



Current Standards of Liposuction Surgery and the Effect of Tumescent Anesthesia on Patient Recovery

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Introduction

One of the most popular cosmetic surgery procedures, liposuction and its techniques have evolved rapidly since its development in the 1970s. Not only with aesthetic but also systemic advantages, liposuction surgery, its safety profile and operative efficiency techniques have progressed to aid both surgeon and patient in gaining the best result. We review the current standards for liposuction surgery and further examine the use of tumescent anesthesia; its composition, best safety practices, and its effect on post-procedure patient recovery.

Current Liposuction Standards (as adapted from the 2009 Guidelines for Liposuction Surgery, American Academy of Cosmetic Surgery [AACS]).

Training

Physicians practicing liposuction surgery should have adequate training and experience in the field. This training and experience may be obtained in residency training, cosmetic surgery fellowship training, observational training programs, CME accredited post-graduate didactic and live surgical programs, or via proctorship with trained credentialed surgeons experienced in liposuction techniques.

Preoperative Evaluation

A documented medical history, physical examination, and appropriate laboratory work based upon the patient's general health and age must be performed on all patient candidates. Special attention should be given to bleeding disorders, potential drug interactions, history of thrombophlebitis, and other common risks of surgery. Thorough clinical examination should include a detailed evaluation of the regions to be lipocontoured including a notation of hernias, scars, asymmetries, cellulite, and stretch marks. The underlying abdominal musculofascial system should be evaluated for the presence of laxity, integrity, and diastasis recti.

Indication

Indications for liposuction techniques include removal of localized deposits of adipose tissues that do not respond to diet and exercise.

Tumescent

Infiltration of large volumes of dilute local anesthetic (i.e., lidocaine [0.5 gm/L - 1.0 gm/L] with epinephrine [1.0 mg/L])

has been shown clinically to significantly decrease blood and intravascular fluid loss; it is also believed to facilitate lip contouring. When using the tumescent technique and other forms of infiltration of lidocaine with epinephrine, studies recommend a maximum range of 45-55 mg/kg.

Ultrasonic

Ultrasonic-assisted liposuction (UAL) is a recognized technique that appears to be safe, based on current reported clinical experiences. It is common to use ultrasonic-assisted liposuction in conjunction with conventional liposuction techniques (machine or syringe).

Laser light technologies/power assisted

Newer technologies continue to emerge to improve the efficacy and efficiency of liposculpting.

Megaliposuction

A single stage removal of more than 6,000 mL supernatant fat, the AACS recommends serial liposuction for the removal of large volumes of fat rather than utilizing megaliposuction secondary to higher rates of morbidity and mortality.

Recommended Volumes for Removal

Liposuction surgery, using the tumescent technique, has been demonstrated to be safe for the routine removal of volumes up to 5,000 mL (supernatant fat). Volumes exceeding 5,000 mL should be removed in select patients without comorbidities in an approved operating facility. Liposuction may be safely performed utilizing tumescent local anesthesia only, local plus IV sedation, epidural blocks, or general anesthesia on an outpatient basis.

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Surgical Setting

Liposuction surgery may be commonly performed on an ambulatory, outpatient basis in clinic-based surgical facilities, free-standing surgical facilities, or hospital settings. Additionally, the procedures must be performed with routine monitoring of vital signs, oxygen saturation, EKG monitoring, and end-tidal CO₂ monitoring (if under general anesthesia). IV access is recommended for removal of volumes greater than 100 mL of fat.

Expected Sequelae and Outcomes

Best results are expected in younger patients, minor deformities, normal body mass index, elastic skin, and small volume removal. Common side effects of liposuction surgery include edema, ecchymosis, dysesthesia, fatigue, soreness, scarring, asymmetry, and contour imperfections.

Postoperative Care

Post-surgical compression garments including binders, girdles, foam tape, closed-cell foam, and other specialized equipment have been effectively utilized. The use of compression is considered important and appears to be most helpful in the first seven days following surgery. Reasonable early ambulation of liposuction patients is advisable to avoid venous stasis and shorten the post-operative recuperation period.

Effects of Tumescent Anesthesia on Recovery

Tumescent fluid is used in a wide array of cosmetic procedures for its intraoperative vasoconstrictive effects. Procedures including, but not limited to, liposuction, abdominoplasties, facelifts, and rhinoplasties have techniques inclusive of tumescence [1]. The effect of intraoperative tumescence use, and its analgesia has allowed for decreased post operative pain, increased ambulation, and higher patient satisfaction scores [2]. As techniques evolve to accommodate large volume liposuction, lower levels of lidocaine has proven efficacious to reduce the chance of lidocaine toxicity without affecting surgical result [3]. However, adverse effects associated with large dosages of tumescent lidocaine with epinephrine are infrequent [4].

What's Trending: Brazilian Butt Lift [BBL] (as adapted from the 2020 BBL Guidelines, American Academy of Cosmetic Surgery).

Currently one of the most popular cosmetic procedures being performed, a BBL is an outpatient procedure done in a sterile surgical facility.

Technique

After thorough liposuction has been performed (up to 4 liters of supranatant fat) on the body, the patient is placed in the prone position with adequate exposure of the gluteal regions to be augmented. Typically, the transition area

between the lower back and upper gluteal region will attempt to be reduced in order to enhance the gluteal curvature. Larger cannulas are generally recommended (4 mm - 5 mm) to secure adequate healthy fat. The aspirate will contain tumescent fluid, blood, intact fat (supernatant fat) and ruptured fat. The goal of preparation is to isolate the supernatant fat to be injected. Standard centrifuge techniques can be used to separate the layers of aspirate. Approximately 4-6 liters of fat will be required for gluteal augmentation in most cases.

Injection of the harvested fat should be done with blunt tip cannulas (3 mm - 4 mm). Blunt tip cannulas reduce the likelihood of damage to vessels while injecting which dramatically reduces the chances of fat embolism. 10 cc - 60 cc syringes are commonly used for injection. Injection is performed in a fanning pattern along the gluteal surface from multiple angles to increase fat survival. Depth of injection is limited to the skin and subcutaneous fat to reduce risk of fat embolism. Recent guidelines from the Multi-Society Task Force for Safety in Gluteal Fat Grafting include ultrasound-guided documentation of cannula placement prior to and during gluteal fat injection as well as a limit of 3 BBL procedures per day [5].

Postoperative management

Patients should be wrapped post-operatively to prevent leakage of any harvested fat from incision. Post-operative instructions should advise patients to sleep and lay in the lateral decubitus positions to avoid pressure on the newly augmented gluteal region. Patients should be advised that results of the contouring will take 6 months to 1 year to be finalized.

Conclusion

As liposuction surgery continues to evolve in both safety and technique, it is imperative practitioners stay up to date with best practice standards. Even as new, trendy operations develop, providers should take heed to safety protocols to better serve patients for the best results.

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