

General Anesthesia in an Office-Based Plastic Surgical Facility: A Report on More than 23,000 Consecutive Office-Based Procedures under General Anesthesia with No Significant Anesthetic Complications

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The popularity of elective office-based plastic surgery has increased significantly over the past two decades. The continuing demand for improved aesthetic results has stimulated the development of ever more complex plastic surgical techniques. These techniques may require extended periods of operative time spent under anesthesia. Patients have come to expect an almost perfect anesthetic and surgical experience, with safety and comfort being their foremost concerns. Because of increasingly complex and lengthy operations, the authors believe that intravenous sedation, used for many years in their plastic surgery practice, is now suboptimal for most longer and complex surgical procedures. In their experience, under most circumstances, general anesthesia provides the optimal anesthetic experience for the patient, anesthesiologist, and surgeon. The authors present a consecutive 18-year study of general anesthesia in more than 23,000 procedures in an accredited, office-based plastic surgical facility that offers a very safe and uniformly pleasant anesthesia experience for patients. There were no intraoperative or postoperative deaths and no significant complications. The authors' experience differs from the common perception that general anesthesia is too risky for aesthetic surgery procedures. (*Plast. Reconstr. Surg.* 107: 243, 2001.)

During the 1970s and 1980s, anesthesia for office-based plastic surgery usually consisted of intravenous sedation, often given without an anesthesia professional in attendance. This technique provided less than ideal patient and operative conditions and was usually limited to short procedures. Initially in our practice, intravenous anesthesia was provided for short procedures by administering ketamine, brevitall, and diazepam before local anesthetic injec-

tions.¹ No serious complications were noted, but this protocol provided nonuniform sedation and was not adequate for longer operations. This method was followed by a few years of providing intravenous sedation by an anesthesia professional. Various combinations of barbiturates and narcotic drugs were used.¹⁻³ While administering intravenous sedation, one of the complication concerns was the maintenance and security of a patient's airway, especially in long or complex nasal or facial procedures. Many surgeons and anesthesia professionals use monitored intravenous sedation, believing that general endotracheal anesthesia is significantly riskier.^{2,4-8} The risks of both intravenous and general anesthesia are well known.^{2,6-9} As with any anesthetic technique, definite well-known risks are associated with either local anesthesia alone or intravenous sedation.^{4-6,10-12} Medication overdoses and toxic reactions to large doses of intravenous and local anesthetics occur.^{10,11} In our opinion and practice, monitored intravenous sedation is acceptable for surgical procedures of short or moderate length, whereas longer and more complex procedures are best performed under general anesthesia.

When using intravenous sedation alone, large doses of sedatives often left a patient feeling "hung over" for days. With modern agents such as propofol,¹³ this problem has been minimized. We continue to advocate the

use of intravenous propofol and local anesthetic injections for short procedures to minimize pain. With intravenous sedation, the risk of airway obstruction secretions and aspiration and/or laryngospasm, especially during septoplasty or rhinoplasty, remains a significant concern to anesthesiologists.^{2,4,6-8,14} Surgical procedures performed below the neck often allow the anesthesia professional to monitor the patient's airway from the head of the bed. During facial procedures, the surgical team may obstruct the anesthesia professional from a clear view of the airway. It is often the surgeon rather than the anesthesia professional who sees the airway. Oversedating a patient may inhibit important airway protective reflexes. The use of properly functioning, updated monitoring equipment is imperative (especially O₂ and CO₂ monitors).^{3,5,8,9,15-18} This has significantly reduced the risks of both intravenous sedation and general anesthesia.¹⁹⁻²² Also, it is extremely important that the surgical facilities that use intravenous sedation and general anesthesia have full accreditation and qualified staff.²³ It is our and others' opinion that less attention to equipment and staff concerns is common in nonaccredited surgical facilities.^{8,9,22,24} The risk of problems is further magnified when longer, more complicated, and intricate procedures are performed under intravenous sedation in a suboptimal setting.^{8,9,20,21,25,26}

General anesthesia also has significant risks.^{2,4,6,7} It is our opinion that many of the mechanical risks of intubation and extubation and cardiorespiratory complications have been substantially reduced by state-of-the-art anesthetic machines, CO₂ monitoring, automatic blood pressure, ECG units, and office surgical facility accreditation. When intubation may predictably be difficult or contraindicated, a Laryngeal Mask Airway (Gensia Automedics, San Diego, Calif.), a reusable silicone pharyngeal airway monitoring device, has been used.¹⁴ General anesthesia delivered by an anesthesia professional using precise, state-of-the-art monitoring anesthesia equipment in an accredited facility has alleviated the concerns of the patient, anesthesia professional, and surgeon and has substantially decreased risks and complications.

General anesthesia for an office-based cosmetic and plastic surgical facility was unpopular in the past because (1) plastic surgery facilities were not equipped or staffed to provide general anesthesia; (2) nonuniform and unrefined gen-

eral anesthesia techniques failed to ensure a safe and pleasant experience for the patient (who often experienced nausea, sore throat, and combative impulses)¹⁵; and (3) additional expenses were incurred by the patient and surgeon with the use of general anesthesia in a certified facility, the anesthesia professional's fees, and the appropriate staff and equipment.

In our opinion, general anesthesia has the following advantages over intravenous sedation: (1) attentive general endotracheal anesthesia decreases the risk of intraoperative airway obstruction, aspiration, and possible intraoperative laryngospasm,^{2,6,7,27} which is especially important in upper airway procedures such as septoplasty and rhinoplasty and for patients at high risk for regurgitation or aspiration^{2,7,25}; (2) patients are comfortably asleep, and the surgeon can focus full attention on the operation without the distraction of inadvertent patient movement; and (3) the seesaw effect of intravenous sedation is eliminated.¹⁵

The patient's safety must be of primary concern. In addition, what cannot be overlooked is the comfort and experience of both the patient and surgeon.^{15,26,28} We believe that a personalized general anesthesia program can significantly contribute to meeting these goals. The risks of general anesthesia in the hands of well-trained anesthesiologists using state-of-the-art monitoring and pharmacological techniques on a healthy patient in an appropriately accredited facility are indeed minimal.^{2,8,9,17,21,22,25} These techniques, refinements, and other "pearls" accumulated during 18 years and 23,000 procedures in our surgical office facility, when implemented with strict attention to detail and technique, have provided a pleasant and safe surgical and anesthetic experience for the patient (Tables I through III).

ANESTHESIA PROGRAM

The patient's anesthesia experience begins well before the operation.^{15,29} During the initial consultation, the patient is told by the surgeon that the anesthetic experience is much like taking an airplane trip.⁶ The passenger boards the plane, bestows full confidence in the pilot and crew, falls asleep during the trip, and wakes up after landing.⁶ There are fears and risks with both flying and general anesthesia. We think that both are the safest way to travel.

Patients are informed that the surgeons and anesthesiologists in our facility are board certified and that the facility itself is certified by

TABLE I
Significant Anesthetic Complications

Complication	Occurrences
Deaths	None
Stroke	None
Cardiac arrest	None
Myocardial infarction	None
Pulmonary embolism	None
Aspiration	None
Hypertension emergency	None
Liver failure	None
Anaphylaxis	None
Renal failure	None
Equipment failure*	Rare
Malignant hyperthermia	None
Hospitalization for complication†	None
Seizures	None

* Battery failure on ECG monitor and O₂ monitor rarely noted. No patient complications.

† There were three hospitalizations for custodial care at the patient's request. Most patients, after a 23-hour observation by a licensed nurse, went to a 2- to 5-day recovery center or home with a screened caregiver.

the American Association for Accreditation of Ambulatory Surgery Facilities.^{23,30} The patient is provided with an information packet, including an anesthesia information sheet, which usually adequately provides answers to most patients' questions. The patient's medical history, physical examination, and laboratory test results are reviewed early by the doctor and nurse and are cleared by both the anesthesiologist and surgeon before any procedure. The operating room nurse telephones the patient several days before the anticipated procedure. This preoperative, unhurried telephone interview allows the nurses to introduce themselves and inform the patient of the anticipated plan of care. This is important to establish good rapport with the patient and achieve the goal of a comfortable operating room experience. The anesthesiologist telephones the patient several days before, and again the night be-

fore, the operation to address the medical history and the procedure and to discuss any concerns of the patient. These telephone interviews by the anesthesiologist are designed ensure the patient and staff's goal of a safe and pleasant surgical and anesthetic experience. The discourse allays the patient's anxieties and assures him or her that any special concerns will be addressed.^{4,7,15} Before surgery, psychological stress is greatly alleviated by this calm, confident, nonpharmacological verbal communication. Especially anxious patients are reminded that, if they so desire, they may take an oral anxiolytic, such as diazepam, the night before their operation and again on the morning of the operation (with very minimal water) before their arrival.²⁹ It is not unusual for our patients to have their procedure delayed or cancelled until full medical, anesthesia, and surgical clearance is obtained.

On the patient's arrival, he or she is escorted by a nurse into the preoperative holding area, which is private and equipped with a warmed lounge chair, bathroom, locker, television, VCR, and stereo. Here, the patient changes into a surgical gown for presurgical preparation in an unrushed manner. Sufficient time is allowed for this important preoperative preparation. Close attention is paid to maintaining the warmth of the patient when he or she is wearing surgical gown attire. Electric blankets and heating pads are available, the room is kept warm, and booties or socks are provided. An interview and examination by the surgeon and anesthesiologist, surgical markings, and photographs are completed. After appropriate consent forms are signed, the patient receives an oral anxiolytic, usually diazepam 5 to 10 mg, and a small dose of oral clonidine (Catapres,

TABLE II
Temporary Anesthetic Side Effects

Side Effect	Occurrences
Sore throat (postextubation)	<5%
Postnasal case sore throat	5% due to packing
Nausea, emesis	<5%
Complaints of prolonged effects of anesthesia	One patient complained of hair loss, which improved with topical application of Rogaine.
Shivering	Minimal overall; 10% after liposuction cases; no significant hypothermia noted.
Reported awareness during anesthesia	None
Intravenous infiltration	Rare
Broken filling	One posterior filling lost (noted the day after surgery); not noted to be caused by anesthesia.
Deep vein thrombophlebitis	One patient, 10 days postoperatively. The patient was given an anticoagulant with no further sequelae.
Nerve injury or paralysis	One episode of recurrent carpal tunnel syndrome was reported after intravenous infiltration.

TABLE III
Procedures Performed during Past 18 Years

Procedure	<i>n</i>
Open or endoscopic coronal or temporal lifts	1850
Face lift, neck lift	2950
Nasal surgery	2275
Breast augmentation and revision, and breast reconstruction	2850
Breast reduction	600
Mastopexy, nipple repositioning, or recontouring	1410
Liposuction, abdominoplasty, thigh lifts, or body sculpturing	2620
CO ₂ laser, peel, dermabrasion	1850
Cheek, lip, and/or chin augmentation, facial injections	1815
Blepharoplasty, canthopexy, cheek lift	3200
Miscellaneous*	1840
TOTAL	23,260

* Hair transplantation, minor scar revisions, burns and combined reconstructive procedures, otoplasty, cancer surgery, major scar revisions, and injections. Most patients had one to two major procedures. When the same patient had multiple major procedures, these were usually staged on two or more separate dates.

Boehringer Ingelheim Pharmaceuticals, Ridgefield, Conn.), usually 0.05 to 0.10 mg. These medications lessen the requirements for anesthesia, have a sedative effect, and decrease sympathoadrenal stimulation, allowing for optimal blood pressure control both intraoperatively and postoperatively.^{2,8,13,28,31} We have noted remarkably decreased postoperative shivering and pain in patients who have received clonidine and our warming routine.

In this warm, comfortable preoperative environment, the patient is given a set of headphones and tapes to experience video-recorded images specifically designed to induce tranquility.

OPERATIVE PREPARATION

After the above protocol is completed, the patient is escorted to the operating room, where he or she is covered with thick, warm blankets. The operating room is kept quiet and soft music is played.

Local anesthesia with a no. 30-gauge needle is used before starting the intravenous line. If the patient is needle-phobic, lidocaine 2.5% and prilocaine 2.5% (EMLA, Astra Pharmaceuticals, Westborough, Mass.) cream³² is applied to the intravenous site on office arrival to help ensure the painless induction of intravenous sedation. The antecubital space or a large forearm vein is used when possible to minimize the injection discomfort of drugs that may sometimes occur when the smaller hand veins are used. Intravenous fluids are warmed.^{15,33} Cast padding is used between the automatic blood pressure cuff and the skin to decrease the patient's discomfort from cuff inflation while

awake and to minimize the possibility of skin fold irritation afterward. Patients are also given an oral breath spray at this time to mitigate "cotton mouth" and to allay their concerns of malodorous breath. Increased sedation is further administered during the application of the monitors with an additional anxiolytic, such as intravenous midazolam.^{1,15} Patients may be allowed to hold their preoxygenation mask to decrease claustrophobic reactions. Masks are frequently pretreated with pleasant smelling, fruit-flavored drops to disguise the odor of plastic. All monitors are put in place and activated before anesthesia is induced.^{6,7,25} Uniformly, the surgeon, the registered nurse, and the anesthesiologist are present during the intubation and extubation periods, and the entire operating room team is attentive.

The patient's position on the operating room table is crucial. In addition to the cast padding under the blood pressure cuff, soft foam pads are positioned under the patient's knees and ankles, elbows and wrists, and back and neck; all bony areas are padded. Before anesthesia, patients are specifically asked if they feel completely comfortable and if they have any orthopedic problems. During this preinduction time, operating room noise and conversation by the staff are kept to an absolute minimum. Earplugs may also be considered. Patients are spoken to in a calm, reassuring voice as the CO₂ and pulse oximeter, blood pressure cuff, ECG, and temperature monitors are placed. Unrushed oxygenation and intravenous sedation are initiated. Patients are informed of the specific noises they may hear when a monitor is activated.

Promoting both patient safety and a good anesthesia experience is important. Patients lie in the operating room for only a short period of time before anesthesia is induced. Again, soft music is played while they relax with the warm blankets and comfortable pads, a step more important to the patient than previously recognized. The surgeon and anesthesiologist speak to the patient in a soft tone using suggestive imagery, and small, tranquil pictures of birds, sunsets, and so forth are placed on the ceiling for their viewing and distraction. Patients are asked to visualize a place where they would like to be (e.g., perhaps lying on a warm, sandy beach with palm trees swaying in the breeze, gentle ocean winds, and crystal-clear blue water). This sort of imagery helps to in-

duce an almost hypnotic state of relaxation before induction.¹⁵

INDUCTION OF ANESTHESIA AND POSTINDUCTION PREPARATION

As preoxygenation is begun with the pleasant-smelling mask (fruit-flavored drops), the patient is already sedated with intravenous midazolam and oral premed diazepam plus clonidine. We may use a minimum amount of narcotic, 1 to 2 cc of fentanyl (Sublimaze, Akorn, Abita Springs, La.), and a small dose of droperidol (Inapsine, Akorn) to enhance the sedated state. Induction is accomplished with propofol (Diprivan, Zeneca Pharmaceuticals, Wilmington, Del.), 2.0 to 2.5 mg/kg, slowly administered intravenously through a high-flow line to ease injection discomfort. We always precede the propofol with intravenous lidocaine (Xylocaine, Astra), 20 mg, to lessen the discomfort from the propofol injection. After induction of anesthesia, we administer a nondepolarizing relaxant. Our relaxant of choice is vecuronium (Norcuron, Organon Inc., West Orange, N.J.), usually 0.1 mg/kg, to facilitate endotracheal intubation. We use a plastic dental guard during intubation to protect the patient's teeth, and we apply a small amount of water-based K-Y Jelly (Johnson & Johnson, Arlington, Texas) for a lower incidence of sore throat than when lidocaine gel or ointment is used. The use of a laryngo-tracheal anesthesia kit (Abbott, Chicago, Ill.), approximately 100 to 200 mg sprayed intratracheally, helps to facilitate placement of the endotracheal tube by increasing the moisture content and lubrication of the larynx and upper trachea, lowers hypertension during intubation, and reduces the incidence of postoperative sore throat. The endotracheal tube cuff is inflated just to seal. The cuff will expand during the operation with the use of nitrous oxide as it enters the cuff. Therefore, we periodically remove small amounts of excess gas from the endotracheal tube cuff to minimize tracheal pressure when nitrous oxide (N₂O) is used. Nitrous oxide is not used in patients with a history of postanesthesia nausea.^{2,31}

After establishing the proper placement of the endotracheal tube with the usual techniques (e.g., endotracheal tube misting, CO₂ monitor, and bilateral equal breath sounds), the tube is secured to the teeth (lateral incisors) with dental floss, preferably unwaxed. When indicated or desired, a Laryngeal Mask

Airway (Gensia) can be substituted for the endotracheal tube.³² An inhalation agent, usually desflurane (Suprane, Ohmeda Pharmaceuticals, Liberty Corner, N.J.), with or without nitrous oxide, is begun. Particular effort is made to avoid tube pressure against the lips. After the tube is tied into place, it is positioned to not obstruct the surgical field. A lubricant such as Vaseline is applied to the lips to retain moisture. A saline-moistened gauze sponge is placed inside the mouth, over the tongue, to maintain tongue and pharyngeal structure moistness during the procedure. This decreases postoperative "cotton mouth" and may lessen pharyngeal irritation. For septoplasty and rhinoplasty, we use a saline-moistened deep pharyngeal pack and nasal Vaseline gauze to minimize the blood that enters the pharynx and stomach, a potential cause of nausea and vomiting. The patient's trunk and arms are then firmly secured with well-padded restraints.

The arms are placed in a comfortable position with attentive ulnar nerve and heel padding. The eyes are protected with an ophthalmic lubricant at this point and are taped shut (or, if indicated, sutured shut), except in patients who will be undergoing blepharoplasty. Patients scheduled for blepharoplasty receive diclofenac (Voltaren, CibaGeneva, Ciba-Geigy Corp., Summit, N.J.), 0.1% ophthalmic solution, one drop per eye, and fluoromethonone (Fluori-Methane, Gebauer Co., Cleveland, Ohio), 0.1% ophthalmic drops, two drops per eye, 15 minutes preoperatively to decrease conjunctival edema.^{15,29,31} After blepharoplasty, the eyes are irrigated intraoperatively with sterile saline contact lens solution and lubricated with ophthalmic ointment. The eyes are then closed or sutured shut until the completion of any other procedures.

After initial preparation of the surgical area with warm povidone iodine (Betadine, Purdue Frederick, Norwalk, Conn.) or chlorhexidine gluconate (Hibiclens, Zeneca), a local anesthetic, either 0.5% lidocaine with epinephrine 1:200,000 (Xylocaine, Astra) or 0.25% bupivacaine with epinephrine (Marcaine, Sanofi Winthrop Pharmaceuticals, Morrisville, Pa.), is infiltrated and appropriate nerve blocks are performed. A modified tumescent solution is often used to infiltrate the entire operative area.^{24,34} A diluted local anesthetic injected with a blunt needle, plus intraoperative wound irrigation performed with a diluted solution of

bupivacaine, 0.25% with epinephrine 1:200,000, results in a significant decrease in postoperative pain.³⁵ If transient tachycardia is noted secondary to local anesthesia infiltration, it is treated with a short-acting beta-blocker such as intravenous esmolol. Intravenous propranolol (Inderol, Wyeth-Ayerst Laboratories, Philadelphia, Pa.) is a good alternative. Before injection of local anesthesia, a triad of medications [specifically, dexamethasone (Decadron, Merck & Co., West Point, Pa.), 8 mg; diphenhydramine (Benadryl, Parke-Davis, Morris Plains, N.J.), 50 mg; and cefazolin (Ancef, SmithKline Beecham, Pittsburgh, Pa.), 1 g] is administered intravenously. It is our opinion that the combination of dexamethasone and diphenhydramine decreases bruising and swelling and that the cefazolin antibiotic should be given initially and repeated once the patient is at the postanesthesia recovery stage.¹⁷ We do not use postoperative antibiotics unless a prosthesis is inserted. A Foley catheter may be placed preoperatively when a lengthy procedure is anticipated.⁴ We minimize intravenous fluids when a Foley catheter is not used to decrease bladder distention in the patient. Patients are more likely to become cold during long procedures, so all extremities and the head (if not a surgical site) are covered with plastic bags to retain heat.¹⁵ Intravenous fluids are warmed. Before induction, automatic flowtron wraps, Alternating Leg Pressure Units (Health Care Service Supply, Tustin, Calif.), are applied to the lower legs, especially for procedures that last longer than 2 hours. During breast operations in which the patient's head and trunk areas may be elevated while he or she is under anesthesia, the arms are secured on arm boards with Velcro and/or a circumferential Kling bandage (Johnson & Johnson), and all bony areas are well padded, especially under the elbows and wrists. The surgeon closely monitors any positional change of the operating room table and communicates with the anesthesiologist before making any such changes. This is to ensure that proper endotracheal and extremity positioning is maintained while the patient is moved.

INTRAOPERATIVE ANESTHESIA BLOOD PRESSURE MANAGEMENT

Intraoperative anesthesia management includes meticulous blood pressure control. In many cosmetic procedures, such as face lift and

breast reduction, minimizing blood loss during dissection is important. We attempt to keep the systolic blood pressure level at approximately 90 to 95 mmHg for nonhypertensive young to middle-aged patients during surgical dissection. Occasionally, we use a nitroglycerin transdermal patch (e.g., Nitro-Dur, Key Pharmaceuticals, Kenilworth, N.J.), nitroglycerin ointment (e.g., Nitrol, Savage Laboratories, Melville, N.Y.), or intravenous nitroglycerin and an inhalation anesthetic in patients with high blood pressure who seem unresponsive to the preoperative clonidine. Labetalol (Normodyne, Key Pharmaceuticals) is another frequently used agent. For elderly or hypertensive patients, blood pressure levels are kept appropriately higher. When hemostasis is obtained during a face lift operation, the patient is placed into a Trendelenburg position to increase the blood pressure level.³² Then, the systolic blood pressure in the nonhypertensive young, healthy patient is allowed to rise over 120 mmHg, so that all bleeding points may be dealt with in detail. Similarly, with older and/or hypertensive patients, blood pressure levels are allowed to rise proportionately higher so that bleeding points may be appropriately coagulated to avoid postoperative hematoma. With this regimen, our incidence of postoperative hematoma, especially with face lifts, is extremely low (0.1 percent).

Intraoperatively, the patient is maintained with controlled ventilation and depth of anesthesia to help mitigate the possibility of inadvertent movement. This is especially important during delicate facial and eyelid dissections. All patients are closely and continuously monitored with ECG, blood pressure, pulse oximeter, CO₂ saturation, and temperature indicators.

ANTIEMETICS

A patient's history of nausea with anesthesia is taken seriously. Intravenous droperidol (Inapsine, Astra), 0.25 cc to 0.5 cc, is given at induction, and an additional dose is given near the end if the procedure exceeds 4 hours in duration. Metoclopramide (Reglan, A.H. Robbins, Richland, Va.), 10 mg intravenously, is used early in the operation as well. We also have found dronabinol (Marinol, Roxane Laboratories, Columbus, Ohio), 2.5 mg given sublingually, to be especially effective in refractive patients with a history of or concern about nausea. After being punctured with a needle, the capsule and contents are placed sublingually by squeezing through a needleless 3-cc

syringe. Dronabinol is most useful for patients with a history of refractory postoperative nausea and is administered during the last 30 minutes of surgery. In addition, ondansetron (Zofran, Glaxo Wellcome, Research Triangle Park, N.C.), 4 mg intravenously, or dolasetron mesylate (Anzemet, Hoechst Marion Roussel, Kansas City, Mo.), 12.5 mg intravenously, may be given, preferably within the last 30 minutes of surgery to patients with a history of nausea and vomiting.^{21,36} N₂O and large doses of narcotics are avoided in patients with a history of nausea or vomiting with anesthesia.³¹ This has almost totally eliminated our incidences of nausea or emesis. Our program strongly addresses the prevention of significant anesthetic complications (Table I) while minimizing temporary, unexpected anesthetic side effects (Table II).

CONCLUSION OF THE OPERATION

The surgeon administers bupivacaine (0.25% with epinephrine 1:200,000) and/or lidocaine (0.5% with epinephrine 1:200,000) nerve blocks to the operative areas to decrease postoperative pain. It should again be noted that during the operation, especially in face lift and breast procedures, 0.25% bupivacaine diluted with 1:200,000 epinephrine is sprayed into the operative site, under the flaps, to decrease postoperative pain.³⁵ Pain is usually quite minimal with the above approach. A nerve stimulator is used to check for any residual paralysis before endotracheal extubation. The recovery nurses are alerted that the end of the operation is approaching, and they begin warming the recovery room with infrared ceiling heaters and blankets. Ventilation is progressively slowed near the end of the procedure, and the patient is allowed to resume spontaneous ventilation. Close surgeon-anesthesiologist communication as to the end-point of the operation is important to ensure a smooth termination and prevent having to re-anesthetize the patient. The oropharynx is gently suctioned. We find that a soft, flexible catheter is less likely to cause pharyngeal irritation compared with the traditional, stiff Yankauer catheter (Allegiance Health Care, McGraw Park, Ill.). This decreases coughing and postanesthesia gagging. The patient is gently suctioned after the removal of the moist mouth pack or, in the case of septoplasty and rhinoplasty, the deeper, moist pharyngeal throat pack. By means of gentle suctioning, we assess the level of pharyngeal reactivity. If

“bucking” seems to be imminent, we use either 1 to 1.5 mg/kilo intravenous lidocaine or 2 cc to 3 cc of intravenous propofol. When good spontaneous respiration has returned, and at the point of laryngeal competence, the patient is gently extubated. The operating room staff is attentive to this important step. If dressing application is to be done in an upright position, as in breast surgery, this is addressed after extubation to avoid bucking. Similarly, cleansing the patient’s facial area or hair, with associated movement of the head, is delayed until after extubation to avoid bucking as well. The patient is not taken from the operating room, nor are monitors removed, until he or she is awake and normotensive and an adequate airway is confirmed. The surgeon ensures an optimal surgical and anesthetic result *before* exiting the operating room. The patient does not leave the safety and supervision of the operating room until both surgeon and anesthesiologist approve.

RECOVERY ROOM

The patient is transferred to a bed and is taken to the recovery room. He or she has been kept warm throughout the entire procedure, so it is important to maintain continued warmth in the recovery area. Monitored electric blankets and overhead infrared heat lamps or Bair Hugger warming blankets are prepared ahead of time. No tight masks are applied after facial or nasal procedures. Rather, a loosely fitting mask or a “cut” mask (one-half mask) is gently applied to the face to avoid pressure on the nasal and facial surgical areas while allowing the administration of a good supply of postoperative oxygen. Again, ECG, blood pressure, and pulse oximeter monitors are applied and kept in place for a prolonged period postoperatively to ensure the patient’s safety.^{6,7,25} The recovery room nurse does not leave the patient’s side for any reason until the patient’s vital signs are stable and the patient can raise his or her head and clearly answer questions. The recovery room, video, and vital sign monitors are set up for continuous visual and auditory monitor appraisal of the patient. The patients usually are awake and talking within 10 to 15 minutes. Postoperative pain and/or nausea are notably minimal.

Postoperative shivering is greatly mitigated by the use of preoperative clonidine.²⁹ Should it occur, we treat it with Demerol, 12.5 to 25 mg intravenously. Shivering is more common with

major liposuction procedures, secondary to greater body surface exposure in the operating room with resultant heat loss. Attention to minimizing intraoperative heat loss is reassuring to the patient.^{2,15,21,30}

Prevention of nausea is especially important to patients who have previously experienced it. It is minimal with the regimen we have used. Dronabinol has proved to be an extremely useful agent, in difficult cases, with minimal side effects. In fact, certain patients who were previously refractory to other anti-emetics had minimal or nonexistent nausea and vomiting when given dronabinol. Our personalized general anesthesia program promotes close attention not only to the safety but also to a prospective good experience for our patients.

The anesthesia risk classification for most of our patients was class I to II. Although we have treated patients who were at higher risk for anesthesia problems, the complexity and duration of their anesthetic procedure were restricted. We confirm the patient's pleasant surgical outcome with extensive postoperative follow-up, including telephone calls to the patient and numerous postsurgical office visits. Our goal of providing a high degree of safety and comfort and a good experience for the patient, surgeon, and anesthesia professional has been met uniformly with this program.

SUMMARY

We reported on 18 consecutive years of a general anesthesia experience (more than 23,000 procedures) in an accredited, office-based, plastic surgical facility with no intraoperative or postoperative deaths and no significant complications. Our results do not support the recently reported literature pointing to general anesthesia as contributing to or causing significant complications or even death with liposuction procedures.¹¹ They do support the advantages and efficacy of general anesthesia for plastic surgery procedures, including liposuction, when performed by competent, board-certified anesthesiologists in a properly equipped and accredited facility. This regimen of general anesthesia, with supplemental local anesthesia and nerve blocks, performed with strict attention to detail as outlined herein, has resulted in optimal conditions for surgical procedures, patient comfort, and safety.

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