

The Two Standards of Care for Tumescent Liposuction

Editorial¹

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There are two standards of care for tumescent liposuction: **true tumescent liposuction**, which is totally by local anesthesia, and **semi-tumescent liposuction**, which requires general anesthesia or heavy IV sedation. Both techniques can be done safely. However, there is a greater risk and a definite tendency for a surgeon to exceed the limits of safety when using semi-tumescent liposuction. There have been no deaths associated with true tumescent liposuction.

The tumescent technique was developed to minimize surgical risk and optimize patient comfort. When a surgeon intentionally modifies the tumescent technique and increases the risks of surgical complications, then the technique cannot accurately be termed the true tumescent technique or true tumescent liposuction.

When liposuction by general anesthesia (IV or inhalational), and a modified tumescent technique results in a patient's death from the effects of excessive volumes of fat removal, excessive IV fluids, hypothermia, or complications of general anesthesia such as anoxia, pulmonary embolus, or asystole, is it accurate to state that the death was associated with true tumescent liposuction?

Consider the following vignette. A group of specialists starts using a safe surgical technique not invented by them; then they modify the technique, making it more dangerous; then they experience serious complications and fatal outcomes; then they claim only they have the training and experience to perform such a dangerous procedure.

In order to assure the public that not all tumescence techniques are created equal, and to avoid confusion over terminology, the following definitions must be articulated. Because the tumescent technique for liposuction has evolved and greatly improved over the years, prior terminology is now antiquated and inaccurate. The following definitions are intended to provide some precision to one's tumescent vocabulary.

The **Tumescent Technique** is a pharmacologic method of drug delivery that produces widespread local, regional, or systemic effects by subcutaneous infiltration of very dilute solutions of the drug in physiologic saline or a similar solution. Any type of

drug that can be injected subcutaneously is a potential candidate for delivery by the tumescent technique.

Tumescent Hemostasis is achieved using the tumescent technique to produce widespread, profound, and prolonged vasoconstriction in subcutaneous fat by the infiltration of very dilute epinephrine, for example 1:1,000,000 (that is 1 g epinephrine per 1,000,000 mL of normal saline or Ringer's lactate, which is equivalent to 1 mg/1,000 mL).

Tumescent Anesthesia is a technique for local anesthesia. It uses large volumes of dilute lidocaine and dilute epinephrine to permit liposuction totally by local anesthesia without general anesthesia, or IV sedation, and with virtually no significant blood loss. The actual formulation of the tumescent anesthetic solution varies as a function of clinical requirements. Typically the concentration of lidocaine varies between 50 and 1,500 mg/L, while epinephrine may vary between 0.5 and 1.5 mg/L.

True Tumescent Liposuction is a very specific method of doing liposuction totally and exclusively by local anesthesia. Tumescent liposuction incorporates tumescent anesthesia (dilute lidocaine and epinephrine) with the use of micro-cannulas, and small incisions that are not closed with sutures. Incisions that are not closed with sutures promote copious postoperative drainage, which in turn reduces systemic lidocaine absorption and dramatically reduces postoperative inflammation as well as bruising, soreness, tenderness, and swelling. To the best of my knowledge there have been no deaths associated with tumescent liposuction totally by local anesthesia without parenteral narcotic analgesia or general anesthesia.

Semi-Tumescent Liposuction, or semi-tumescent technique, is the liposuction by general anesthesia (IV or inhalational) or heavy IV sedation. It is a *forme fruste*, or an incomplete version of tumescent liposuction. Semi-tumescent liposuction implies that the tumescent technique is only used for its ability to produce profound hemostasis, and postoperative anesthesia. Semi-tumescent liposuction has increased risks including the toxicity and dangerous side effects of general anesthesia. Semi-tumescent liposuction ignores the improved safety provided by local anesthesia compared with the risks associated with general anesthesia. Every death reported in association with liposuction has also been associated with general anesthesia, heavy IV sedation, or bupivacaine.

Meretricious¹-Tumescent Liposuction is identical to the outmoded wet technique, with the exception that the patient has been falsely promised that the tumescent technique will be used. Unfortunately such deception is not uncommon. Having been educated by the media, most prospective patients demand the safety of the tumescent technique. It is meretricious to promise the tumescent technique if the surgeon has never performed or does not intend to perform liposuction totally by local anesthesia.

Licentious²-Tumescent Liposuction is dangerous liposuction associated with any one of the following: liposuction of an excessive volume of fat, excessive number of areas treated, excessive IV fluids infused, excessive blood loss, excessive quantities of local anesthetics, and the complications of general anesthesia. Licentious liposuction is dangerous liposuction that goes far beyond the limits of safety as defined by the empiric rules of normal human physiology.

Before the tumescent technique, the safe maximum volume of liposuction was limited by surgical blood loss. With the advent of tumescent vasoconstriction, safety limits for liposuction still exist, but they are now less obvious. Tumescent hemostasis seduces surgeons into a false sense of security. With liposuction totally by local anesthesia, an alert comfortable patient can communicate, and warn the surgeon about the onset of symptoms of excessive surgery such as hypovolemia, hypotension, or pulmonary congestion. However, with tumescent hemostasis, surgeons see no blood loss, and with general anesthesia or heavy IV sedation they are more likely to miss early signs of impending shock. In this sense, general anesthesia predisposes to excessive liposuction and requires extra caution.

Licentious liposuction occurs most frequently in associated with general anesthesia because Brobdingnagian volumes of fat are liposuctioned more easily with general anesthesia. Consequently, the risk of an iatrogenic death is significantly greater with liposuction by general anesthesia or heavy IV sedation.

¹ Meretricious (f. *meretri c-*, *meretrix* harlot, f. *mere ri* to earn money, serve for hire). 1. Of, pertaining to, characteristic of, or befitting a harlot. 2. Alluring by false show of beauty or richness; showily attractive. Oxford English Dictionary, 2nd Edition.

² Licentious, also licentious, adj. [ad. med.L. *licentio-sus*, f. *licentia* LICENCE. Cf. OF. *Licentieux* (F. *licencieux*)] Characterized by licence or excessive assumption of liberty. 1. Disregarding commonly accepted rules, deviating freely from correctness; over-stepping customary limits. Oxford English Dictionary, 2nd Edition.

When tumescent liposuction crosses beyond the pale and into the domain of excessive surgical trauma, it metamorphoses from a benign cosmetic procedure and into a malignant process. A cavalier surgical attitude, a naïve sense of security, an avaricious motivation, or a foolish desire to satisfy a patient's request to "do it all in one surgery" are dangerous ingredients; add general anesthesia to the recipe and the result is a prescription for disaster. There is no antidote for this poisonous combination. The only safe approach is prevention, which requires a knowledge of modern pharmacology and physiology, a careful surgical technique, and prudent limits to the amount and extent of surgery. Above all do no harm.

Ultimately, not even board certification significantly reduces the risk of death from liposuction. The only factor that significantly affects the safety of liposuction is the type of anesthesia that is used. The tumescent technique for liposuction totally by local anesthesia is safer than the semi-tumescent technique that uses general anesthesia or heavy IV sedation.