:197-205.)

**Key words:** complications; liposuction; local; management; prevention; systemic.

## EPIDEMIOLOGY OF COMPLICATIONS

### Key point

- **Epidemiology data on liposuction show that it is a safe procedure with rare serious side effects.**

Tumescent liposuction has proven to be incredibly safe. A study reporting 15,336 cases of tumescent liposuction performed by dermatologic surgeons found that there were no fatalities, serious complications, or the need for hospital admission because of a

complication. Four cases of toxic shock syndrome were recognized, while rates for infection (0.34-0.6%), skin irregularities (0.26-2.1%), hematoma/seroma (0.17-1.6%), scarring (0.02%), and sensory nerve impairment (0.03-2.6%) were low.<sup>1</sup> Similar results were shown in a study examining the safety of tumescent liposuction performed by dermatologic surgeons, where the overall rate of serious adverse effects was 0.068%. The complication rate was higher in the hospital versus the outpatient setting (0.1.1% vs

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**Table I.** Liposuction-related complications

Local	Systemic
Edema/ecchymosis	Blood loss
Seroma	Hypothermia
Hematoma	Visceral perforation
Asymmetry	Infection/toxic shock syndrome
Undercorrection	Fat embolism syndrome
Overcorrection	Deep vein thrombosis
Skin laxity	Pulmonary edema
Necrosis	
Hyperpigmentation	
Neurological	

0.04%).<sup>2</sup> The Accreditation Association for Ambulatory Health Care Institute for Quality Improvement reporting on 688 cases of tumescent liposuction from 39 organizations found no fatalities and a rate of complications of 0.14%.<sup>3</sup> Complications encountered by dermatologic surgeons performing fat reduction procedures in an office setting and the management of these complications are presented below.

### Diagnosis of complications

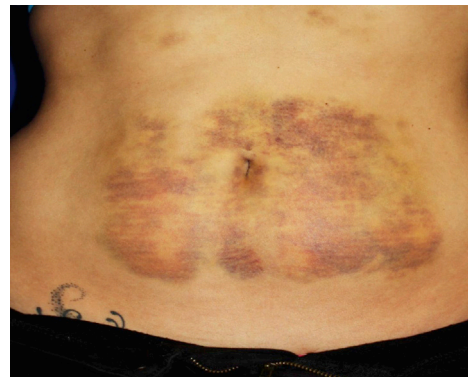
Early recognition of complications and subsequent treatment is essential to minimize sequelae. The surgeon must inform the patient of the complication, its probable or possible cause or causes, the proposed treatment, and the duration of time before complete recovery. When major complications occur, office-based practitioners need to refer patients to a hospital emergency department for comprehensive care.

## LIPOSUCTION-ASSOCIATED COMPLICATIONS, MANAGEMENT, AND TECHNICAL CONSIDERATIONS FOR THEIR PREVENTION

### Key points

- Liposuction-associated complications are local or systemic
- Complications during liposuction can be treated with antibiotics, additional corrective surgeries, or referral to specialized medical services
- Rigorous preoperative consultation and adherence to liposuction best practices can help prevent complications

Liposuction-associated complications can be broadly categorized as either local or systemic. Although not a complication per se, patient



**Fig 1.** Extensive bruising after high-intensity ultrasound.

dissatisfaction is also a category of unfavorable treatment outcome (Table I).

### Local complications

**Prolonged edema and ecchymosis.** Swelling or edema is anticipated after liposuction as a normal reaction of the tissue to surgical trauma. It usually lasts 4 to 6 weeks postprocedure, although minor swelling can take  $\leq 6$  months to subside. In normal circumstances, swelling peaks 2 weeks postprocedure, followed by a period of 10 to 14 days where the texture becomes firmer. As the infiltrate, fatty acids, and serum are reabsorbed, tissue resumes its normal pliant feel.

In rare instances, edema accompanied with pain may persist beyond 6 weeks. This is hypothesized to be caused by excessive tissue trauma, leading to an internal burn-like injury.<sup>4</sup> The prolonged edema may also result in increased scarring, fibrosis, and surface irregularities. Factors contributing to this phenomenon include the location of liposuction, the patient's genetic makeup, and fatty-tissue type. Edema may manifest in patients with anemia, reduced serum proteins, and kidney malfunction.

Ecchymosis also occurs postliposuction, peaks at 7 days, and wanes by 4 weeks. Excessive and severe ecchymosis may be patient-related (tobacco use, medications), or procedure-related (trauma to the venous system during liposuction) (Fig 1).

Strategies that can minimize persistent edema and expedite resolution include the postsurgical application of compressive garments, ice packs, and manual lymphatic drainage. Some authors believe that power-assisted liposuction reduces tissue trauma and therefore the risk for prolonged edema/ecchymosis.<sup>5</sup> Preventative measures include using a gentle technique during liposuction and ensuring patient adherence to preoperative instructions.<sup>4</sup>

**Seromas.** The accumulation of serous fluid in a liposuctioned area may be caused by trauma after

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