Safe and Effective Conscious Sedation Administered by Dermatologic Surgeons

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Objective: To review the experience with conscious sedation administered by dermatologic surgeons at an academic medical center.

Design: Retrospective medical chart review.

Setting: Outpatient dermatologic surgery unit at an academic medical center.

Patients: Fifty episodes of conscious sedation in 37 patients undergoing dermatologic surgical procedures.

Intervention: Intravenous and inhaled conscious sedation was administered with strict monitoring during procedures.

Main Outcome Measures: Efficacy was subjectively recorded by the administering physician and complications were recorded.

Results: Administration of conscious sedation by dermatologic surgeons was associated with good to excellent sedation with minimal complications. Extensive preparation and training were necessary, and strict guidelines devised by a conscious sedation task force were followed. Emergency preparedness was high, although it was not used.

Conclusions: Conscious sedation can be safely and effectively administered by dermatologic surgeons in a hospital-based outpatient surgical unit after extensive training. Emergency preparedness is essential, and conservative guidelines should be followed.

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Many procedures performed by dermatologic surgeons are painful. Local anesthesia provides excellent relief in most cases. However, several clinical scenarios exist in which adjuvant sedation proves beneficial for patients and surgeons alike. A prime indication is procedures in which extensive local anesthesia is necessary and is associated with the pain of numerous injections. Facial laser procedures can cause significant discomfort, either during the procedure or during the administration of extensive regional nerve blocks and local anesthesia. In addition, patients with significant anxiety, including apprehensive children, may benefit from the sedative and anxiolytic effects of conscious sedation.

Conscious sedation is defined as a medically controlled state of depressed consciousness in which patients retain their protective reflexes, maintain their airway independently, and respond to physical and verbal stimulation.1 Conscious sedation is intermediate in the spectrum of sedation, which ranges from anxiolysis and analgesia to general anesthesia. The key characteristics of conscious sedation are that it is of rapid onset, is titratable to an individual patient’s desired level of sedation, and is associated with significant depression of consciousness, relief of anxiety, and analgesia. Retrograde amnesia of any pain associated with procedures is an additional benefit of conscious sedation. The effects of the medications most commonly used for conscious sedation are reversible with pharmacological antagonists.

When performed in accord with established safety guidelines, conscious sedation has proven safe and effective in alleviating patient discomfort and anxiety.2,3 However, extensive training, specialized monitoring equipment, and dedicated nursing personnel are required for safe administration. Emergency preparedness is essential, as is current training in basic life support and advanced cardiac life support. Use of conscious sedation by the nonanesthesiologist is usually limited to American Society of Anesthesiologists (ASA) class I and II patients, who are healthy or who have only mild systemic disease.1

We review herein our experience with the administration of conscious sedation by dermatologic surgeons within a surgical dermatology unit at an academic medical center.
PATIENTS AND METHODS

We retrospectively reviewed 30 episodes of conscious sedation administered to 37 patients by dermatologic surgeons. Patients ranged in age from 4 to 76 years. The sedation of any patient presenting with an acute illness was postponed until the illness had resolved. Preoperative evaluation included review of medical, surgical, and anesthesia histories; medications; and allergies. Physical examination of all patients included cardiopulmonary and airway assessment. Only patients with stable comorbid medical conditions (ASA class I or II) received conscious sedation in the dermatology unit. All patients received verbal preoperative sedation instructions, and postsedation instructions were provided in written and verbal form to the patient and responsible chaperone. Patients were prohibited from driving until the day after sedation.

The clinical indications for the dermatologic surgical procedures included the management of skin cancer, benign cutaneous neoplasms, vascular malformations, aging face syndrome, warts and molluscum, acne scarring, keloid, androgenic alopecia, hidradenitis, angiofibromas of tuberous sclerosis, and benign familial pemphigus. Dermatologic surgical procedures performed included excisional surgery, cutaneous biopsy or extensive curettage, pulsed dye laser therapy, carbon dioxide laser resurfacing or ablation, and hair transplantation surgery.

Conscious sedation was administered in all cases in accord with guidelines recommended by our institutional pediatric and general conscious sedation task forces as well as with published guidelines. A registered nurse, dedicated solely to the monitoring and management of sedation, was with the patient from the beginning of the procedure until complete recovery. The patient's vital signs were continually monitored and documented, including blood pressure and pulse oximetry, and consciousness was assessed every 5 to 15 minutes. All patients were allowed to recover in the surgical room until they had achieved sufficient consciousness to pass standard discharge criteria and to be safely discharged in the care of a chaperone. Patients were advised against operating vehicles or hazardous machinery and making significant decisions for the remainder of the day.

The quality of sedation was graded on a subjective scale (excellent, good, fair, or poor) by the surgeons (C.C.O. and T.H.N.). Excellent sedation was associated with absent or minimal anxiety or discomfort; good, with mild anxiety or discomfort; fair, with moderate anxiety or discomfort; and poor, with anxiety or discomfort that appeared unmitigated by the sedation.

RESULTS

PROCEDURAL DETAILS

A variety of medication combinations, dosages, and routes were used, customized to the individual patient's needs. Representative sedation regimens included intravenous midazolam hydrochloride and fentanyl citrate, combination intravenous lorazepam and meperidine hydrochloride, and combination oral midazolam and nitrous oxide via nasal mask. Total medication dosages varied widely, depending on patient response. The following dosages are total dosages, often administered for an extended period. Dosage ranges were midazolam hydrochloride, 1 to 9.25 mg, fentanyl citrate, 100 to 500 µg, lorazepam, 1 to 4 mg, and meperidine hydrochloride, 37.5 to 175 mg, all intravenously; and 25% to 30% nitrous oxide via nasal mask with 7 L per minute of oxygen. In most cases, local anesthesia or regional nerve blocks were administered as well. In many cases, the conscious sedation was used in part to sedate the patient before administration of extensive local anesthesia by injection. Conscious sedation was also performed for its amnesic effect, which was significant with high doses of midazolam. All medications were administered in combination. Single-agent anxiolysis with benzodiazepines or narcotics was not considered conscious sedation.

The quality of conscious sedation was judged by the dermatologic surgeons (C.C.O. and T.H.N.) to be excellent in 43 cases, good in 5, and fair in 2. Intravenous combination sedation with midazolam and fentanyl was universally excellent, whereas sedation of pediatric patients with combination oral midazolam and inhaled nitrous oxide was helpful although less thoroughly sedating.

With regard to complications, 2 patients experienced mild to moderate nausea with the administration of nitrous oxide, none had vomiting, and no other patients experienced any identifiable complications. All transient hypoxic episodes were rapidly reversible with physical and verbal stimulation of the patient. There were no hypotensive episodes, and no respiratory or cardiopulmonary resuscitation was necessary. The administration of sedation did not result in complications associated with the primary surgical procedure in any case.

Patients expressed a high degree of satisfaction with their sedation, and, on follow-up visits, many reported a moderate degree of amnesia regarding their procedure.

PATIENT REPORTS

Patient 1

A 66-year-old woman with aging face syndrome presented for full-face carbon dioxide laser resurfacing. After preoperative evaluation and under continuous monitoring, the patient received intravenously 2 mg of midazolam hydrochloride and 100 µg of fentanyl citrate. Bilateral, supraorbital, infraorbital, and mental nerve blocks were placed, and the peripheral facial skin was anesthetized with 0.2% lidocaine hydrochloride with 1:500 000 epinephrine. Immediately before laser resurfacing, the patient's level of consciousness had returned to normal, and we administered 1 mg of midazolam hydrochloride and 50 µg of fentanyl citrate; the entire procedure was then performed. There were no complaints of discomfort. The patient was monitored until stable and was discharged in the care of a driver. Outcome was judged as excellent with no complications, and the patient was very pleased with the effect of the sedation.

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Patient 2

A 44-year-old woman with extensive facial telangiectases received pulsed dye laser therapy. After preoperative evaluation and under continuous monitoring, the patient received intravenously 2 mg of midazolam hydrochloride and 100 μg of fentanyl citrate, which provided an excellent level of sedation and allowed the patient to undergo the procedure with complete comfort. Outcome was judged as excellent with no complications, and the patient was very pleased with the sedation.

Patient 3

A 43-year-old man with androgenic alopecia presented for hair transplantation. After preoperative evaluation and with continuous monitoring, a total of 175 mg of meperidine hydrochloride and 4 mg of lorazepam was administered intravenously in divided doses. Local anesthesia with 0.5% lidocaine hydrochloride with 1:200,000 epinephrine was administered. The outcome was excellent, with no complications and a high degree of patient satisfaction.

Patient 4

A 5-year-old girl with a 4-cm changing congenital nevus presented for excisional surgery. After preoperative evaluation and with continuous monitoring, the patient received 15 mg of midazolam hydrochloride solution mixed in a grape drink. After 15 minutes, she became mildly sedated, and 45% nitrous oxide was administered via nasal mask. Local anesthesia was given without discomfort. The nitrous oxide was discontinued and the procedure was completed without complication. The patient and her parents were pleased with the effect of the sedation.

COMMENT

Conscious sedation is rapidly gaining acceptance as a humane and reliable method of reducing pain and anxiety in patients undergoing many types of medical procedures. It is now standard practice for patients undergoing gastrointestinal endoscopic procedures to receive conscious sedation to alleviate discomfort. Such sedation is currently administered by a range of medical practitioners, including anesthesiologists and nurse anesthetists as well as non–anesthesiology-trained physicians, with excellent safety profiles. Because of the potential for cardiorespiratory depression associated with administration of combinations of intravenous benzodiazepines and narcotics, emergency preparedness is essential when these medications are administered.

We underwent extensive training in preparation for administration of conscious sedation, including complete review of the literature and consultation with a conscious sedation task force and a pediatric intensive care anesthesiologist regarding optimal regimens for specific age groups and procedures. Certification in basic life support, advanced cardiac life support, and pediatric advanced life support was renewed. Practical observation of the administration of conscious sedation was obtained in other subspecialty areas. Established institutional guidelines for the safe administration of conscious sedation were followed. Our experience with the administration of conscious sedation by dermatologic surgeons indicates that this can be safely administered after extensive education and training and with appropriate precautions. We wish to emphasize that our approach to sedation is conservative, which likely explains the absence of significant complications. In fact, administration of oxygen was not necessary in any of our cases, whereas during our observational experience in other subspecialties, oxygen was noted to be administered periodically.

Conscious sedation was administered within a hospital-based outpatient surgical center with resuscitation equipment and intubation capabilities immediately available. Standards of care for administration of conscious sedation in the outpatient setting have been established and reviewed. The administration of conscious sedation should be restricted to facilities that are in compliance with these standards, which may exclude many office-based settings not specifically equipped for sedation.

The use of conscious sedation was satisfying for both patients and physicians, and our patients were pleased with its anxiolytic and analgesic effects. The responses of children were somewhat less predictable. Combination oral midazolam and inhaled nitrous oxide usually provided good sedation, but the sedation provided was not as intense or as uniform. There was clearly an optimal time after the administration of oral midazolam, generally 15 to 30 minutes, when anxiolysis was optimal and nitrous oxide was well received. The amnesia associated with conscious sedation was substantial and was appreciated by the patients.

Conscious sedation allowed us to administer local anesthesia and perform anxiety-provoking procedures without significant patient discomfort or distress. With adequate preparation, personnel, and monitoring equipment, conscious sedation administered by the dermatologic surgeon can be a useful, safe, and effective therapeutic modality. Extensive training and emergency preparedness, however, are essential.

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REFERENCES