

Anesthesia challenges in liposuction

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ABSTRACT

One of the most common treatment options in aesthetic surgery, liposuction has certain special anesthetic considerations. Liposuction is frequently carried out at a doctor's office. Based on the amount of infiltration or wetting solution injected, there are four basic types of liposuction techniques: dry, wet, superwet, and tumescent procedure.

One of the most popular liposuction methods is known as the tumescent technique, which involves injecting large amounts of diluted local anesthetic (wetting solution) into the fat in order to facilitate anaesthesia and reduce blood loss. The injection of lignocaine may contain a significant amount between 35 mg/kg and 55 mg/kg raising questions about the toxicity of the local anesthetic

Key Words: *General anaesthesia; Tumescent anaesthesia; Local anesthetic*

INTRODUCTION

According to the amount of solution aspirated, there are two types of liposuction: high volume (>4,000 ml aspirated) and low volume (400-0 ml aspirated). Large-volume liposuction necessitates general anesthesia, whereas small-volume liposuction can be performed under local/monitored anesthesia care. The intraoperative fluid management, together with hemodynamic monitoring and temperature control, must all be carefully titrated as a significant volume of wetting solution is injected into the subcutaneous tissue. Since the blood is mingled with the inhaled fat, measuring the blood loss is challenging. The majority of obese patients choose liposuction as a rapid weight loss procedure, thus all obesity-related issues must be addressed in the preoperative evaluation.

Liposuction is a common plastic surgery procedure as a result of growing public knowledge of cosmetic surgery. Liposuction is the process of employing a cannula and a strong vacuum to remove fat from deposits under the skin. Based on the amount of infiltration or wetting solution injected, four different liposuction procedures have been identified: dry, wet, super wet, and the tumescent technique. The key distinction between these procedures is how deeply they penetrate the tissues and how much blood is lost as a proportion of fluid is sucked. The most popular method for liposuction is the tumescent method.

Tumescent technique

The phrase "tumescent method" was created by Klein. Tumescent means "to swell." In this procedure, very high quantities of diluted local anesthetic are injected into the subcutaneous tissue combined with additions like adrenaline and sodium bicarbonate to expand the tissues and cause them to become hard, puffy, and turgid, or the ultimate goal of strong tissue turgor. As a result, a plane is created from which the suction of fat is made easier with minimal blood loss [1].

According to the amount of aspiration performed, there are two forms of liposuction: high volume (>4,000 ml aspirated) and low volume (4,000 ml aspirated). High-volume liposuction is seen as being substantially more prone to complications than the original form of tumescent liposuction since there is a possibility for major fluid changes related to the volume of tissue removed, with a risk of developing pulmonary edema. Therefore, in high-volume liposuction procedures, intravenous fluids should be utilized with the utmost caution [2].

Wetting solutions

The wetting solutions suggested by Klein and Hunstad are the most popular ones (Table 1). [3,4]

TABLE 1
The following are some components of wetting solutions

Klein's Solution	Hunstad's Solution
1000ml of normal saline	1000 ml Ringer's lactate
50 ml, 1% lignocaine	50 ml, 1% lignocaine
1 ml, 1:1,000 epinephrine	1 ml, 1:1,000 epinephrine
12.5 ml, 8.4% sodium bicarbonate	

Local anesthetics

The most widely used local anesthetic in tumescent solutions is lidocaine, with a maximum dose of 7 mg/kg when combined with adrenaline.

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The maximum dose of lignocaine that can be administered in a tumescent solution may be much higher thanks to the development of tumescent anesthesia [5]. For most patients, a maximum dose of 55 mg/kg of lignocaine is advised; those having liposuction should have a dose between 35 mg/kg and 55 mg/kg. The amount of lignocaine used depends on how vascular the area is that needs to be liposuctioned. It is possible to use 1,500 mg/L of normal saline in the breast and belly, which are more vascular or sensitive areas [6]. In less sensitive regions, such as the thighs, the concentration of normal saline is lowered to 500 mg/L. Louis Habbema observed that a maximum lignocaine concentration of 500 mg/L of the normal saline solution allowed infusion of a considerable volume of wetting solution without any risk of lignocaine poisoning in a series of 3,430 liposuction procedures [7].

ANAESTHESIA TECHNIQUE

Under either local, regional, or general anesthesia, liposuction can be carried out. No one anesthetic method is better than the rest. The method of anesthesia is determined by the location and extent of the liposuction as well as the patient's preferences. Depending on the body parts being operated on—arms, thighs, abdomen, or buttocks—and the amount of liposuction being done, the anesthetic approach will change. Since these treatments are frequently carried out in a daycare setting, it is critical that patients quickly regain their psychomotor and cognitive abilities to allow for early discharge.

Monitored anesthesia care

This is a practical method for the liposuction of tiny volumes. Vasoconstrictor and local anesthetic infiltration, respectively, decrease bleeding and offer intraoperative analgesia. As a result, it enables liposuction to be carried out under minimal sedation, resulting in a speedy recovery, earlier discharge, and lower patient costs. But if infiltration is uneven, certain places won't have enough analgesia, necessitating further sedation [8].

General anesthesia

This is suggested for liposuction of high volumes or if the patient wants it. Due to its pharmacokinetic profile and innate antiemetic characteristic, which guarantees a speedy patient recovery, propofol is the preferred induction agent [9]. A supraglottic device, Proseal LMA (PLMA), or I-gel can be used to preserve the airway. A nondepolarizing medication, such as atracurium, rocuronium, or vecuronium, can relax muscles. Short-acting opioids like fentanyl and remifentanyl, as well as the injection of lignocaine into the subcutaneous tissue, offer analgesia.

POSTOPERATIVE CARE

Pain relief

In tumescent liposuction, pre-emptive analgesia is delivered by the local anesthetic, so little intraoperative and postoperative analgesia is necessary. The amount of time that lignocaine provides analgesia can be greatly increased by mixing it with epinephrine. NSAIDs, often known as non-steroidal anti-inflammatory drugs, may be prescribed to treat postoperative pain.

CONCLUSION

A common method for getting rid of extra body fat is liposuction. It has a significant hemodynamic impact, particularly during large-volume liposuction operations. A full understanding of the physiological changes and potential consequences linked to them is necessary for the anesthesia used for these procedures. A successful outcome is guaranteed by meticulous monitoring and rigorous adherence to intraoperative fluid treatment standards.

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