Review Article

Anesthesia Techniques in In-Office Aesthetic Surgery: A Narrative Review

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Abstract

This narrative review explores the use of anesthesia in in-office aesthetic surgery for non-invasive body contouring procedures. Local and regional anesthesia techniques are commonly employed, with rare complications reported. Transversus abdominis plane blocks are effective in reducing pain and opioid use in abdominal surgeries, while pectoralis, serratus anterior, and erector spinae plane blocks provide good pain control in breast surgeries. The use of ultrasound technology enables plastic surgeons to perform anesthetic blocks, improving patient comfort and reducing opioid reliance. Topical anesthesia is generally safe, while tumescent anesthesia carries a risk of systemic toxicity. Sedation may be utilized alongside local anesthesia to help patients relax and alleviate anxiety during procedures. Further research is needed to explore the safety and efficacy of different anesthesia methods in in-office aesthetic surgery.

Keywords: Anesthesia, Aesthetic Surgery, In-Office Procedures, Body Contouring, Local Anesthesia, Regional Anesthesia.

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Introduction

Body contouring, as the combination of several cosmetic surgical procedures that change the shape of body, is an advanced plastic surgery technique that has been developed over many years since the 1980s (1), that the cosmetic surgeon do a detailed examination of the body as well as the patient's lifestyle in order to consider the best surgical technique (2, 3). People who have lost a lot of weight due to plastic surgeries or strict diets, as well as people who want to reach their ideal weight through surgery might seek performing body contouring surgeries. In both cases, it may be necessary to have more than one surgery to achieve the desired organ (4). In most body contouring surgeries, extensive incisions are made to remove excess fat and skin. In some abdominal cosmetic surgeries, incisions are made on a wide area. The length of the cut and the pattern that is considered can be done differently depending on the desired amount and areas. Also, the opinion of the plastic surgeon and his/her professional experience can have a great impact on the choice of this matter (5). The removed fats can be used for injection to other parts of the body, such as: hips, face, chest, etc. Separation of fat in the sculpting method is done without the slightest damage to the body and destruction of fat cells. As a result, healthy fats are removed from under the skin. Compared to other cosmetic procedures such as filler injections, this procedure lasts longer and has less swelling; while these methods may cause risks such as bleeding, infection, and other side effects due to the large incisions and the need for a long time to recover(6). In contrast, non-invasive methods use different technologies such as laser, cryolipolysis, fractional radiofrequency (FRF), and ultrasound-based methods. Non-invasive body contouring is a method that can reduce the size and remove excess body fat without surgery. These methods are non-invasive and do not require surgery. In most cases, after body contouring, a person can carry out his/her daily activities and there is no need to be admitted and sleep in the hospital (6). These methods do not require large incisions and surgery with less required time for recovery. Also, the risks associated with non-invasive procedures are less (6). However, non-invasive methods are far less effective for some body shape problems such as large fat tissues. In body contouring surgery, early patient movement is crucial to minimize hospitalization duration and reduce complications like pulmonary embolism and atelectasis (7). Adequate pain control is essential for patient mobility and should be a priority for plastic surgeons. Both surgical and non-surgical procedures in body contouring benefit from local anesthesia, as it reduces procedure-related pain, improves patient satisfaction, and prevents complications (8). Anesthesia in plastic surgery, though rare, can have serious consequences, highlighting the importance of maintaining patient safety and avoiding preventable complications. General anesthesia is recommended for body lift surgery. For people who have smaller surgeries and fewer areas to be operated on, a combination of local anesthesia and sedation is usually appropriate. New anesthesia methods are safe and effective, but they also involve risks (8).

Study question:

Based on the PICO method, we structured our study question:

Population: patients undergoing anesthesia under non-invasive body contouring.

Intervention: A non-invasive surgical method refers to a medical procedure or treatment that does not require any major incisions or penetration of the body.

Comparison: Comparison of anesthesia-related complications.

Outcome: decreased incidence of adverse events.

Based on the mentioned aspects of the issue, and as the popularity of non-invasive body contouring procedures has increased, it is necessitating a thorough evaluation of anesthesia-related complications and their impact on patient safety. This study aims to assess whether the use of anesthesia in non-invasive body contouring surgery can effectively reduce the incidence of

adverse events. Understanding the potential benefits and risks associated with anesthesia in these procedures is crucial for optimizing patient care and ensuring positive outcomes. By comparing anesthesia-related complications with alternative methods, this study seeks to provide evidence-based insights that can guide clinical practice and enhance patient safety in the field of non-invasive body contouring.

What are the different types of non-invasive body contouring?

There are various non-invasive body contouring .methods Liposuction and liftings which are the most popular techniques of body contouring, are being done both invasively and non-invasively to collect or remove fat from different parts of the body, including the abdomen, sides, thighs, arms, and neck, or reshape the form (9). In non-surgical buttock lift the buttocks are adjusted as desired, without the need for surgery. Nose lift is the technique that the nose is adjusted to the desired shape using surgery. Fat grafting is the method in that the fat taken from other parts of the body is used as filler in other parts of the body (10, 11). In other techniques, the skin might be removed that cannot be considered non-invasive if considering large incisions, as well as the Bypass or Thigh Lift, breast reconstruction, and neck lifts. Facial Augmentations are among non-invasive methods in which fat or fillers injection is used to increase volumes or correction of facial bone shapes. In some other techniques, using radiofrequency technology, the dimensions of the face are changed as desired (5). In cases where fat removal is objected to, there are several nonsurgical methods like lipolysis. Cryolipolysis uses extremely cold temperatures to destroy fat cells. Injectable lipolysis involves injecting deoxycholic acid into the body to target fat cells. Laser lipolysis uses a laser to destroy fat cells Radiofrequency lipolysis uses ultrasound waves and heat to target fat cells (11).

Patient safety in anesthesia of in-office aesthetic surgery

Ensuring patient safety in the operating room is paramount to minimize postoperative complications in plastic surgery. Attention to key aspects such as airway management, management of specific conditions, and understanding age-related physiological changes are crucial for optimal patient care. Thorough pre-anesthesia evaluations, including comprehensive clinical history, physical examination, and appropriate laboratory tests, aid in identifying potential risks and preventing complications (12, 13). Deviation from recommended protocols can lead to avoidable complications, emphasizing the importance of adhering to guidelines (14). Pulmonary embolism and soft tissue infections are notable complications in plastic surgery (14, 15). Collaborative efforts among anesthesiologists, surgeons, nurses, and healthcare professionals are essential to provide high-quality, up-to-date care and minimize complications (16). The selection and assessment of patients before surgery play a vital role in preventing adverse events, highlighting the significance of meticulous patient management for improved surgical outcomes (17).

Anesthesia of in-office aesthetic surgery

In office aesthetic surgery for non-invasive body contouring procedures, various types of anesthesia can be used depending on the specific procedure and the patient's preferences.

Local and Regional Anesthesia:

This involves injecting a numbing medication directly into the surgical area to block pain sensation. Facial nerve palsy might rarely happen in head local anesthesia(18), which is largely due to the procedural technique of the performer. Some researchers have focused on anxiolytic methods to decrease the movement of patients under surgery to prevent sudden incorrect injections (19). Being familiar with detailed anatomical structures is also important for the performer(20). In published reports of septorhinoplasty, complications directly related to anesthesiology are rare (21). although, rare case reports like unilateral exotropia still exist in the

literature (22); Also, there might be ocular complications associated with dentistry anesthesia (22).

In the abdomen and trunk, based on a systematic review with numerous studies evaluated, transversus abdomen is plane blocks can be effectively used to reduce pain and opioid use in abdominoplasties and abdominally-based microvascular breast reconstruction (23). Pectoralis, serratus anterior, and erector spinae plane blocks provide good pain control in breast surgeries. Serratus anterior block complements pectoralis blocks for broader analgesia coverage. These blocks are safe and easy to administer, effectively reducing pain and opioid consumption in abdominal and breast plastic surgeries (23). With the latest ultrasound technology, plastic surgeons can now use anesthetic blocks previously limited to anesthesiologists. The blocks improve patient comfort, decrease reliance on opioids, and enhance recovery (24). One study performed regional blocks, mainly serratus anterior plane block, on 83 patients, resulting in successful pain relief and reduced hospital stays without complications (24).

Topical Anesthesia:

This involves applying a numbing cream or gel on the skin surface to numb the area before the procedure. Serious complications are extremely rare.

Tumescent Anesthesia:

This is a type of local anesthesia where a larger volume of diluted local anesthetic, along with epinephrine to constrict blood vessels, is injected into the fatty tissue. It helps to numb the area and reduce bleeding during procedures like liposuction. It has the risk of systemic toxicity and should be used with caution (25).

Sedation:

In some cases, sedation may be used in combination with local anesthesia to help the patient relax and alleviate anxiety during the procedure. It can range from mild sedation to deeper levels, such as conscious sedation or monitored anesthesia care (MAC) (26, 27). Major complications might happen due to anaphylaxis due to sedating agents (28)

Conclusion

In conclusion, anesthesia plays a crucial role in in-office aesthetic surgery for non-invasive body contouring procedures. Local and regional anesthesia techniques provide effective pain control and minimize complications. The use of ultrasound technology expands the capabilities of plastic surgeons, allowing them to perform anesthetic blocks previously limited to anesthesiologists. Topical anesthesia is generally safe, while tumescent anesthesia should be used with caution due to the risk of systemic toxicity. Sedation can enhance patient comfort and alleviate anxiety during procedures. Further research is needed to deepen our understanding of the safety and efficacy of different anesthesia methods in in-office aesthetic surgery. Overall, anesthesia choices should be tailored to individual procedures and patient preferences to ensure optimal outcomes and patient satisfaction.

Declarations

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Conflict of Interest

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Ethics Statement

This article does not contain any studies with the human participant or animal performed by any of the authors

Author contributions

All authors contributed toward data analysis, drafting and revising the paper and agreed to be responsible for all the aspects of this work.

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