Procedural Sedation in Oculofacial Surgery

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Staff

States, hospitals, and ambulatory surgery centers may have different credentialing and privileging requirements for those who administer sedative agents. The surgeon should be aware of these regulations. In general, only licensed independent practitioners such as medical doctors, dentists, registered nurses, physician assistants, or nurse practitioners who have undergone specific training are qualified to evaluate patients for and administer conscious sedation. They should be certified to give advanced life support and trained to rescue a patient who has lost protective reflexes from a deeper level of sedation. They should also be familiar with the pharmacology of the various sedative agents as well as reversal agents. In order to enhance patient safety, the person administering sedation and monitoring the patient for adverse events should not have any other responsibilities during the procedure. The surgeon should be free to fully concentrate on the technical aspects of the procedure.

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Risk factors for complications related to conscious sedation include poor cooperation; extremes of age; severe cardiac, pulmonary, hepatic, renal, or central nervous system disease; morbid obesity; sleep apnea; pregnancy; chemical dependence; history of difficult intubation; and inadequate spontaneous ventilation. Care of such patients should be handled instead by qualified anesthesia personnel.

Monitoring

A patient under sedation should be able to tolerate unpleasant stimuli while maintaining adequate cardiorespiratory function and the ability to respond purposefully to verbal or tactile commands. Monitoring is critical to ensure this goal is met throughout the procedure and recovery period. Baseline vital signs (heart rate, respiratory rate, blood pressure, and oxygen saturation) and level of consciousness should be assessed. They are reevaluated at specific intervals during surgery and should return to baseline prior to discharge. Despite return of baseline vitals and level of consciousness, effects of sedative agents can linger and impair coordination and alertness. Therefore, in no circumstance should a patient who has received sedative agents be sent home alone or allowed to drive for 24 h (American Society of Anesthesiologists 1996).

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Minimal Sedation

Oral benzodiazepines can provide good anxiolysis, relaxation, and amnesia. Cognitive function and coordination may be impaired, but cardiopulmonary function remains unaffected. Diazepam (Valium) is administered in 5–10-mg doses. It has a long half-life and active metabolites that can accumulate, especially in patients with poor renal function. Lorazepam (Ativan) is given in 1- or 2-mg doses. Its advantage is a somewhat shorter half-life than diazepam, and no active metabolites. Age, medical conditions, and drug clearance factors (renal or hepatic dysfunction) should be considered when dosing benzodiazepines (American Society of Anesthesiologists 1996).

Moderate Sedation

Typically intravenous opiates or benzodiazepines are used to achieve a state of depressed consciousness during which the patient can respond purposefully to verbal and tactile commands. Cardiopulmonary function may be slightly affected and require oxygen administration but should be maintained independently. Pulse oximetry and vital signs should be monitored every 15 min until recovery of baseline function. The combination of midazolam (Versed) and fentanyl is most commonly used for conscious sedation. Midazolam provides more profound amnesia and sedation than its oral benzodiazepine counterparts. It is given intravenously in 0.5-mg increments, not exceeding a total dose of 5 mg for young patients and 3 mg for patients older than 60 years (Shields 1997). It must be carefully titrated because the response may be unpredictable. This depends on hepatic acetylation and other medication use. Fentanyl crosses the blood–brain barrier more rapidly than any other opiate and therefore has a quick onset of action with excellent analgesia and sedation. It is given intravenously in 25-μg doses incrementally, with a maximal dose of 5 μg/kg (2 μg/kg in patients older than age 60 or debilitated patients) (Shields 1997). Administration should be slow to avoid skeletal muscle rigidity and impaired ventilation seen with rapid injection. For most conscious sedation procedures, these agents are administered solely for pain reduction during local anesthetic infiltration or nerve block. Once the surgical site is adequately anesthetized, there should be no need for continuous administration of sedative agents (American Society of Anesthesiologists 1996).

Antagonists/Reversal Agents

Occasionally, patients may need to be rescued pharmacologically from a deeper stage of sedation. Cardiopulmonary function needs to be supported in these stages. Reversal agents return the patient to a greater level of consciousness by directly competing for and displacing the agonist from its receptors. Flumazenil is a benzodiazepine antagonist given in 0.2-mg increments intravenously over 15 s. If the desired level of consciousness is not obtained after waiting 45 s, the same dose can be repeated once every minute for a total of 1 mg (O'Donnell et al. 2003). Naloxone is an opiate antagonist that must be used with extreme caution. Except for cases of life-threatening respiratory depression, naloxone should be given in very small doses (0.04 mg). It can be repeated every 2 min to titrate the reversal of opiate side effects (Burke and Dunwoody 1990). Larger doses can cause severe cardiovascular complications, including pulmonary edema, ventricular fibrillation, and death. Recurrent respiratory depression can occur due to the longer half-life of most agonist sedative agents. Therefore, patients must be monitored carefully for an extended period.

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