ANESTHETIC DISASTERS

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Objectives:

Since the advent of sophisticated anesthesia machines, incorporating comprehensive monitoring, it is easy to forget that serious anesthesia mishaps still can and do occur. Claims involving anesthesia "disasters" share certain common factors. Review of these cases has led to a series of risk management recommendations. Simple changes in an anesthesiologist's day to day routine may help avoid instances of major anesthesia liability. This session seeks to familiarize anesthesiologists with the major categories of these claims, the circumstances surrounding them, and the positive steps that can be taken to prevent similar complications.

Monitoring:

With the widespread adoption of pulse oximetry and end-tidal CO_2 monitoring, anesthesia has become much safer. Serious injuries still result, however, with failures to use the monitors correctly. Inactivation of the pulse oximeter alarm accounts for a large proportion of anoxic injury cases that involve respiratory insufficiency noticed too late. Many newer anesthesia machines reset the alarm when the pulse oximeter is first attached to a patient and a pulse is sensed. On older models, the alarm must be manually reactivated after being turned off at the end of an anesthetic. Anesthesiologists should be aware of the status of the alarm at all times and make an effort to be extra vigilant when the pulse oximeter alarm must be silenced for any reason. Take extra time when using new or unfamiliar equipment to learn how the alarms are activated and limits set.

End-tidal CO_2 monitors may be underutilized for spontaneous ventilation or mask anesthetics, and can serve as an early warning sign of apneic episodes. A malpractice case involving a spontaneously ventilating patient will be less vulnerable to the accusation of missed apnea if the anesthesiologist's record documents the presence of a carbon dioxide tracing. Anesthesia procedures involving closed breathing systems (endotracheal tubes, LMA's) should have a numeric $ETCO_2$ value documented at least every 15 minutes. If a monitor alarms or reads abnormally low, check first to verify that the patient is adequately ventilated. Several severe anoxic injuries have resulted while anesthesiologists waited for the OR staff to change "broken" end-tidal CO_2 monitors or pulse oximeters that were later proved to be correctly functioning.

Esophageal Intubation:

Anesthesia malpractice cases involving esophageal intubations are seen by one carrier about 3-4 times per year. Intubating the esophagus is not negligent, but failure to promptly recognize the situation and replace the tube is. In many cases that are ultimately found to involve unrecognized esophageal intubations, the anesthesiologists claim they were sure the ET tubes were correctly placed because they had watched them pass through the vocal cords.

Alternatively, several argued that they had verified good breath sounds over the chest bilaterally. From a liability standpoint, in this day and age an $ETCO_2$ reading is the only acceptable method of proving correct ET tube placement in the trachea. Failure to immediately check and record an $ETCO_2$ reading in the presence of a functional CO_2 monitor would not meet the standard of care. It is surprising how many anesthesia records still do not routinely document $ETCO_2$ at regular intervals.

Many anesthesiologists fail to consider the possibility of esophageal intubation when patients are difficult to ventilate immediately after intubation. Two anesthesiologists documented extraordinarily high ventilatory pressures and zero $ETCO_2$ readings after intubations, but both erroneously attributed the situation to severe bronchospasm. Bronchodilators failed to improve the situation, but re-intubation by other anesthesiologists did – too late to prevent anoxic injuries to both patients. Arterial blood gases in these cases show extremely high pCO_2 and low pO_2 that suddenly reverses with re-intubation. Unfortunately, the laboratory results are rarely available in time to prevent anoxic damage, but they will be used later to prove the existence of an esophageal intubation in the event of litigation.

In a healthy pre-oxygenated patient, it may take up to 30 minutes for the blood pressure and heart rate to become unstable in the event of an esophageal intubation. Many anesthesiologists have argued unsuccessfully that a case could not have involved esophageal intubation, because the vital signs were stable in the immediate post-intubation period. After a difficult or prolonged intubation, anesthesiologists are understandably reluctant to remove an ET tube that does not appear to be functioning properly, but this is the situation in which it is most likely to have been incorrectly placed. The old adage "When in doubt, take it out!" still applies.

Labor and Delivery:

Many serious anesthesia complications occur on labor and delivery wards. There are likely many factors responsible for this. The anesthesiologist on L & D is confronted with concerns for both mother and child. Often decisions must be made in haste for the sake of a baby in peril. The ASA is quite clear, though, on the fact that an anesthesiologist's primary responsibility is to the mother. This could require than an emergent Cesarean section be delayed because of concerns about her safety. Several malpractice disasters have involved brain damage in the mother due to untreated respiratory arrest, because the anesthesiologist's attention was diverted in the hustle to transfer the patient for a crash C-section. Likewise an anesthesiologist should not leave an unstable mother requiring treatment unattended in order to assist with her newborn.

Labor and delivery is a unique environment where the anesthesiologist is often without the personnel and equipment backup found in the main operating room. Obstetric wards may not be stocked with difficult intubation equipment such as fiberoptic bronchoscopes, LMA's and Combitubes. Valuable time has been lost while labor nurses, unclear on where to find them, had to search for needed items. Drugs easily obtained from the pharmacy during the day may be nearly impossible to locate in the middle of the night if the main OR is dark and locked. Each anesthesia group staffing L & D should have a plan for major emergency situations, with each member aware of where critical items are stocked. Labor and delivery nurses should be inserviced on this as well. There should be a plan in place for calling additional anesthesia staff when needed for emergencies.

The physiologic changes of pregnancy are partly responsible for the increased incidence of anoxic injury associated with obstetric anesthetics. Decreased functional residual capacity in the mother greatly limits the duration of apnea required before serious hypoxia occurs. Unrecognized and untreated apnea has occurred after placement of labor epidural blocks, during transfer of patients, and after narcotic administration during C-section. Decreased lower esophageal sphincter tone and delayed gastric emptying predispose pregnant patients to aspiration. Surprisingly, few malpractice cases concern aspiration pneumonia in the setting of labor and delivery. This may be due to the consistent use of precautions taken to prevent it, such as prophylactic antacids and rapid sequence inductions for general anesthetics.

Frequently on L & D, an anesthesiologist is responsible for several patients simultaneously. Care should be taken that every patient is appropriately monitored for hypotension or hypoxia that could develop after placement of an epidural – preferably with a nurse or physician in the room. Malpractice cases that involve delays in treatment of maternal problems developing within 30 minutes of the placement of an epidural can be very difficult to defend, especially when investigation reveals that the anesthesiologist was with another patient providing non-emergent care.

Office Anesthesia:

Private office anesthesia, similar to labor and delivery, represents an environment where supplies and personnel may be quite different from those in the hospital OR. A code situation is not the optimal time to discover that there is no epinephrine anywhere in the office. Many anesthesiologists, when confronted with a new office practice situation, take considerable time evaluating the anesthesia equipment and learning where commonly used drugs are kept. They may never think to inquire about the location and stocking of emergency supplies, or whether malignant hyperthermia resuscitation items are available. The anesthesiologist remains ultimately responsible for the safe conduct of the anesthetic – which includes handling of any unforeseen complications - according to currently acceptable standards of care. There is no different standard for office procedures, which means that you are expected to provide the same care that would be available in a hospital operating room.

Complications related to recovery are not infrequently seen in office surgery malpractice cases. These have included a patient recovered in a converted broom closet attached to a pulse oximeter no one was close enough to hear, and another patient left in the care of front office personnel with no formal medical training. In an office, the anesthesiologist may need to be more involved than usual in the recovery area to make sure that the patient is safely cared for and discharged when appropriate. Be cautious about writing drug orders with wide limits (Demerol 25-50mg IVP Q 5 minutes PRN). Orders that leave crucial decisions up to personnel you do not routinely work with may be handled quite differently than the same orders given in the hospital recovery room.

Vigilance:

Almost all the anesthesia disasters discussed could have been prevented with better attention to the patient and to details. It is of course not possible to be 100% vigilant at all times, and factors like fatigue and stress are certainly involved. Good routines at critical times including the checking of blood units and reading labels of medications before injecting them should become

second nature and automatic. Extra attention is likely required at times of shift changes and during supervisory situations when the anesthesia management includes the work of others. If your attention is diverted from the patient or the monitors for any reason, including line placement or discussion with the surgeons, make sure that the appropriate alarms are activated and loud enough to be audible. Check the limits of the alarms at least once at the beginning of the day to verify that they are physiologic.

Conclusion:

Most malpractice cases involving major mishaps happen to anesthesiologists with established careers and minimal or no history of problems. Consider the times each day when you could be vulnerable to disaster should circumstances conspire against you. The changes in practices that would have prevented most of these cases are relatively minor and easily accomplished. Every one of these cases is one too many.