

Safety and Efficacy in an Accredited Outpatient Plastic Surgery Facility A Review of 5316 Consecutive Cases

Abstract:

Advances in medicine have improved the delivery of health care that is more complex and technologically superior than ever. Nowhere is this more evident than in the surgical arena. The ability to duplicate plastic surgery procedures in an office-based facility - once reserved only for hospital - based or ambulatory surgery centers has provided a convenience to both the surgeon and the patient. Some groups have challenged that performing plastic surgery procedures in an office - based facility is compromising patient safety. The purpose of our study was to determine how outcomes are adversely affected by performing plastic surgery procedures in an accredited outpatient surgical center.

A retrospective review was performed of 5316 consecutive cases that were completed between 1995-2000 at Dallas Day Surgical Center - an outpatient surgical facility. The majority of these cases were cosmetic procedures. All cases were analyzed for any potential morbidity or mortality. Complications requiring a return to the operating room were determined as were infection rates. Events leading to inpatient hospitalization were also included.

In this 6-year period there were 35 complications (0.6%) and there were no deaths. The majority of complications were secondary to hematoma formation (77%). The postoperative infection rate was 0.52%. Seven patients necessitated inpatient hospitalization following their procedure, which was secondary to arrhythmias, angina, and pulmonary emboli.

Hematoma	Infection	Return to OR	Transfer to Hospital	Deaths
0.5%	0.11%	0.66%	0.13%	0%

Patient safety must take precedence over cost and convenience. Any monetary savings or time gained is quickly lost if safety is compromised and complications are incurred. The safety profile of the outpatient facility must meet and/or exceed that of the traditional hospital-based or ambulatory care facility. We have reviewed our experience over the last 6 years in which there were few complications and no deaths. We continue to support the judicious use of accredited outpatient surgical facilities by board certified plastic surgeons in the management of plastic surgery patients.

Introduction:

Performing operative procedures in one's office has been practiced for years, however the scope of procedures has expanded. Technology has modified and even created new procedures. Previously, limitations of anesthesia precluded more complex procedures being performed in an outpatient setting. IV conscious sedation with appropriate monitoring allowed more cases to be done in facilities other than a traditional hospital setting. Furthermore, advances in technology and anesthesia monitoring have now enabled traditional hospital operating room equipment to be duplicated in outpatient

facilities. The advent of performing office-based procedures has afforded the plastic surgeon a convenience that was previously not available, largely because of compromises in safety.

The delivery of outpatient surgical services has traditionally been performed in one of three settings; hospital-based, free-standing ambulatory surgery centers; or office-based surgical facilities. The advantages of office-based surgical facilities include greater control over the schedule, greater privacy for the patient, convenience for the patient and surgeon, and increased efficiency and consistency in nursing staff and support personnel.

This potential for convenience and economic gain resulted in a dramatic increase in outpatient surgery centers in the United States. Between 1989 and 1990 office-based surgery increased threefold to 1.2 million procedures per year. Current estimates suggest four out of every five operative procedures will be performed in outpatient facilities by the year 2005, and that one-quarter will be performed in a doctor's office. This is up 25% since 1998, yet fewer than a dozen states have addressed guidelines and regulations to provide for safety in the area.¹

This dramatic increase in outpatient surgical procedures has prompted research into the safety of these office-based facilities. Unfortunately there is little scientific literature on patient safety in ambulatory surgery- most of which was done at a hospital-based ambulatory surgical center. Therefore the majority of safety issues and protocol development has stemmed from this hospital-based ambulatory setting.

The choice of anesthesia for most plastic surgery procedures has been between IV conscious sedation with local anesthesia or general anesthesia. Safety and efficacy using IV conscious sedation has been demonstrated in multiple studies.^{2,3,4,5} This was appealing largely to plastic surgeons working in their office-based facility and obviated the need to have expensive equipment for general anesthesia. In an effort to validate the safety of general anesthesia in an office-based surgical facility Hoefflin et al reported on 23,000 consecutive cases over an 18-year period⁶. This is a detailed account of their policies and procedures in which general anesthesia was used on all patients with no deaths and minimal morbidity. The authors address the advantages of general anesthesia over IV sedation and include:

(1) better control of the airway; **(2)** the surgeon's ability to focus on the procedure rather than monitoring the level of anesthesia; and **(3)** elimination of variability in level of consciousness seen with IV sedation.

In order to police its own physicians and enhance patient safety three leadership organizations have proactively developed guidelines for outpatient facilities. The American Society of Plastic Surgeons (ASPS), the American Society for Aesthetic Plastic Surgery (ASAPS), and the American Society of Anesthesiologists (ASA) have provided state boards with these recommendations. In October 1999 the ASA House of Delegates approved "Guidelines for Office-Based Anesthesia" providing guidelines focused on the delivery of safe anesthesia care in outpatient facilities by anesthesiologists and certified registered nurse anesthetists.⁷ For those surgeons and anesthesiologists interested in setting up and maintaining a safe office-based surgery environment, the ASA Task Force on Office-Based Anesthesia has created a manual to provide practical advice.⁸

The ASPS and ASAPS took an unprecedented stance by mandating that all outpatient plastic and cosmetic surgery must be done in an accredited facility. Only those cases using minor local anesthesia and/or minimal oral tranquilization are potentially exempt. Beginning in June 1999 and ending July 2002 all ASPS and ASAPS members must transition to perform outpatient surgeries in accredited and/or licensed facilities that meet at least one of the following criteria:^{8,9}

1. Be accredited by a national or state recognized accrediting agency/organization such as the American Association for Accreditation for Ambulatory Surgery Facilities (AAAASF), Accreditation Association for Ambulatory Health Care (AAAHC), or the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO).
2. Be certified to participate in the Medicare program under Title XVII.
3. Be licensed by the state in which the facility is located.
Furthermore both the ASPS and ASAPS endorse updating and maintaining accreditation by passing inspections that are reported to state agencies.⁹ The nursing staff should maintain their credentials and certification in advanced cardiac life support (ACLS). Emergency equipment should also be on hand such as crash carts and oxygen supplementation.

Morello et al reviewed a survey to address patient safety in accredited outpatient surgical facilities. In this study the American Association for Accreditation of Ambulatory Surgery Facilities (AAAASF) sent a questionnaire to its 418 accredited facilities. The response rate was 57.7% and detailed operative deaths, the rate of surgical and anesthetic complications, as well as returns to the operating room and necessity for hospitalization.⁵ The favorable outcomes have continued to foster the development of outpatient surgical facilities.

A retrospective review was performed of 5316 consecutive cases that were completed between 1995-2000 at Dallas Day Surgical Center (DDSC)- an outpatient surgical facility. The purpose of this study was to determine how outcomes are adversely affected by board certified plastic surgeons performing procedures in an accredited outpatient surgical center.

Methods:

5316 cases were retrospectively reviewed between the years 1995-2000. All cases were performed by one of six board-certified plastic surgeons at the Dallas Day Surgical Center. The vast majority were cosmetic procedures including: blepharoplasty, brow lift, rhytidectomy, liposuction (including large volume liposuction), rhinoplasty, breast augmentation and mastopexy, and laser resurfacing. One surgeon (HHO) did exclusively elective hand and upper extremity cases. Multiple procedures were performed on some patients, but the overall case number (5316) does not reflect multiple procedures.

All cases were analyzed for any potential morbidity or mortality. Complications requiring return to the operating room were determined as were infection rates. Events leading to inpatient hospitalization at a nearby hospital were also included.

Results:

A retrospective review was performed on the 5316 cases that were done from 1995-2000 at Dallas Day Surgical Center- an outpatient surgical facility. There were no deaths. Cases were categorized according to the type of procedure performed; the vast majority of which were cosmetic procedures ([Table 1](#)). Approximately 10% of the procedures performed were combination procedures involving separate and distinct surgeries, i.e. breast augmentation and liposuction, abdominoplasty and liposuction, rhinoplasty and rhytidectomy, etc. ([Table 2](#)).

In this 6-year period there were 35 complications (0.6%) requiring a return to the operating room. The overwhelming majority of these were related to hematoma following rhytidectomy (27/35) ([Table 4](#)). There were six postoperative infections requiring incision and drainage. One patient returned to the operating room to repair a dehiscence following an abdominoplasty, and another patient had one procedure left off at the time of the original operation that was completed the following day.

Most patients postoperatively were transferred from the outpatient surgical center post anesthesia care unit (PACU) to a nearby hotel staffed with a full-time registered nurse. Seven patients necessitated inpatient hospitalization following their procedure. While in the PACU four patients developed an arrhythmia two patients had chest pain, and one patient had an air embolism postoperatively which required cardiac monitoring and transfer to a nearby inpatient hospital. Three patients developed a complication at the hotel requiring transfer to an inpatient facility. There were two pulmonary emboli following liposuction and one patient had a seizure ([Table 3](#)).

The postoperative infection rate was 0.52% (0.23-0.85%) in this six-year period. A review of previous studies allows some comparisons to be made regarding commonly recorded outcomes and complications. It is worth mentioning that our series involved 5316 consecutive cases and unlike either the Morello or Natof study this was not a survey. Absolutely all complications and morbidities from our series were listed and accurately reported ([Table 5](#))^{5,10,11}

Discussion:

The delivery of health care has increased in complexity. Technology has allowed many procedures to be performed in an office-based surgical facility, which before would have been done in a traditional hospital operating room. The advantages of office-based surgery benefit both the patient and the surgeon. Continued focus on safety is a primary concern and the following guidelines should continue to foster this safe environment. Patient safety must take precedence over cost and convenience. Any monetary savings or time gained is quickly lost if safety is compromised and complications are incurred.

One of the obvious advantages to performing surgery at outpatient surgical facilities is the convenience and comfort of the patient. A concerted effort is made to reduce patient anxiety both before the day of the procedure and on the day of surgery itself. Both an operating room nurse as well as the anesthesia personnel who will be administering their anesthetic routinely contacts the patient. All procedures are explained and any concerns

are addressed. Questions regarding medical history, medications, allergies, and any comorbidities are once again addressed. On the morning of the surgery all patients are admitted to a hotel room adjacent to the surgical suites. In an unhurried manner the patient is allowed to change into a provided robe and once again meets with one of the operating room nurses where a final medical history is completed. The anesthesiologist or CRNA then too meets with the patient to discuss any last minute questions. Patients are reassured that they will be completely comfortable during and immediately after their procedure and that every effort will be taken to assure their safety and optimal result. Means to decrease postoperative nausea are also conveyed to the patient, and mild sedation is begun after meeting with their plastic surgeon. Any markings are performed by the plastic surgeons at this time, as is the completion of the physical exam. The patient is then escorted to the operating suite and steps are taken to assure their comfort- particularly by warming the room and providing warm blankets.

The importance of a complete medical history cannot be overemphasized. All patients should have a thorough medical history taken inclusive of appropriate laboratory tests and a physical examination. This is the best way to recognize and anticipate any potential medical problems that may exist and then deal with them appropriately. Patient history should include personal health issues as well as social and family history. One must identify potential co-morbidities. An allergy to medication and the patient's prescribed and non-prescribed medications should be addressed. Continuation or cessation of these medications is based on their necessity in accordance with the procedure to be performed. The physical exam should begin with the patient's overall appearance and general health, and include their height, weight and vital signs. Chest and heart auscultation should be performed in addition to the related anatomic areas pertaining to the surgery. All labs, EKG, and CXRs should be ordered in accordance with the patient and scheduled procedure. Processing the above findings, the most appropriate facility can then be chosen for this particular patient. Any unresolved health issues should lead to postponement and/or cancellation of the procedure. This stratification and identification of co-morbidities has allowed for higher risk patients to have their procedure in an inpatient facility.

Anesthesia must be delivered by a skilled licensed professional, either an anesthesiologist or a certified registered nurse anesthetist (CRNA). The type of anesthesia should be decided in conjunction with the surgeon.

Each case should be individualized based on the magnitude of the operation and medical condition of the patient. Inpatient surgery or postoperative monitoring in an accredited facility should be considered for cases involving -prolonged anesthesia, combined procedures, or large-volume liposuction. No good data exists to exclude any specific procedures from outpatient surgical facilities. Potential blood loss, fluid and electrolyte shifts, postoperative pain, and extent of dissection should be considered when choosing the appropriate facility. Any procedure on an average size adult with greater than 500cc of expected blood loss should be done in a facility which has readily available blood and blood products.

The combination of multiple plastic surgery procedures during a single surgery has the potential to increase complications. Though many combination procedures are routinely

performed in outpatient facilities, controversy exists for many of these. Any presumed benefit of simultaneous surgeries must be weighed against the potential for adverse effects. In the review of our cases 10.2% were combined procedures and no adverse outcomes were attributed to performing more than one procedure.

A surgeon must have access and staff privileges at a nearby hospital to perform any procedure he is contemplating doing at an outpatient facility. All types of surgical emergencies and potential situations should be addressed before they occur, and specific policies should be in place.

Medical records should be kept and include medical history, informed consent, and details of the operative procedure- both surgical and anesthetic. Documentation should be similar to any procedure performed in a traditional hospital-based operating facility. Accurate record keeping is paramount to patient safety. In our study several infections were traced to a particular employee in a specific time period. This information resulted in the termination of that employee and the infection rate subsequently decreased. Medical records are perhaps one of the more under appreciated means to monitor patient safety.

Properly informing patients regarding pre and postoperative expectations and care can alleviate anxiety and enhance outcomes. Patient education should be uniform and specific to the procedure being performed, and a routine part of every surgical procedure.

Hiring well-trained and qualified nurses and anesthesia personnel is crucial to a viable outpatient surgical center. It is our opinion that by having direct control over the nursing staff working in our surgical center, we are able to more consistently provide quality care to our patients. Familiarity of our nurses not only to the procedures and routines as well as the nuances of each plastic surgeon allows for a more consistent work environment. The familiarity also translates to the comfort of our patients as our nurses are able to accurately and positively answer all questions that may arise. Experienced surgical nurses as well as recovery room nurses further enhance patients' safety. Maintenance of advanced cardiac life support credentials and fulfilling continuing medical education is essential to patient safety.

All operating room equipment must be up to date and replaced as necessary. Moreover backup support for vital equipment failures should be instituted such as anesthesia equipment and oxygen delivery system. Current standards of care should also be in place to include humidifiers, oximeters, capnography, warming blankets, and pneumatics/compression leg garments.

Periodic evaluation and review of performed procedures should assess the surgical team's performance. This should include surgeons, anesthesia personnel, and nurses. Dialog should be encouraged and potential or recurrent problems addressed. Again the role of accurate medical records is invaluable to objective assessments of performance and to assess patient safety.

The convenience and potential cost savings of outpatient surgical facilities are ultimately only successful if the patients' safety is preserved. The safety profile of the outpatient facility must meet and/or exceed that of the traditional hospital-based or ambulatory care

facility. We have reviewed our experience over the last 6 years in which there were few complications and no deaths. We continue to support the judicious use of accredited outpatient plastic surgery facilities by board certified plastic surgeons in the management of plastic surgery patients.

Table 1

Type of Procedure	Relative Percentage of Total Cases Performed
Rhytidectomy, Browlift, Blepharoplasty, and/or Neck lift	26.2%
Breast Augmentation, Implant exchange, and/or Capsulotomy	15.1%
Hand and Upper Extremity	14.3%
Liposuction	11.5%
Laser Resurfacing and/or Dermabrasion	10.4%
Rhinoplasty	8.7%
Head and Neck Reconstruction	6.8%
Liposuction and Abdominoplasty	2.2%
Rhinoplasty and Rhytidectomy	2%
Liposuction and Breast Augmentation	1.8%
Abdominoplasty	0.7%
Otoplasty	0.6%

Table 2

Total Number of Cases Performed	5316
Combination Procedures performed	10.2%

Table 3

	Unscheduled return to OR	Complication of Anesthesia	Transfer to Hospital	Post-op Infections	Total Cases
1995	3	3	0	5	844
1996	3	0	3	2	826
1997	4	0	1	4	862
1998	4	0	0	5	900
1999	5	0	0	4	927
2000	16	0	0	8	941

Table 4

Complications Return to OR	Total Number of Cases
Hematoma	27
Infection	6
Dehiscence	1
Left off Procedure	1

Table 5

	DDSC	Morello et a	l Natof
Hematoma	0.5%	0.24%	0.55%
Infection	0.11%	0.09%	0.07%
Return to OR	0.66%	0.13%	NR
Precautionary Hospitalization	0.13%	0.03%	0.12%

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