Case Report

Psychogenic Coma After Use of General Anesthesia for Ethmoidectomy

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Failure of a patient to awaken promptly after use of general anesthesia may be due to various causes, including medication-related effects, neurologic insults, or metabolic disturbances. Herein we describe a 49-year-old woman with a history of depression, for which she was receiving treatment, who did not awaken promptly after use of general anesthesia for ethmoidectomy. Results of neurologic examinations were normal, as were laboratory tests and radiologic studies. Six hours after completion of the operation, the patient spontaneously awakened. We hypothesize that she underwent a transient, self-limited period of dissociation related to unresolved grief due to the recent death of a family member.

In this report, we describe a 49-year-old woman who failed to awaken promptly after use of general anesthesia for ethmoidectomy. A psychologic disturbance was the likely cause.

REPORT OF CASE

A 49-year-old woman underwent a general medical examination and sought treatment of severe headaches and facial pain. During a 2-week period, she was assessed by members of the departments of internal medicine, neurology, psychiatry, gynecology, and otolaryngology. Results of laboratory and radiologic tests were unremarkable except for computed tomographic (CT) evidence of sinusitis, which was the presumptive cause of her severe headaches and facial pain. Ethmoidectomy was scheduled on an outpatient basis.

The patient’s medical history was remarkable for recurrent sinus infections treated with antibiotics, cervical myalgias, and distant pulmonary coccidioidomycosis. Her surgical history included appendectomy, thoracotomy and lung biopsy, partial hysterectomy, release of Dupuytren’s contracture, transfer of an ulnar nerve, face-lift, and breast augmentation; all these procedures were performed at institutions other than Mayo Clinic. Operative and anesthetic records of her care related to previous operations were unavailable. Her daily oral preoperative medications included estrogen; trazodone, 50 mg at bedtime; paroxetine, 20 mg for 4 weeks before the surgical procedure; and zolpidem, 2.5 mg at bedtime during the past year.

The patient underwent a psychiatric assessment because of recurrent depressive symptoms slightly worsened by the death of her stepson 6 months previously. These symptoms included apathy, social withdrawal, feelings of helplessness, lethargy, loss of appetite, insomnia, and weight loss. She had no suicidal ideation and had never attempted suicide. No psychosis was evident. At the time of her psychiatric assessment, she had been taking paroxetine, 20 mg daily at bedtime, for 2 weeks. She thought that her depressive symptoms were diminishing. She was instructed to consider psychotherapy and to adjust the dose of paroxetine by 10-mg increments if her depression did not continue to decrease.

On physical examination, the patient was 170 cm tall and weighed 55 kg. Her blood pressure was 100/70 mm Hg, and her heart rate was regular at 64 beats/min. Preoperatively, she was oriented, and her behavior was appropriate; however, she stated that she was anxious. She related that during three of her previous operations with use of general anesthetic agents, she had “awakened” during the middle of the procedure. She was unable to elaborate.
Preoperatively, a cannula was inserted intravenously (IV), and the patient was given midazolam, 6 mg IV in 1-mg increments, for 60 minutes. She received oxygen, 2 L/min, through the nasal cannula and was continuously monitored with pulse oximetry. Arterial oxygen saturation exceeded 95%. She was sedate yet easily arousable. She was able to move herself from the transportation cart to the operating room table without difficulty.

Anesthesia was induced with fentanyl, 100 μg IV, and propofol, 140 mg IV titrated until the patient lost consciousness. Intubation of the trachea was facilitated with rocuronium, 20 mg administered IV in divided doses. Anesthesia proceeded uneventfully. The patient's blood pressure ranged from 85/50 to 115/70 mm Hg, heart rate ranged from 55 to 75 beats/min, arterial oxygen saturation by pulse oximetry exceeded 97%, and end-tidal carbon dioxide tension ranged from 29 to 39 mm Hg with use of mechanical ventilation.

The surgical procedure involved microscopic left complete ethmoidectomy, left middle meatal antrostomy, and facial scar revision. No technical difficulties were encountered during the procedure, and no cerebrospinal fluid drainage or continued bleeding was evident.

The anesthetic agents were administered for 150 minutes. Neuromuscular block was reversed from four equal twitches of ulnar nerve stimulation with edrophonium, 30 mg, and glycopyrrolate, 0.6 mg administered IV. The patient began to breathe spontaneously at a rate of 15 breaths/min, the tidal volume was greater than 500 mL, and the end-tidal carbon dioxide tension was 39 mm Hg. She did not open her eyes or squeeze her hands to verbal command, but she did have an intact gag reflex. After her oropharynx was suctioned, the tracheal tube was removed. She was then transported to the postanesthesia care unit (PACU).

The patient's hemodynamic factors, respiration, oxygenation (as assessed by pulse oximetry), and tympanic membrane temperature were satisfactory in the PACU. She did not seem to be in pain or any other distress. She was observed in the PACU for approximately an hour before additional attempts were made to arouse her. The patient did not respond to verbal prompts or noxious stimuli. Ulnar nerve train-of-four and 50-Hz tetanic stimulations with 60 mA for 5 seconds revealed no residual neuromuscular block. A neurologic examination performed by the attending anesthesiologist disclosed no focal deficits, abnormal tone, or abnormal posturing of the patient. Her eyes were open; her pupils were 4 mm bilaterally and reacted directly and consensually to light. Ophthalmoscopy revealed flat optic disks, with no evidence of papilledema.

Flumazenil, 0.1 mg, was administered IV two times to reverse any possible residual effects of the midazolam given 3 hours earlier. The patient soon began to pant at a rate of 40 breaths/min, although she still was unresponsive. Propofol, 40 mg, was given IV for sedation, and her respiratory rate decreased to 16 breaths/min. Her clinical status was unchanged. Physostigmine, 0.5 mg, was administered IV to reverse any slight central anticholinergic effects of the glycopyrrolate given earlier. Her clinical status was still unchanged. The anesthesia drug box was examined for evidence of unintentional administration of other medications, but no such error had occurred.

Blood samples were withdrawn for arterial blood gas analysis, glucose level, and electrolyte concentrations. Arterial blood gas analysis revealed a partial pressure of oxygen of 110 mm Hg, a partial pressure of carbon dioxide of 27 mm Hg, a pH of 7.58, a bicarbonate concentration of 26 mEq/L, and a hemoglobin concentration of 12 g/dL. The glucose concentration was 108 mg/dL. Electrolyte concentrations were within normal limits except for potassium, which was 3.7 mEq/L (normal, 3.8 to 5.0).

The patient's husband was informed about her postoperative course. He was with her for about 5 minutes, but her condition did not seem to change. The nurse in the PACU reported that tears formed in the patient's eyes while he was observing her, but no other medical staff noted tears.

An emergency CT scan of the head was performed without use of contrast medium. No bleeding, thrombosis, mass effect, infarction, or intracranial air was evident.

A staff neurologist examined the patient. She did not respond to voice. Her eyes were open but closed mildly to threat. The patient responded minimally to deep pain. Doll's eye movements were suppressed. Cranial reflexes were intact. Deep tendon reflexes and Babinski's tests were normal. Muscle tone was normal; no waxy flexibility was evident in the limbs.

The patient was transferred by ambulance and admitted to a monitored ward in a Mayo-affiliated hospital. Arrangements were made for electroencephalography (EEG) to be performed, but before this could be done, she awakened spontaneously within a few seconds. Urinary incontinence was noted. She opened her eyes and said that she was fine. This return to consciousness occurred approximately 6 hours after completion of the operation. Findings on a neurologic examination were normal. She had no recollection of the events perioperatively until her awakening. She seemed relieved, for—as she stated—she had been having a conversation with her recently deceased stepson, and he had told her to "snap out of it." She said she was glad that she finally had a chance to say good-bye to him.
The results of a screen for drug abuse were normal. An EEG obtained the next morning showed an alpha rhythm of 9 to 11 cycles per second with no slow or epileptiform waves. Findings on a psychiatric assessment, performed by the psychiatrist who had examined the patient 2 weeks before the operation, were again thought to be consistent with depression. Use of trazodone, 50 mg administered orally at bedtime, was resumed. The patient had no suicidal ideation, and she was dismissed from the hospital 48 hours after the completion of her operation. Outpatient psychotherapy was arranged. At 5-week follow-up, her depression had decreased. No other psychiatric derangement was evident. She has not undergone additional surgical treatment.

DISCUSSION

Unexpected delayed awakening after use of general anesthesia has a plethora of causes. Medication-related causes explained by medication-related, neurologic, or metabolic mechanisms may have indicated that she required increased general anesthetic agents or that she was confused about general anesthesia versus regional anesthesia with sedation. These claims may have also reflected an idiosyncratic tendency toward dissociation due to the influence of central nervous system depressants. A sleep disorder may have been a contributing factor, but it was unlikely to account for all the associated events. A factitious disorder was unlikely because of the absence of evidence for voluntary control over symptoms necessary for the diagnosis. Likewise, malingering was unlikely because of the absence of evidence for external motivations for behavior necessary for the diagnosis.

Most likely, our patient had a dissociative disorder. Dissociative disorders are characterized by sudden disruptions in the normally integrated processes of consciousness, memory, identity, or perception. Mild dissociative symptoms are common in the general population and include such phenomena as the ability to ignore pain, feelings of depersonalization, periods of amnesia, and feelings of unreality. Our patient’s recollections and behavior were most characteristic of a trancelike state—that is, a period of dissociation. In addition, her lack of coherent recall of peripartum events is consistent with a dissociative cause. In light of her history of chronic depression precipitated by grief due to the death of a beloved relative, the episode was most likely prompted by undetermined psychologic issues. The trance “reunion” with her dead stepson apparently provided a temporary cure for the grieving process. Trancelike dissociative states may be induced by hypnosis, and we speculate that anesthetic agents have the same potential in a vulnerable patient. Vulnerability in this regard is primarily equated with suggestibility and secondarily with histrionic personality traits. We also speculate that her spontaneous awakening was due to suggestibility, and it supports the diagnosis of dissociation.
A few reports have described psychogenic coma after use of general anesthesia. A review article stated that “Hysteria or a catatonia-like state may be confusing sequelae of anesthesia.... It should be suspected when all physical findings are normal.” Unfortunately, no cases were cited. Another review article did not mention psychogenic causes of delayed return to consciousness. A recent report described two cases of factitious disorder as a cause of failure to awaken promptly after use of general analgesia. The two patients intentionally feigned failure to awaken. After organic causes were thoroughly excluded, the patients’ volitional unresponsiveness was unmasked with a placebo injection in one patient and cold caloric testing in the other. No evidence of intentional failure to awaken was noted in our patient.

A case of “hysteria” as the cause of failure to awaken promptly was described in a 22-year-old woman who underwent dental care with use of general analgesia. Her medical history was remarkable for a previous 12-day episode of unresponsiveness after dental care. That earlier episode was associated with unrevealing findings on a neurologic examination and normal findings on EEG. She was unresponsive for 4 hours after dental care and was awakened with use of 50-Hz tetanic stimulation of her ulnar nerve for 5 seconds. After she awakened, she apologized and went home. The term “hysteria” is no longer clinically accurate, and the cause of that patient’s failure to awaken promptly may have been a conversion disorder or a dissociative episode. The investigators of that report did not provide an in-depth differential diagnosis.

Identifying unusual aspects of the current case that might predict such an episode in other patients is difficult. The most relevant elements of our patient’s history were chronic depression and unresolved grief; however, these were thought to be mild. Treatment with paroxetine, a potent serotonin reuptake blocker, might have been a contributing factor by fostering dissociation. We were unable to identify any aspect of the surgical or anesthetic procedure that could have been altered to change the outcome. Cold caloric testing and EEG, the two studies that had been planned but not performed before our patient awakened, are additional ways of assessing consciousness during the period of unresponsiveness.

CONCLUSION
The purpose of this case report is to demonstrate that transient dissociative or trance-like states may occur after use of general anesthesia. The differential diagnosis of failure to awaken promptly after use of general anesthesia is vast, but most causes can be considered the result of medication-related, neurologic, or metabolic disturbances. In our patient, the apparent coma was clearly psychogenic and seemed related to depression and unresolved grief. Psychologic causes of failure to awaken promptly should be considered only after more common, and perhaps more threatening, causes have been excluded.

REFERENCES