Awareness during anesthesia: A rare but disturbing complication

According to the American Society of Anesthesiologists (ASA), intraoperative awareness with recall occurs “when a patient becomes conscious during a procedure performed under general anesthesia and subsequently has recall of these events” (ASA). Patients remember sounds, voices, tugging, and pain. Even without painful sensory perceptions, being awake but unable to communicate with the surgical team can cause severe distress and lasting psychological damage, including posttraumatic stress disorder (PTSD). Some patients describe awareness with recall as their “worst hospital experience” (Joint Commission).

Awareness with recall is thought to occur in approximately 1 to 2 cases per 1,000 in the general population undergoing general anesthesia (Mashour et al. 2011) or about 21,000 to 42,000 cases annually in the United States (Joint Commission).

In high-risk cases, such as cesarean sections, it is 10 times as common. Because not all patients who experience awareness with recall report it, the true occurrence may be even higher.

Patient outcomes
A literature review of 271 cases of awareness with recall between 1950 and 2005 found a variety of patient complaints, most commonly auditory and tactile perceptions rather than pain. For example, in one study, 72% of the patients reported tactile perceptions (such as pressure or tugging) and 70% reported auditory perceptions (such as sounds or voices), followed by feelings of acute fear, helplessness, and panic (58%, 56%, and 43%, respectively). Less than half of the patients experienced pain (Ghoneim et al.).

Half of patients who have an episode of awareness with recall experience some degree of mental distress, and 40% to 60% of patients may require extended psychological or psychiatric care (AANA).

“Later occurring psychological symptoms” include severe anxiety and PTSD and, in some instances, may not occur until years later (AANA).

The damaging psychological effects of awareness with recall should not be underestimated and, in at least one instance, are alleged to have caused a man to kill himself 2 weeks after the occurrence (James).

Lawsuits
Approximately 2% of the anesthesia medical malpractice claims in the ASA’s Closed Claims Project database were for awareness-with-recall claims. Although no single cause of awareness could be found in 35% of the claims, 37% were for light anesthetic and 28% were for anesthetic delivery problems. The median payment amounts for awareness claims was about $25,000 for claims from 1999 and earlier and $71,500 for more recent ones (Kent).
The mere fact that anesthesia with recall has occurred does not mean an anesthesiologist has been negligent or deviated from the standard of care (Domino et al.). Even if anesthesia was appropriately administered but the patient nonetheless awoke and the anesthesiologist knew, or should have known, that the patient became aware, the anesthesiologist and surgical team have a duty to address the problem. For example, in one case that settled for $400,000, the anesthetic gas vaporizer was found to be empty and the patient was “bucking during the procedure,” an obvious indication that the patient was feeling pain (Thomas).

ASA standards
ASA has standards for basic anesthetic monitoring that apply to all anesthesia care (except in emergency situations). In addition, according to an ASA statement on the documentation of anesthesia care, medical records should include anesthesia history and intraoperative record keeping should note any “unusual events,” which could include awareness with recall. ASA standards do not specifically address awareness with recall or awareness monitoring.

Action plan
One researcher suggests that awareness with recall can be reduced by half through audit and education and that merely drawing attention and improving understanding is an important preventative measure (Goddard and Smith). OR managers and other clinical and nonclinical staff can take additional steps, detailed below, to reduce the likelihood of awareness with recall.

Develop a clear policy
Having a comprehensive awareness policy in place is the first step in protecting patients, responding to adverse public relations in the event of media attention, or, in a worst-case scenario, preparing a legal defense.

The Joint Commission recommends that an anesthesia awareness policy address the following (Joint Commission):

- Education of clinical staff about awareness and how to manage patients who have experienced awareness with recall.
- Identification of patients at higher risk for intraoperative awareness and discussion with such patients, before surgery, of the potential for awareness with recall.
- Effective application of available anesthesia monitoring techniques, including the timely maintenance of anesthesia equipment.
- Appropriate postoperative follow-up of all patients who have undergone general anesthesia, including children.
- The identification, management, and referral of patients for counseling who have experienced awareness with recall.

Risk factors for intraoperative awareness

Patient risks
- Past history of awareness during anesthesia.
- Comorbidities such as ASA class 4 or 5, reduced cardiovascular reserves, or hemodynamic instability.
- Genetic or acquired resistance to anesthetic agents, such as the following: frequent users of benzodiazepines or opiates; habitual alcohol drinkers; users of drugs that affect metabolism of benzodiazepines or opiates; and the need for more inhalation anesthetic among patients with mutation of the melanocortin-1 receptor gene.
- Use of antihypertensive drugs and beta blockers.
- Gender (some studies indicate that women are more susceptible).
- Age (children and the elderly have a higher awareness incidence).
- Airways that are difficult to intubate, which may increase the use of muscle relaxants.
- Obesity, which can make it difficult to estimate the pharmacokinetics of IV anesthetic agents.

Procedure-associated risks
- Cesarean section.
- Cardiac surgeries, mainly where cardiopulmonary bypass is used.
- Emergency trauma surgery.
- Night surgery.

Anesthetic technique risks
- Use of muscle relaxants or paralytics.
- Total intravenous anesthesia.
- Failure to give benzodiazepines (which have amnesia-inducing effects).

Sources

American Association of Nurse Anesthetists (AANA) recommendations are similar; they state that the policy should include the following (AANA):
- Methods for identifying and managing an occurrence of awareness with recall.
- Mitigation strategies for preventing awareness-with-recall events.
- Requiring a perioperative team debriefing when an awareness event occurs.

Identify high-risk patients
A key component of the facility’s awareness policy is the identification of higher-risk patients (sidebar). ASA also recommends interviewing patients to assess level of anxiety and specifically asking about any history of awareness and previous experiences with anesthesia (ASA).

Reduce the risk of awareness with recall
Having identified the higher-risk patients, the anesthesiologist can take extra precautions. Medical staff leadership should develop clinical protocols for reducing the risk of intraoperative awareness. A clinical checklist could include items such as avoiding or minimizing administration of muscle relaxants, setting alarms for low anesthetic gas concentrations, considering treatments for hypotension other than decreasing anesthetic concentration, and redosing IV anesthesia when delivery of inhalation anesthesia is difficult, such as during a long intubation attempt or during rigid bronchoscopy (Mashour et al. 2011; ASA).

ASA recommends using multiple modalities to monitor depth of anesthesia during the operation, including the following (ASA):
- Clinical signs, such as checking for purposeful or reflex movement, although neuromuscular blocking drugs may mask purposeful or reflex movement.
- Conventional monitoring systems, such as electrocardiogram, blood pressure, heart rate, ETAC, and capnography monitoring.
- Brain function monitoring—while not routinely indicated for general anesthesia patients, the individual practitioner may decide to use it for selected patients, such as those receiving light anesthesia.

Awakening during a procedure does not mean a patient will remember the experience; the patient must be awake long enough (thought to be at least 30 seconds) to form a memory. If awareness is noted, the patient should be given more anesthesia immediately. The anesthesiologist may also administer a benzodiazepine, which may help increase the likelihood that the patient will not recall the event. ASA recommends that this decision be made on a case-by-case basis.

Ask the patient
Whenever awareness is suspected or known to have occurred, patients should be asked about it. The Brice protocol is a well-established set of questions that may be considered (Aranake et al.):
1. What is the last thing you remember before falling asleep?
2. What is the first thing you remember after waking up?
3. Do you remember anything between going to sleep and waking up?
4. Did you have any dreams during your procedure?
5. What was the worst thing about your operation?

The answers to these questions should be recorded and placed in the patient’s medical record. Episodes of awareness with recall that are discovered as a result of these questions should be acted on.

Act on reports of awareness with recall
Reacting sympathetically and doing everything necessary actions to lessen the impact of awareness with recall is the best way to deter patients from taking their case to the courts or media.
Both ASA and the Joint Commission recommend speaking with patients who report episodes of awareness with recall to get details of the event. When the patient is a minor, parents should be asked about signs or symptoms of awareness with recall that the child displays. It is important to let the patient describe the experience in his or her own words, to listen sympathetically, and to get all the details that a patient can remember; thus, ASA recommends that a questionnaire or structured interview may be necessary. Questions could include the following (Wennervirta et al.):

• What did you remember (e.g., sounds, voices, tactile sensations, visual perception, pain, paralysis)?
• Did you feel something in your mouth or throat?
• What was going through your mind during this experience (e.g., fear, distress, dread)?
• Did you think you were dreaming?
• How long do you think this experience lasted?
• Did you try to alert anyone during your surgery or procedure?
• What was your state of mind before the surgery or procedure?
• Have there been any consequences of awareness?
• How do you feel now?
• Did you inform any healthcare workers of this experience after you woke up?

Facilities may also wish to be able to categorize the nature of the awareness-with-recall episode for their own quality improvement, risk management, or other purposes, a practice that both ASA and AANA recommend. Everything that a patient describes should be recorded and made part of the medical record, but using a classification scheme will make it easier for everyone to quickly understand the nature of the event.

Perhaps the most important thing that this questioning can do is identify patients likely to have later-occurring psychological symptoms, such as severe anxiety or PTSD.

The Joint Commission, ASA, and AANA all recommend referring the patient to a psychiatrist or psychologist if necessary, and the Joint Commission notes that early counseling has been found to reduce the risk of PTSD. Clinical psychologists or psychiatrists trained in the diagnosis of PTSD should perform the psychological assessment. One recent study recommends three psychological assessments whenever an awareness-with-recall episode is suspected: at 2 to 6 hours, at 2 to 36 hours, and at 30 days (Aceto et al.). Even patients who are not likely to develop PTSD may need counseling, and organizations should ensure that those patients receive it.

References


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