

Research Article

Protocol for Safe Execution of Liposuction Procedure in An Ambulatory Set-up

Moez Fatima,¹ Faisal Akhlaq Ali Khan,² Maryam Noor³

¹⁻³Department of Plastic & Reconstructive Surgery, Dow University of Health Sciences & Dr. Ruth KM Pfau Civil Hospital Karachi, Pakistan

Abstract

Background: Liposuction is one of the most commonly performed surgical procedures by Plastic surgeons. The safety index of liposuction surgery is high but there is limited data of its safety as a day-care surgery. Generally, procedures done as day-care surgery are advantageous in terms of cost effectiveness, resource utilization, and patient confidentiality. We share our experience of performing liposuction as a day-care procedure.

Methodology: A retrospective descriptive study design was chosen. All patients who underwent liposuction as a day-care procedure over a period of seven years from January 2013 to December 2019 were included. Their record was assessed for the criteria of patient selection for the procedure of liposuction, pre and peri-operative preparation, surgical technique, the total amount of fat removed, anaesthesia, post-operative care, and discharge. After discharge from the hospital, precise queries were made on a phone call, and patients or attendants were specifically inquired about the presence and intensity of symptoms like pain, bleeding, nausea, vomiting, blackout, or fall, or any serious condition that may require readmission to the hospital or emergency hospital visit.

Results: Out of a total of 208 patients, 120 (57.6%) were females, 88 (42.3%) were males. The procedures were done under different modes of anaesthesia, with general anaesthesia being given to the majority (59.1%). The average amount of fat removed during the procedure was 3.9 litres. The average BMI was 28.9. A very low percentage of patients had adverse effects like nausea (0.9%), pain (5.7%), and blackout (0.3%)

Conclusion: This study highlights that liposuction can be done safely as a day-care procedure with strict patient selection. Proper pre-operative, per-operative, and post-operative care and a very stringent follow-up ensure success of this procedure in an ambulatory set-up.

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Corresponding Author | Dr. Moez Fatima, Fellow, Department of Plastic & Reconstructive Surgery, Dow University of Health Sciences & Dr. Ruth KM Pfau Civil Hospital Karachi, Pakistan. Cell: +92 336 0396173, **E-mail:** dr.moezfatima@outlook.com

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Introduction

The surgical technique used for the removal of subcutaneous fat using suction-assisted aspiration cannulas introduced through small skin incisions for the purpose of body contouring, is called Liposuction¹. Liposuction is one of the most regularly performed surgical procedures in the practice of plastic surgeons. The majority of patients prefer choosing a private day-care service for their cosmetic procedures to maintain their

confidentiality and privacy.

Liposuction can be performed employing various methods like simple vacuum assisted,¹ vibroliposuction,² vaser,³ laser,⁴ heat, and cryolipolysis.⁵ The various options for anaesthesia include local, spinal, epidural, and general anaesthesia¹. Selection of the technique of liposuction and form of anaesthesia is dependent not only on patients' condition but also upon the total amount of fat that needs to be aspirated out considering

patient demands and their safety.

Day-care surgical units are established entities where patients are not retained in clinics during night hours. The main advantage of this is the convenience provided to both patients and surgeons. All new advents in the field of surgery and anaesthesiology are directed to make surgery safer for patients with minimum downtime and early recovery.⁶

Overall liposuction is a safe procedure, but there are certain risks one should consider before operating a patient as a day-care case.⁷ Risks include bothersome pain, nausea, vomiting, bleeding requiring readmission in the unit, or emergencies like pulmonary embolism.⁸ Any surgeon will be wary of such complications happening in their cosmetic surgery practice.

The senior author has been performing liposuction as daycare surgery from the year 2011 till date. Most common method of liposuction in our set-up is the vacuum and Vibro-assisted liposuctions, which have proven efficacy and high safety index². Having vast experience of day-care surgeries, we are sharing our standard protocols for patient selection to make surgery as secure and conceivable as possible. We have also defined the protocol we follow to cautiously discharge the patients from the day-care unit, and ensure smooth recovery which is of prime importance.

In Pakistan, cosmetic surgery is still in its infancy. Very few surgeons set out to operate their patients in day-care units, to maintain a strategic distance from uncertainties and defacement. There is a paucity of literature dedicated to day-care cosmetic surgery. This study can offer assistance to our populace of both patients and specialists that cosmetic surgeries can be executed as day-care procedures if certain standards and protocols are strictly observed.

Methodology

This was a retrospective descriptive study, in which we reviewed the medical records of all patients who underwent liposuction as a day care surgery, over a period of 7 years from January 2013 to December 2019. Patients of either gender and of all ages, who underwent only liposuction were included.

Their record was assessed for the criteria of patient selection for the procedure of liposuction, pre and peri-operative preparation, surgical technique, the total amount of fat removed, mode of anaesthesia, post-operative care, and discharge. After discharge from

the hospital, all patients were strictly followed up 5-6 times for the next 72 hours and very precise queries were made on a phone call. Patients or attendants were specifically inquired about the presence and intensity of symptoms like pain, bleeding, nausea, vomiting, blackout, or fall, or any serious condition that may require readmission in the hospital or emergency hospital visit.

Proper patient selection

Following strategies were applied for proper selection of patients:

1. The intrinsic risk factors were considered in selecting patients for day-care surgeries. The general health condition of the patient was assessed based on ASA score. Only those patients falling in ASA 1 and ASA 2 categories were selected for day-care surgery.
2. Complete medical evaluation of a patient, based on history, physical examination, and specific laboratory studies was done by the surgeon and consultant anaesthesiologist 15 days before, and reassessed on the day of surgery.
3. Laboratory investigations (CBC, PT/INR, Anti HCV, HbsAg) were ordered in all patients. Choice of extra pre-procedure laboratory tests (CXR, ECG, ECHO, PFTS, lipid profile, and RBS) depended upon the patient's underlying medical conditions and the likelihood that results will affect the anaesthetic plan and safe recovery of patients.
4. Physical evaluation included general physical assessment and specific local examination of particular sites that require liposuction. The integumentary examination included detection of any infection, cellulitis, scars, stretch marks, signs of poor wound healing from previous procedures or trauma, keloids, hernias (abdominal, umbilical, inguinal, or incisional), and venous varicosities.
5. Psychosocial evaluation included analysis of weight stability, eating and exercise habits, genetic obesity. Patients were also evaluated for their emotional stability to endure the procedure. Comprehensive counselling sessions were conducted and patients were informed regarding procedural details, limitations, and expected outcomes. A history of prior cosmetic procedures was taken to exclude possible body dysmorphism.

Pre-operative and peri-operative preparation:

Informed written consent was taken from the patients for both anesthesia and surgery. The patient and/or

guardian were instructed regarding fasting protocol (6 hours nil per mouth before surgery) and medications to take or withhold. Patients with planned Epidural or Spinal anaesthesia had same protocols. Those who were not at risk of aspiration were allowed to take clear liquids until two hours before surgery. All patients were instructed to remove all ornaments, take shower before coming and be accompanied by one family member. All surgeries were performed in the morning hours.

Anaesthesia:

Along with tumescent technique, either systemic, spinal, regional or epidural anaesthesia was given to ensure adequate patient comfort.⁹ The mode of anaesthesia was chosen by the anaesthetist, depending on the overall health of the patient, the estimated volume of the aspirate to be removed, and the postoperative dismissal plan. A single dose of Cephadrine was given intravenously at the time of induction of anaesthesia.

Infiltration solution:

- **Lidocaine:** Lidocaine is used as the anaesthetic agent in the wetting solution at the dose of 35mg/kg.
- **Epinephrine:** Epinephrine was added in tumescent fluid for haemostasis, dose of epinephrine was 0.7mg/kg.

Surgical technique:

We employed tumescent technique for lipolysis and VIBRO assisted liposuction was used for achieving removal of adipose tissue. Determination of liposuction volume was based on the Patient's BMI, functional status, age, and haemoglobin levels, to define the amount of fat that can be safely removed from their body. However, we never removed more than 5 litres to ensure patient safety.

Post-operative care:

After surgery, all patients were moved to the recovery cell, where their condition was strictly observed for one hour. Before shifting to the room, dressings were inspected for any soakage and changed if necessary. In the room, patients' vitals were regularly monitored. The median duration of NPO post-procedure was 6 hours. Gut sounds audibility was ensured before allowing oral intake.

Discharge:

The general condition of the patient was assessed and documented at the time of discharge. We ensured that they had no nausea or vomiting, were able to use the rest-room independently and that all dressings were

dry. Patients were discharged on oral antibiotic (cephridine), Paracetamol, Diclofenac 50mg, Omeprazole 40mg, with SOS (if required) prescription of ondansetron for nausea. Detailed instructions were given to patients and attendants, both verbally and in writing.

They were given a helpline number at which they can call at any time, and their issues were sorted out by the operating surgeon. It is our established protocol to call our patients on the night of surgery and the next morning to ensure their well-being. On each call, patients or attendants were specifically inquired about the presence and intensity of symptoms like pain, bleeding, nausea, vomiting, blackout, or fall (due to sudden changes in blood pressure especially when they remove their compression garment in the first 48-72 hrs). A critical assessment of the need of hospital admission or emergency visit was made at each phone call.

Results

A total of 208 patients were included in this study. 120 (57.6%) were females, 88 (42.3%) were males (Table 2). The mean age was 40.23 years, weight 74.40 kg, BMI 28.9 kg/m², and mean lipoaspirate was 4.15 litres (Table 1). Procedures were done under different modes of anaesthesia, like general anaesthesia (59.1%), epidural (15.3%), and spinal (20.1%)(Table 2).

A very low percentage of patients had side effects like nausea (4.80%), vomiting (2.88%), pain (5.7%), bleeding from liposuction holes (11.05%), blackout (4.32%), and 0.96 % of our patients complained of fall. None of our patients required an emergency hospital visit after discharge (Table 3). Figure 1 compares the pre- and post-operative pictures of a representative case.

Figure 1: Liposuction Before (above) and After (below)

Table 1: demographic and clinical variables of the patients.

Variable	Average	Minimum	Maximum
1 Age (years)	40.23	21	52
2 Weight (Kg)	74.40	58	80
3 Lipoaspirate (liters)	4.15	1.2	5
4 BMI (Kg/m ²)	28.9	18.62	33.4

Table 2: ASA scores and mode of anaesthesia of the patients.

Variable	n	%
ASA Score		
I	178	85.5
II	30	14.4
Made of anaesthesia		
GA	123	59.1
Epidural	32	15.3
Spinal	42	20.1

Table 3: Complications

Variable	Total Number	Percentage
1 Nausea	10	4.80%
2 Vomiting	6	2.88%
3 Pain	12	5.76%
4 Bleeding	23	11.05%
5 Black Outs	9	4.32%
6 Fall	2	0.96%
7 Emergency Hospital Visit	0	0%



Discussion

Liposuction can be carried out very safely, but can we maintain the same safety index when we plan to do it in day-care units in a developing country? The results of our study substantiate that liposuction can be done as a day-care procedure but there are certain principles and protocols, which if not followed, may compromise the safety of the patient.⁶

Two things can essentially compromise patients; first is surgical errors, which may result due to inappropriate patient selection or any lapse in the execution of surgical technique.⁸ The second is concern regarding anaesthesia safety in day-care surgery.⁹ The minimum criteria for selecting patients for liposuction as a day-care surgery should be a stable medical and psychological status, and adequate social support system.

Regarding anaesthesia safety in ambulatory set-up, and type of anaesthesia to be chosen, the following factors must be taken into consideration during the decision-making process:

- Difficult airway, morbid obesity, obstructive sleep apnoea
- Abnormalities of major organ systems
- Prior anaesthesia with any adverse experience (malignant hyperthermia).
- Current medications, drugs, and allergies
- History of alcohol or other substance abuse

- Presence of a responsible adult who would accompany the patient back to home from the office

Anaesthetic techniques utilizing intravenous sedatives, hypnotics, and narcotics are extensively used in office-based surgery settings. When applied to liposuction procedures, clinical experience suggests an excellent safety margin.^{10,11} Lidocaine has a higher safety index and can be more promptly reversed. Although the recommended dose of lidocaine is less than 7 mg/kg,^{12,13,14} literature has established that it may be used in doses up to 55mg/kg as a tumescent solution.¹⁵ Despite that, toxicity may occur when using such large doses.^{16,17} Signs and symptoms of lidocaine toxicity include light-headedness, restlessness, drowsiness, tinnitus, a metallic taste in the mouth, slurred speech, and peri-oral numbness. These signs appear at plasma levels between 3 and 6 µgram/ml. Trembling, muscle twitching and tremors are evident when plasma levels reach 5 to 9 µgram/ml.¹⁶ Seizures, central nervous system depression, and coma follow at plasma levels greater than 10 µgram/ml. Above these levels, respiratory depression and cardiac arrest can occur.^{18,19}

Although systemic toxicity remains the chief focus of concern, data suggests that neurologic injury and cardiac arrest were both more frequent than systemic toxic reaction.²⁰

The recommended dose of epinephrine is 0.7 mg/kg, but higher doses have been used safely.¹¹

In our study, no patient had any adverse effect from any mode of anaesthesia (general, epidural, or spinal). The use of general anaesthesia for liposuction has been a source of professional debate and there are unsubstantiated implications regarding its safety.^{21,22} However, studies prove that general anaesthesia is safe and effective in an accredited office-based surgery facility.

Epidural anaesthesia coupled with the infusion of anaesthetic infiltrate offers consistent intraoperative comfort to the patients. Chloroprocaine, an anaesthetic agent, is often used as it rapidly metabolizes and has the lowest systemic toxicity risk amongst other local anaesthetic drugs. However, epidural anaesthesia can cause vasodilation and hypotension, which results in the administration of extra fluid and an increased risk of fluid overload.²³ Spinal anaesthesia is also deemed safe for day-care procedures. The risk of cardiac arrest with spinal anaesthesia appears to be 3 times higher than the risk of having a systemic toxic reaction with all regional techniques combined. Pollard concluded that the appa-

rent risk of cardiac arrest during spinal anaesthesia is approximately 7 for every 10,000 anaesthetics.²⁴

An important aspect of post-operative care is the assessment of phases of a patient's recovery that requires monitoring, state of co-morbidities of the patient, and optimal time for the safe discharge of the patient.²⁵ In our set-up, patients were accommodated in an amicable environment, where all facilities of post-operative care were provided. The accessibility to anaesthesiologist and surgeon was enacted beyond any doubt in times of necessity.

In a study conducted by Kaoutzanis et al, the most frequently reported post-operative complaint was nausea and vomiting (1.02%) which is comparable to our study, nausea 0.9% and vomiting 0.3%. And the most frequently reported major complication in their study was skin slough 0.0903%, none of our patients had this complication. In all, the rate of major complication rate is 0.2602%, these complications included contour irregularities, unplanned hospital admission, and prolonged swelling⁷. In our study, no patient required readmission for any reason substantiating the safety of liposuction.

Post liposuction compression garment is obligatory, patients were asked to wear a corset after liposuction as standard to maintain compression on the lipo-sculpted areas²⁶. All patients were informed that in the initial 24-48 hours, brisk removal of this garment may result in a blackout due to sudden changes in blood pressure.²⁷ Although few encountered this symptom, it was uneventful.

Nausea and vomiting were tolerable and no patient required any intravenous medication for it. A few patients were concerned regarding bleeding from wounds, but all had serosanguinous fluid. They were reassured and directed to reinforce the dressing. None of our patients ever needed to visit the emergency unit after liposuction.

Conclusion

Daycare surgery is a safe option for liposuction. It can be done under any mode of anaesthesia (general, spinal, or epidural). Certain guidelines should be practiced to make it uneventful for both patient and surgeon.

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