Nasal Reconstruction in the Elderly Patient
The Case for Not Letting Age Determine Method
Kevin A. Shumrick, MD; Andrew Campbell, MD; Ferdinand Becker, MD

Objectives: To review a series of nasal reconstructive procedures in elderly patients, and to discuss management issues related to reconstructing nasal defects in patients 80 years and older.

Design: Retrospective review identifying patients 80 years and older undergoing significant nasal reconstructive surgery.

Setting: University and private practice settings.

Patients: Patients 80 years and older requiring significant nasal reconstructive surgery, with nasal defect large enough to require a forehead flap for skin resurfacing. Patients whose defects were allowed to granulate or who had skin grafts were excluded.

Intervention: Nasal reconstructive surgery using advanced surgical techniques such as forehead flaps and cartilage grafts.

Main Outcome Measures: Complications related to surgery or use of anesthesia and whether patients believed the effort and resources required to complete the nasal reconstruction were worth it.

Results: Fifteen patients 80 years and older underwent nasal reconstructive surgery using forehead flaps. In addition, 5 patients had intranasal mucosal grafts and 6 had cartilage grafts. There were no instances of anesthetic or perioperative morbidity or mortality. In addition, all flaps completely survived, and results were judged as good to excellent.

Conclusions: Actuarial evidence shows that a 90-year-old American woman has a 40% chance of living to be 95 years old. Presently, with the improved level of functioning of octogenarians and nonagenarians, we are also concerned with their facial appearance, and want to use the optimum reconstructive technique. The decision of what type of reconstructive surgery to perform should not be based simply on a patient's age but must also take into account the patient's mental status and wishes, and medical condition. Our evidence supports the concept that, in the appropriately chosen patient 80 years and older, forehead flaps and cartilage grafting can be performed without significant morbidity.

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A MAJOR benefit of the industrial revolution has been a significant increase in the life span of the average person in all the major industrialized nations. Although Americans younger than 65 years have a higher mortality rate than citizens of many European countries and Japan, between ages 65 and 80 years, the difference diminishes. In fact, after age 80 years, life expectancy is greater in the United States than it is in Sweden, France, England, or Japan.1

Coincident with this increase in life span is an increase in age-related diseases. Skin cancer shows a distinct relationship between age and ionizing radiation exposure. The most commonly affected region of the body is the face, with the most commonly affected site being the nose. Given the prevalent attitudes toward trying to obtain deep tans and a population that is living longer, a coincident increase in the incidence of all types of skin cancer, with a distinct increase in facial and nasal carcinomas, is not surprising.

Although there is little question regarding the appropriateness of removing nasal carcinomas, there have been concerns regarding what lengths should be taken to reconstruct nasal defects in elderly patients. The question of modifying the surgical management of elderly patients solely on the basis of age is not new and extends from the early days of surgery. In the early portion of this century, there were several articles2,3 detailing unacceptably high mortality rates in elderly...
MATERIALS AND METHODS

The patient series portion of this article consists of a retrospective review of our practices during the past 10 years, specifically, to identify elderly patients who underwent major nasal reconstructive surgery. For our purposes, “elderly” was considered to be older than 80 years. To qualify as a major reconstruction, the patient had to have had at least a regional flap (cheek advancement, nasolabial, or forehead flap) performed. Often, there were associated mucosal grafts and cartilage grafts. Patients with only local cutaneous flaps or skin grafts were excluded.

The patient series was analyzed with regard to age, defect, reconstructive method, perioperative complications, and outcome.

patients for even relatively minor procedures. This prompted a surgeon to state that “elective hernia repair should not be performed on patients over the age of 50.”4 Review of these articles shows that they were all written early in the century, before modern-day anesthetic and surgical techniques were available. Recent literature2,5 shows that surgical mortality and morbidity in elderly patients has been steadily dropping during the past 60 years. Katlic6 even described a series of surgical patients older than 100 years who underwent a variety of procedures (6 patients had multiple procedures) with no perioperative mortality and low morbidity.

An additional reason cited for not performing the best possible nasal reconstructive surgery in elderly patients is that they are “old” and do not have very long to live. However, actuarial data show that, at present, the 5-year survival rates for 80-year-old American women and men are 72% and 59%, respectively. For 90-year-old American women and men, the expected 5-year survival rates are 49.3% and 30.0%, respectively. Individuals who have survived past 80 years should not be thought of as “on their way out” (Table and Figure 1).

As the elderly population increases, the facial reconstructive surgeon will inevitably be confronted with increasing numbers of elderly patients with nasal defects, and will have the delicate task of recommending (and performing) nasal reconstructive surgery that is appropriate for the patient’s psyche and physiologic status. A common misconception is that elderly patients are not concerned with their appearance, and would not fully appreciate the aesthetic difference between a major reconstructive effort and a compromised attempt. We found that many elderly patients are conscious of their physical appearance and wish to look as normal as possible. The fact is that many very elderly patients live in group situations and infrequently see family or previous friends. In these situations, where the forgiving eye of a family member or long acquaintance is not present, physical appearance is a major concern with regard to the socialization of the elderly patient.

RESULTS

Fifteen patients aged 80 years and older (range, 80-98 years; mean, 87 years) who underwent major nasal reconstructive surgery were identified. The following reconstructive procedures were performed: 2 nasolabial flaps, 12 paramedian forehead flaps, 3 cheek advancement flaps, 1 radial forearm free flap, 6 coincident nasal mucosal flaps with cartilage grafts, and 1 split cranial bone graft (Figure 2 and Figure 3).

There were no perioperative deaths and only 1 perioperative complication (a bleeding gastric ulcer, which required an additional 4 days of hospitalization). The aesthetic results were all judged as good to excellent by

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<th>Age, y</th>
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*Data from Manton and Vaupel.1

Figure 1. Survival rates for men and women in the United States after age 80 years. Although US mortality rates for younger individuals are greater in the United States than in the other 4 countries listed, their survival rate after age 80 years is the highest.1

The purpose of this article is to detail our experience with nasal reconstructive surgery in the elderly patient, and to offer insights into managing this difficult problem.

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As can be seen from the patient series, it is possible to perform major reconstructive procedures (even total nasal reconstructions) on elderly patients with no mortality and minimal morbidity. However, this is not to say that every elderly patient with a nasal defect should undergo the definitive “criterion standard” nasal repair. The surgeon must consider the patient’s physical and mental status, and design a surgical plan appropriate to each patient’s unique situation. A major decision-making concern in the elderly patient is mental status. For practical purposes, a nasal defect, although visually distressing, rarely represents a significant health threat to the patient. Therefore, a nasal reconstruction is basically an elective procedure, and the patient must be intimately involved in the decision-making process. We believe that, if a patient is incapable of participating in the decision-making process (because of dementia) or is unconcerned about his or her appearance, then complicated nasal reconstruction should not be undertaken, and the most expedient method of raw surface closure should be chosen (eg, skin graft, local flap, or granulation).

If it is decided that nasal reconstructive surgery is to be performed on an elderly patient, the key to avoiding perioperative complications is conscientious preoperative planning. The planning process should include not only the repair technique but should also seek to maximize the patient’s physiologic status.

Several instruments have been developed to facilitate the measurement of risk in a surgical patient. Of these, perhaps the most reliable are the Cardiac Risk Index and the more widely used American Society of Anesthesiologists Risk Classification. In practice, however, most surgeons do not use indexes, preferring the more pragmatic approach of total patient assessment. This is entirely reasonable as long as the assessment is done meticulously. No “score” can improve on decision making that is based on sound clinical judgment exercised after a thorough consultation. The key to a successful outcome lies in the prevention of operative and postoperative complications. Most of these preventive measures are identified and implemented before surgery. This is as important as attention to operative technique.

Obesity and smoking are easily identified major risk factors when combined with general anesthesia, and patients with these conditions should try to have their surgery performed under intravenous sedation. Hypertension is common in elderly patients and is associated with increased morbidity and mortality; its correction will improve outcome. In addition, preoperative control of diabetes will improve results.

Use of antihypertensive medication, in particular β-adrenergic blocking agents, should be continued up to and including the morning of surgery. Chronic hypokalemia is to be expected in patients taking diuretics and should be corrected.
INVASIVE INTRAOPERATIVE MONITORING

The rationale for undertaking invasive operative monitoring (eg, arterial lines and Swan-Ganz catheters) is that impaired cardiac function is often asymptomatic, and up to one third of operative deaths are caused by cardiac conditions. However, given the minor physiologic demands of nasal reconstructive surgery (as opposed to abdominal or thoracic surgery), if a patient is so compromised that invasive monitoring is believed to be necessary, then the surgeon might wish to reconsider the suitability of the patient as a candidate for major nasal reconstructive surgery.

PREOPERATIVE RECONSTRUCTIVE PLANNING

Although every patient undergoing major nasal reconstructive surgery deserves thorough preoperative planning, it is critically important in the elderly patient. Meticulous preoperative planning can save significant intraoperative time. Every aspect of reconstruction should be assessed before surgery, with a surgical plan formulated and contingency plans decided upon for each major step. If a foil template of the defect is to be used to design a reconstructive flap, the template should be designed and cut in the office, then taken to the operating room. This simple step can save significant operative time. If there is the possibility of using cartilage grafts or skin grafts, the donor sites should be prepared at the beginning of the procedure to avoid the additional time involved in readying these sites during surgery. Additional time can be saved by having a second surgeon harvesting skin grafts or auricular cartilage grafts.

INTRAOPERATIVE TECHNIQUE

The golden rule for nasal reconstructive surgery in the elderly is to “keep it simple.” The art of surgery in the aged is to be swift and gentle. The surgeon must have the reconstructive plan firmly in mind, and perform it without excessive “waffling” about minor issues. Some measures are easily forgotten. As in pediatric operations, the patient must be kept warm. This means raising the temperature in the operating room and covering the patient with warming blankets.

Whenever possible, we prefer to perform nasal reconstructive surgery in the elderly under intravenous sedation, with local 1% lidocaine with 1:100 000 epinephrine injected at the operative site. The sedation is given as a continuous low-dose infusion of a short-acting agent such as propofol with boluses at painful points (such as local anesthetic injection). Oxygen is administered through a 10F red rubber catheter, which is threaded through the nose into the nasopharynx. Using this anesthetic technique allows for major nasal reconstructive procedures to be performed with minimal physiologic risk. At the end of the procedure, when the propofol infusion is discontinued, the patient wakes up rapidly with little residual drug effect. If extensive intranasal work is to be performed, or the procedure is expected to take longer than 4 hours, then general anesthesia is preferred.

Figure 3. A, B, and C, An 88-year-old woman with an extensive full-thickness defect of the inferior two thirds of the nose underwent reconstructive surgery with bilateral intranasal mucosal flaps, bilateral auricular conchal cartilage grafts, and a paramedian forehead flap. A general anesthetic was used. D, A postoperative photograph at 1 year after division of the forehead flap pedicle.
Regardless of the type of anesthesia, it is important to keep intravenous fluid intake to a minimum to avoid fluid overload and the need for Foley catheters.

**POSTOPERATIVE CARE**

Beware of total bed rest in the elderly patient. We believe it is important to specifically avoid having patients lie immobile for a day or two after an operation. Patients are encouraged to be out of bed and in a chair or, if possible, walking the evening after the operation. Typically, we have patients come in as outpatients, keep them in the hospital overnight for observation, and discharge them the following day.

Fluid balance is more difficult in elderly patients because of reduced hemodynamic reserves and renal function and poor tolerance for fluctuations. Urinary retention and urinary tract infections are common after any surgery, and are aggravated by Foley catheters. Therefore, we avoid using indwelling bladder catheters when possible. If a patient develops urinary retention, a traumatic straight catheterization is performed until resolution of the problem.

Narcotics for pain control should be given to elderly patients in smaller doses and at more frequent intervals. Nasal reconstructive surgery is typically not painful, and routine use of pain medications, without patient request, should be avoided. Regular medication use should be continued when possible. Great care is required in the use of tranquilizers because they can produce confusion rather than sedation, and certain histamine₂ blockers might also produce confusion. In addition, the stress of pain itself can produce confusion. Mental status changes in the elderly patient should be carefully monitored and treated appropriately.

In conclusion, with proper patient selection, planning, and surgical technique, major nasal reconstructive procedures can be performed safely, even in very elderly patients. The practice of denying patients nasal reconstructive surgery simply because of advanced age is an outdated concept that is refuted by this study and modern-day surgical literature. Patients who would not appreciate, or would be at significant risk from, major nasal reconstructive surgery are readily identified and treated with other modalities.

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**REFERENCES**


**Quotable**

A man, always studying one subject, will view the general affairs of the world through the colored prism of his own atmosphere.

*Benjamin Disraeli*