

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

H. Steve Byrd, M.D., Fritz E. Barton, M.D., Harry H. Orenstein, M.D., Rod J. Rohrich, M.D.,
A. Jay Burns, M.D., P. Craig Hobar, M.D., and M. Scott Haydon, M.D.

Dallas, Texas

Advances in medicine have improved the delivery of health care, making it more technologically superior than ever and, at the same time, more complex. Nowhere is this more evident than in the surgical arena. Plastic surgeons are able to perform procedures safely in office-based facilities that were once reserved only for hospital operating rooms or ambulatory surgery centers. Performing procedures in the office is a convenience to both the surgeon and the patient. Some groups have challenged that performing plastic surgery procedures in an office-based facility compromises patient safety. Our study was done to determine whether outcomes are adversely affected by performing plastic surgery procedures in an accredited outpatient surgical center.

A retrospective review was performed on 5316 consecutive cases completed between 1995 and 2000 at Dallas Day Surgical Center, Dallas, Texas, an outpatient surgical facility. Most 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. During this 6-year period, 35 complications (0.7 percent) and no deaths were reported. Most complications were secondary to hematoma formation (77 percent). The postoperative infection rate for patients requiring a return to the operating room was 0.11 percent. Seven patients required inpatient hospitalization following their procedure secondary to arrhythmias, angina, and pulmonary emboli. 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 even exceed that of the traditional hospital-based or ambulatory care facility. After reviewing our experience over the last 6 years that indicated 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. (*Plast. Reconstr. Surg.* 112: 636, 2003.)

Plastic surgeons have performed operative procedures in their offices for years. As new techniques and technologies have increased the number of procedures available, those being performed in offices have expanded as well. Previously, many of the more complex procedures were not performed in outpatient settings, primarily because of the limitations of anesthesia. Intravenous conscious sedation with appropriate monitoring has allowed more cases to be performed in facilities other than a traditional hospital setting. Furthermore, advances in the technology of anesthesia monitoring have made it possible to duplicate traditional hospital operating room equipment in outpatient facilities. Performing procedures once considered inpatient only in an office-based setting has afforded plastic surgeons and their patients a convenience that was previously not available.

The delivery of outpatient surgical services has traditionally been performed in one of three settings: the hospital, a free-standing ambulatory surgery center, or an office-based surgical facility. 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.

From the Department of Plastic Surgery, University of Texas Southwestern Medical Center. Received for publication May 13, 2002; revised June 24, 2002.

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Between 1989 and 1990, the number of office-based surgical procedures increased threefold to 1.2 million procedures per year. Current estimates suggest four of every five operative procedures will be performed in outpatient facilities by the year 2005, and that one fourth of those will be performed in a doctor's office. This is up 25 percent since 1998, yet fewer than a dozen states have addressed guidelines and regulations to provide for safety in this area.¹

This dramatic increase in outpatient surgical procedures has prompted research into the safety of office-based facilities. Little scientific literature exists, however, on patient safety in ambulatory surgery centers. Until now, most outpatient surgery was performed at a hospital-based ambulatory surgical center; therefore, most safety issues and protocol development have stemmed from this hospital-based ambulatory setting.

The choice of anesthesia for most plastic surgery procedures has been between intravenous conscious sedation with local anesthesia and general anesthesia. The safety and efficacy of using intravenous conscious sedation have been demonstrated in multiple studies.²⁻⁵ This method was largely appealing 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.⁶ reported on 23,000 consecutive cases over an 18-year period. Their report is a detailed account of 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 intravenous sedation, which include (1) better control of the airway; (2) the surgeon's ability to focus on the procedure rather than on monitoring the level of anesthesia; and (3) elimination of variability in level of consciousness seen with intravenous sedation.

To police their 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 their recommendations.⁷ In October of 1999, the American Society of Anesthesiologists' House of Delegates approved *ASA Standards, Guidelines, and*

Statements, focused on the delivery of safe anesthesia care in outpatient facilities by anesthesiologists and certified registered nurse anesthetists.⁸ For those surgeons and anesthesiologists interested in setting up and maintaining a safe, office-based surgery environment, the American Society of Anesthesiologists' Task Force on Office-Based Anesthesia has created a manual to provide practical advice.⁹

In 1999, the American Society of Plastic Surgeons and the American Society for Aesthetic Plastic Surgery took an unprecedented stance in mandating that, by July of 2002, all members had to perform outpatient plastic and cosmetic surgery in an accredited facility. Only those cases using minor local anesthesia or minimal oral tranquilization are exempt. Accredited or licensed outpatient surgical facilities must meet at least one of the following criteria⁷:

1. Be accredited by a nationally recognized or state-recognized accrediting agency or organization, such as the American Association for Accreditation of Ambulatory Surgery Facilities, Accreditation Association for Ambulatory Health Care, or the Joint Commission on the Accreditation of Healthcare Organizations.
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 American Society of Plastic Surgeons and the American Society for Aesthetic Plastic Surgery endorse updating and maintaining accreditation by passing inspections that are reported to state agencies.⁷ The nursing staff should maintain credentials and certification in advanced cardiac life support. Emergency equipment (e.g., crash carts and oxygen supplementation) should also be on hand.

Morello et al.² reviewed a survey to address patient safety in accredited outpatient surgical facilities. In this study, the American Association for Accreditation of Ambulatory Surgery Facilities sent a questionnaire to its 418 accredited facilities. The response rate was 57.7 percent and detailed the rate of surgical and anesthetic complications, including deaths, returns to the operating room, and necessity for hospitalization.⁵ The favorable outcomes from this survey have continued to foster the development of outpatient surgical facilities.

METHODS

Between the years 1995 and 2000, 5316 cases were retrospectively reviewed. This study was conducted to determine whether outcomes are adversely affected by board-certified plastic surgeons performing procedures in an accredited outpatient surgical center.

All cases were performed by one of six board-certified plastic surgeons at Dallas Day Surgery Center. Most were cosmetic procedures, including blepharoplasty, brow lift, rhytidectomy, liposuction (including large volume liposuction), rhinoplasty, breast augmentation, mastopexy, and laser resurfacing. One surgeon performed elective hand and upper-extremity surgery exclusively. Multiple procedures were performed on some patients, but the overall number of cases (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

Among the 5316 cases reviewed, there were no deaths. Cases were categorized according to the type of procedure performed; most were cosmetic procedures (Table I). Approximately 10 percent of the procedures performed were combination procedures involving separate and distinct operations (i.e., breast augmentation and liposuction; abdominoplasty; and liposuction, rhinoplasty, and rhytidectomy).

In this 6-year period, 35 complications (0.7

percent) required a return to the operating room. The overwhelming majority of these complications were related to hematoma following rhytidectomy (27 of 35) (Table II). Six postoperative infections required incision and drainage. One patient returned to the operating room for repair of 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.

Postoperatively, most patients were transferred from the outpatient surgical center's postanesthesia care unit to a nearby hotel staffed with a full-time registered nurse. Seven patients needed inpatient hospitalization following their procedure. While in the postanesthesia care unit, four patients developed an arrhythmia, two patients had chest pain, and one patient had an air embolism that required cardiac monitoring and transfer to a nearby inpatient hospital. Three patients developed a complication at the hotel requiring transfer to an inpatient facility. Two pulmonary emboli occurred following liposuction and one patient had a seizure (Table III). The postoperative infection rate was 0.52 percent (range, 0.23 to 0.85 percent) in this 6-year period.

A review of previous studies allows some comparisons to be made regarding frequently recorded outcomes and complications. It is worth mentioning that our series involved 5316 *consecutive* cases, and unlike the Morello et al.² and Natof¹⁰ studies, this was not a survey. All complications and morbidities from our series were listed and accurately reported^{5,10,11} (Table IV).

DISCUSSION

The delivery of health care continues to increase in complexity; however, new technology has allowed many procedures to be performed in an office-based surgical facility that previously would have been done in a traditional hospital operating room. The advantages of

TABLE I
Types of Procedures

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 II
Complications

Complications with Return to Operating Room	Total No. of Cases
Hematoma	27
Infection	6
Dehiscence	1
Left off procedure	1

TABLE III
Complications from 1995 to 2000

	Unscheduled Return to Operating Room	Complication of Anesthesia	Transfer to Hospital	Postoperative Infections	Total No. of Cases
1995	3	3	0	5	844
1996	3	0	3	2	842
1997	4	0	1	4	862
1998	4	0	0	5	900
1999	5	0	0	4	927
2000	16	0	0	8	941

office-based surgery benefit both the patient and the surgeon, but 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. Continued focus on safety is a primary concern. The following guidelines should continue to foster a safe environment.

One of the obvious advantages to performing surgical procedures in outpatient surgical facilities is the convenience and comfort of the patient. Efforts are made to reduce patient anxiety before the day of the procedure itself. The operating room nurse and the anesthesia personnel routinely contact the patient to explain procedures and answer any questions. Medical history, medications, allergies, and comorbidities are discussed. On the morning of the procedure, patients are admitted to a hotel room adjacent to the surgical suites. In an unhurried manner, patients are allowed to change into a robe and meet with an operating room nurse; a medical history is completed. The anesthesiologist or certified registered nurse anesthetist meets with the patient to answer 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 ensure their safety and optimal result. Methods used to decrease postoperative nausea are also explained. The patient meets with the plastic surgeon, who will complete the physical examination and mark the patient. Mild sedation is begun and the patient is escorted to the oper-

ating suite. Warm blankets and a warm room help comfort and assure the patient.

The importance of a complete medical history cannot be overemphasized. A thorough medical history should be taken for each patient and should include personal health issues and comorbidities, as well as social and family history. Any allergies to medication and the patient's prescribed and nonprescribed medications should be noted. Continuing or stopping any medications is based on the procedure to be performed.

The physical examination should begin with the patient's overall appearance and general health and should include the patient's height, weight, and vital signs. Chest and heart auscultation should be performed. Anatomic areas involved in the scheduled surgical procedure should be examined carefully. Appropriate laboratory tests, electrocardiograms, and chest radiographs should be ordered with the patient's convenience in mind. The surgeon can now recognize any potential medical problems that exist and deal with them appropriately. After all results are processed, the most appropriate facility can be chosen for the patient. Proper identification of comorbidities can often send higher-risk patients to an inpatient facility. Unresolved health issues can lead to postponement or cancellation of the procedure altogether.

Anesthesia must be delivered by an anesthesiologist or a skilled and licensed professional certified registered nurse anesthetist. The type

TABLE IV
Morbidities

	Dallas Day Surgery Center (this study)	Morello et al. ²	Natofl ⁹
Hematoma	0.5%	0.24%	0.55%
Infection	0.11%	0.09%	0.07%
Return to operating room	0.66%	0.13%	Not reported
Precautionary hospitalization	0.13%	0.03%	0.12%

of anesthesia should be decided on in conjunction with the surgeon.

Each case should be individualized, based on the magnitude of the operation and the 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 exist 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 performed on an average-size adult with more than 500 cc of expected blood loss should be performed in a facility that has blood and blood products readily available.

The combination of multiple plastic surgery procedures during a single operation has the potential to increase complications. Although many combination procedures are routinely performed in outpatient facilities, controversy exists for many of these. Any presumed benefit of simultaneous operations must be weighed against the potential for adverse effects. In the review of our cases, 10.2 percent were combined procedures, and no adverse outcomes were attributed to performing more than one procedure.

A surgeon must have staff privileges at a nearby hospital and be credentialed to perform any procedure being contemplated 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 to deal with any contingency.

Medical records, including medical history, informed consent, and details of the operative procedure, both surgical and anesthetic, should be kept. Documentation should be similar to that for 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 underappreciated means to monitor patient safety.

Properly informing patients about preoperative 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. We believe that by having direct control over the nursing staff working in our surgery center, we can more consistently provide quality care to our patients. Familiarity of our nurses with the procedures and routines as well as the nuances of each plastic surgeon allows for a more consistent work environment. This familiarity also translates into comfort for our patients, as our nurses are able to accurately and positively answer all questions that may arise. Experienced surgical and recovery room nurses further enhance patient safety. Maintenance of advanced cardiac life support credentials and fulfilling continuing medical education are essential to patient safety.

All operating room equipment must be up to date and in proper working condition. Backup support should be provided for failure of vital equipment (e.g., anesthesia equipment and oxygen delivery systems). Current standards of care should also be in place to include humidifiers, oximeters, capnography, warming blankets, and pneumatics or compression leg garments.

Periodic evaluation and review of performed procedures should assess the surgical team's performance. This evaluation 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 in objective assessments of performance and patient safety.

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

Rod J. Rohrich, M.D.
 Department of Plastic Surgery
 University of Texas Southwestern Medical Center
 5323 Harry Hines Boulevard, E7.210
 Dallas, Texas 75390-9132
 Rod.Rohrich@UTSouthwestern.edu

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