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ANESTHESIA—ACCIDENTS AND ERRORS

MOE LEVINE*

IN THE textbook, *Complications in Surgery and their Management* edited by Artz and Hardy, the section on "Complications of Anesthesia" occupies seventy-eight pages, whereas the other specialty complications average about twenty pages each, and the bibliography of the "Anesthesia" chapter contains 158 references to books and articles.¹ The tort lawyer who approaches the subject recognizes that anesthesia is an adjunctive procedure to surgery, and that the anesthesiologist works in conjunction with surgeons, so that separation of responsibility and medical conduct is difficult.

When considering general surgical malpractice, there is usually demonstrable evidence of the dramatic consequence of error, so that investigation can be made of unusual events and their etiology. To cite some illustrations, the severance of the urethra during hysterectomy always leads to the suspicion that the urethra was not identified and tagged, and that the cutting might well have been the result of carelessness. Similarly, upon an operation for removal of the parotid gland, cutting of the facial nerve will immediately give rise to suspicions of carelessness. In gallbladder operations, the cutting of the common bile duct always requires investigation as to identification and care. Further, this and many other procedures where carelessness has caused injury are correctable by prompt recognition and repair.

In contrast, errors in anesthesiology usually lead to morbidity, mortality, or serious permanent physiological injury. The exceptions are the errors which lead to nerve and limb injury, which, as will be pointed out, are the result of mechanical negligence rather than strict medical fault.

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¹ ARTZ AND HARDY, *COMPLICATIONS IN SURGERY AND THEIR MANAGEMENT* (2d ed. 1967).

The administration of anesthesia, classically recognized as the greatest boon to surgery, is a mixed blessing. It involves the introduction into the human system of drugs, either by inhalation or injection, which, being foreign to the human organism in whole or in part, constitute poison, the toxicity of which depends upon the amount administered, and the management of the patient during administration.

The human body, constituted and designed for maximum efficiency, despite its limitations, has built-in safeguards against any disturbance of its "milieu interieur" or homeostasis. Simply stated, when there is an invasion of the human body by any deleterious substance, or even a threat of invasion, the body reacts physically and biochemically to defend itself and to maintain its normal, healthy state. These mechanisms, such as pain, inflammation, temperature alteration, respiration, blood pressure, as well as the release of adrenalin, hyalin, cortisone, and other hormones, are inhibited and depressed in one degree or another by the drugs employed to produce anesthesia. This obviously fastens responsibility upon the anesthesiologist, who has achieved this interference with normal bodily processes, to monitor, guard, and assist the unconscious body in coping with the problems which must be anticipated and always occur under anesthesia. The right granted to the anesthesiologist by society to bring the patient to a condition just short of death, and to remove from him most of the built-in safeguards against morbidity, logically carries with it a concomitant responsibility equivalent to this awesome right.

The old days of the administration of ether as the sole anesthetic agent are gone. Science has provided the anesthesiologist with numerous anesthetics from which he may choose, dependent upon the state of the patient and the needs of the patient's body.

There are three steps with which the anesthesiologist is concerned:

(1) Pre-anesthesia, during which the administration of drugs is designed to relax the patient and to relieve his tension, nervousness and apprehension, generally requires the use of such drugs as succinylcholine to relax the jaw so that a tube may be introduced to aid respiration, and then curare, which is a muscle relaxant. An excessive amount of either, or any combination of the two drugs with each other, can produce death. The reader will remember that the first drug was found to be the cause of death in the trial of Dr. Coppolino in Florida. The second drug, acting as it does to relax all the muscles of the body, if not properly and continuously monitored,

may indeed produce this result, which means that all the muscles will relax, except the heart muscle which has special built-in protection, but including the lungs. If the lungs collapse and no emergency measures are taken, the patient will die.

(2) The second step is the administration of anesthesia during surgery. There are four stages of general anesthesia:

Stage I may be considered as lasting from the beginning of anesthesia to the loss of consciousness.

Stage II, called the stage of delirium, lasts from the loss of consciousness to the onset of a regular pattern of breathing.

Stage III lasts from the onset of the regular pattern of breathing to the cessation of respiration. Stage III contains four planes of unconsciousness, each of which has specific signs and symptoms. During a part of the third plane there may be excessive diaphragmatic movements which can be annoying during intra-abdominal operations, and thus the surgeon may ask for deeper anesthesia. At this point, strangely enough, it is required that anesthesia be lightened so that the intercostal muscles will resume function and diaphragmatic movements will become more rhythmic. This can also be accomplished by assisting the respiration so that the diaphragm will not be worked as hard. The knowledge and skill of the anesthesiologist is required to make this choice. Plane four lasts from the time of paralysis of the intercostal muscles to the cessation of spontaneous respiration.

Stage IV lasts from the time of cessation of spontaneous respiration to failure of circulation because of the increased concentration of anesthetic in the central nervous system. Stage IV is the crucial pre-fatal condition.

(3) The third step with which the anesthesiologist is concerned is recovery from the anesthetized state, including close observation in the recovery room.

When does an anesthesiologist's responsibility begin and when does it end? Let us describe the ideal anesthesiologist: board-rated, dedicated, skilled and concerned. This is not the standard, but we can use it as an acceptable ideal against which to measure the conduct of those who, lacking in any appreciable degree the qualities set forth above, inflict avoidable injury upon our client. This ideal professional will not administer anesthetic substances to a patient whom he has not visited and spoken with at least once before the surgery. He will examine the charts relating to the patient. If inadequate testing has been done,

he will require and insist upon further testing. He will personally discover whatever idiosyncrasies and allergies the patient possesses and is aware of. He will explain and describe to the patient the nature of the anesthetic which he proposes to use and will receive written consent from the patient to use the anesthetic of his choice. If, for any reason, the patient prefers another type of anesthesia, he will either adopt the patient's suggestion, if it is medically feasible, or convince the patient of the soundness of the original choice.

During the period of administration of anesthesia, he will monitor the patient and his physiologic responses continuously. He will select the drugs, having in mind the patient's size, age and physical condition, and he will plan not to over-anesthetize. During the course of the surgery, he will have immediately available to him all the instruments necessary to determine what effect the anesthetic is having upon the patient, including a firmly attached cardiac monitor, or, if one is not available, a stethoscope affixed to the patient and firmly secured to the ears of our ideal anesthesiologist so that he may be constantly aware of the patient's heartbeat. He will watch the patient's eyes, eyelid reflex, gag reflex, condition of skin, and color. He will be alert to sudden pallor. He will measure the breathing and will be immediately aware when exhalation exceeds, in time, inhalation. He will be constantly mindful that the amount of oxygen which the patient is receiving is adequate and, most especially, that the amount of carbon dioxide which is being retained, is not excessive. The heart may live, deprived of oxygen, for a considerable time. The brain will not. The estimates are that a brain deprived of oxygen or impeded by accumulation of carbon dioxide, will be exposed to irreversible damage within three to five minutes.²

Of course, he will either have inserted an airway through the mouth or nose, or will have created an opening in the trachea through which a tube is inserted. When, during surgery, oxygen is needed, sufficient time will not usually exist for an effective response to the emergency.

Now, suppose the anesthesiologist has done everything right to the best of his knowledge and ability, and suppose, despite that, the patient begins to fail. When the patient dies, the usual diagnosis is "cardiac arrest." The nuances of this term are artfully described in the article, "Cardiac Arrest in Surgical Patients":

² DRIPPS, ECKENHOFF AND VANDAM, INTRODUCTION TO ANESTHESIA (3d ed. 1967).

The term "cardiac arrest" is a useful and practical term. It immediately suggests something that has happened suddenly and unexpectedly. The fact that deaths due to overdose of anesthetic agents, hemorrhage, traumatic shock and asphyxia have been ascribed to cardiac arrest should not be considered a criticism of the term but rather examples of uncritical reporting.

Undoubtedly a diagnosis of cardiac arrest will be made in many instances in which subsequent study will show a specific cause, such as anesthesia, coronary occlusion, cerebral vascular accidents, or embolic disturbances due to air, fat, amniotic fluid, or blood clot. However, when cardiac arrest is suspected there is no time to ponder these possibilities. Immediate steps must be taken for the prompt re-establishment of effective circulation and ventilation with 100 per cent oxygen.³

It is just as important for a doctor to avoid those errors which lead to emergency, as to have the knowledge, skill and ability to respond to the emergency. A panic-stricken anesthesiologist is a menace in the operating room. He is more often liable for failure to respond to the emergency than for permitting the emergency to occur.

There are also mechanical errors attributable to the anesthesiologist which occur in the operating room. If the unconscious patient is badly positioned upon the operating table and kept in that position during protracted surgery, he may be left with a permanent back injury, because the human muscles, unsupported and subjected to severe strain, can be seriously affected. If the surgical patient's arms are not properly supported, he may emerge from the surgery with injuries to nerves which have been subjected to undue pressure. Since the formation of tears is inhibited by the drugs used, a patient whose eyes are permitted to remain open may emerge from the operation blind or with impaired vision. Certain inhalation anesthetics are volatile and explosive, so care must be exercised in the operating room with respect to the use of cauterizing implements and other electrical appliances to make sure that no explosion occurs.

The last responsibility of the anesthesiologist must be discharged after the operation has ended. At a series of lectures at the Veterans Administration Hospital delivered by the author on the avoidance of malpractice, a consensus of opinion was sought from a group of attendants who were all eminent in the field of anesthesiology in the City of New York. Of those surveyed, the overwhelming majority felt that an anesthesiologist may not upon termination of the surgery turn the still unconscious patient over to a nurse to be taken to the recovery

³ Keely, Schairer, and Carroll, *Cardiac Arrest in Surgical Patients*, 38 SURGICAL CLINICS OF NORTH AMERICA 55 (1958).

room and thereby absolve himself from responsibility for future events.

In the case of *Grimes-Graeme v. North Shore Hospital*,⁴ which gained wide exposure in the medical press, a baby recovering from a tonsillectomy was inadequately observed in the recovery room, and an airway which had been inserted by the anesthesiologist fell from its mouth. This lack of diligence left the infant with tunnel vision and cerebral palsy. This case never went to verdict; it was settled for the full amount of the hospital coverage. The anesthesiologist involved eventually recognized that turning the baby over to a nurse did not absolve him from responsibility. It is generally agreed that upon completion of surgery the anesthesiologist must accompany the patient to the recovery room with all of the fluids which are being administered firmly affixed to the patient, and that at least until the time that there is response to painful stimuli, his responsibility continues.

In light of the fact that many hospitals are today using nurse anesthetists, the chances of avoidable mishap seem only that much more magnified. In the accidents discussed, in the absence of a specialist anesthesiologist, the surgeon reserves full authority for the conduct of the anesthetist and cannot plead division of responsibility. He is the captain of the ship.

The cases which occur as a result of the lack of skill and requisite knowledge required in this field will entail collision with the eroded and outmoded locality rule, all the problems which still exist in some states because of charitable immunity, and the standards to which a non-medical anesthetist will be held. This article cannot review the law with respect to this problem, except to urge the thesis that the patient is entitled to optimum care and that the knowledge of what constitutes optimum care has been widely published both in books and articles.⁵

In summary, the investigation of probable liability in these cases is painstaking, arduous and expensive. The exploitation of trivial injuries, even where actionable, does not justify the rigors and uncertainties of litigation. Most of the adverse consequences of surgery anesthesia are more likely to be related to the unavoidable risks involved in the surgery itself than to faulty administration. There must be no pre-

⁴ No. 6204/60, Supreme Court, Nassau County, New York (1964).

⁵ See, e.g., ARTUSIO AND MAZZIA, PRACTICAL ANESTHESIOLOGY 302 (1962).

sumption of actionable negligence based solely on the fact that the patient did not recover or suffered a significant handicap. No suit should be started unless and until positive determination has been made as to the relationship between the anesthesia and the final result. Bad results, by themselves, do not necessarily justify suit. Before suit is started, the hospital records must be reviewed by the lawyer if he is capable of interpreting those portions which will offer clues as to what happened. If he cannot, he must consult with medical experts in this field. The attorney should depose everyone who was in the operating room at the time of the accident. His examination before trial must be exhaustive and must be preceded by his reading and absorbing of texts which will cast light upon his purposes.