

A REVIEW OF OVER FOURTEEN THOUSAND SURGICAL ANÆSTHESIAS

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SINCE the discovery of ether in 1846 by William Morton, much has been written about anæsthetics and their administration, and still ether and better etherization is more in favor to-day than ever before.

We are indebted to Dr. Bevan and Dr. Mellish for their most excellent articles on this important subject, on the after-effects as well as the administration of anæsthetics.

At St. Mary's Hospital our preference has always been ether. In 1905, out of 3,080 anæsthesias 2,847 were ether. In 14,380 anæsthetics given by me, I have yet to see a death directly from the anæsthetic, but, no doubt, have had my share of trouble in its administration, although artificial respiration with us is almost unheard of. Our experience with ether has become more gratifying each year. In my series of cases, the "open method" has been the method of choice. We have tried almost all methods advocated that seemed at all reasonable, such as nitrous oxide gas, as a preliminary to ether (this method was used in 1,000 cases), a mixture of scopolamine and morphine as a preliminary to ether in 73 cases, also chloroform and ether, and have found them to be very unsatisfactory, if not harmful, and have returned to ether "drop method" each time, which method we have used for over ten years.

On account of this method not being followed properly, it is not always appreciated. We use a four-ounce ether-can and fit an ordinary cork with a groove on either side into its mouth, fill one groove with absorbent cotton and let it extend out of the can about one inch. One can regulate the drop easily by the manner in which the point is clipped. We usually fix two cans, one with a large dropper, and use it until the patient is fully under the anæsthetic, and then change to the other can with the small dropper, and continue its use during the operation.

Patients usually walk into the operating-room and mount the table with assistance. All

foreign bodies, such as artificial teeth, chewing-gum, etc., are removed. The hands are fastened loosely across the chest with a wide gauze bandage, to prevent the arms falling over the sharp edges of the table, an accident which so often causes musculospiral paralysis. A pad of moistened cotton is placed over the eyes to protect them from the anæsthetic. If, during the course of administration, some of the anæsthetic should fall into the eye, drop a few drops of castor-oil into the conjunctival sac, to prevent the conjunctivitis that would otherwise follow.

It is a mistake to think that the same elevation of the head will do for all patients. The anæsthetist should elevate the chin to such a position as not to bend the neck too far back or approximate the jaw too near the sternum. Proper elevation of the head will relax all tissues of the neck and give more freedom in breathing. This, also, can be said of the jaw. Holding the jaw up and forward, and keeping it in position so that the patient gets the greatest amount of air possible, is an important feature in giving an anæsthetic. While too much emphasis cannot be laid on this necessary requisite in giving an anæsthetic, all jaws cannot be handled in the same manner. When a patient has removed a double set of artificial teeth, the tongue will often cleave to the roof of the mouth during the administration, and raising the jaw sets the gums so firmly together that most of the air is shut out, and this may not be noticed until the patient is cyanotic. We have found, in this class of cases, that if the jaw is held but slightly up and forward and the thumb of the same hand inserted between the gums, thereby holding the tongue down, faulty respiration will be corrected at once and the color restored. This is one of the instances where the holding up of the jaw too firmly can be overdone.

The inhaler used is the improved Esmarch, with two thicknesses of stockinet (frame boiled and stockinet changed after each patient). We use the dropper described, dropping as

plete narcosis is required. If the jaw is relaxed and in place, respiration deep and regular, color normal, quality of pulse good, there need be no fear about the rate of pulse or the pupils. Other points being equal, they are certain to be right.

As a rule, any person fit for a serious operation is also fit for an anæsthetic, but no one is so free from danger that care in watching its effects can be dispensed with. The cases requiring the greatest care are not the young and anæmic, for whom a small dose is sufficient, but the strong and vigorous, who inhale deeply and are inclined to struggle.

There is no class of cases that requires more close watching of every detail than the stomach cases, because they are poor subjects for anæsthesia of any kind, and the anæsthetist should be familiar with each step of the operation, so as not to give one drop more of the anæsthetic than is absolutely necessary. We give one sixth of a grain of morphine thirty minutes before the administration of ether, and the patient is given just enough to produce surgical anæsthesia, and as soon as the stomach is explored and the method of operation decided upon, the ether is withdrawn, the surgeon being able to continue operation, no more being given until time to close the incision.

In this class of cases the patients are allowed to become almost conscious many times, as the stomach is not sensitive, and there is no pain in the visceral work; thus we are able to complete the operation and avoid vomiting with an exceedingly small amount of anæsthetic.

The rolling of the eyeballs as noted by Simpson, swallowing, and control of the jaw are signs of returning consciousness, and a call for more ether. While we give less anæsthetic in this class of cases than in any other, it is this class that is most prone to pneumonia.

During the thirteen years' work at St. Mary's Hospital all patients have been anæsthetized on the operating-table in the operating-room, and preparation of the patient was going on at the same time. Experience has taught us that preparation of the patient while going under the anæsthetic is one of the important factors in producing a rapid surgical narcosis; for it diverts his attention, and much less anæsthetic is required. It matters not in what position

the patient must be for operation, we fix him accordingly, and the preparation is begun at the same time as the anæsthetic, and we feel certain that this procedure enables us to hasten narcosis.

In the Trendelenburg position, where the preparation is in progress during the administration of the anæsthetic, the deep respiration, etc., empties the pelvis, so that by the time the operation is started the small bowel will be found in the lower abdomen and out of the way, and maybe packed off. We have found this practice more helpful to the surgeon than placing the patient in position after the completion of narcosis.

In giving an anæsthetic for this class of surgery, the skill and patience of the anæsthetist is tried to the extreme; the patient must be fully anæsthetized, but not too profoundly. Patients having an acute peritonitis, as is so often found in this class of cases, require a much larger amount of anæsthetic to produce relaxation of the abdominal muscles. When the patient is prepared during the administration of each anæsthetic, there is no time lost, the surgeon and his assistant being ready by the time the patient is surgically anæsthetized. Another important reason for anæsthetizing the patient on the operating-table is, that in lifting and shifting a patient about, he is apt to regain consciousness, with vomiting, etc., and the administrator is not positive of the condition of his patient. Should ether produce difficult breathing, profuse secretion of mucus, or cough, lift the mask from the face, allow a liberal amount of air, and then continue with the ether. In giving plenty of air when needed, and less anæsthetic, we have found little use for an oxygen-tank, a loaded hypodermic syringe, or tongue-forceps. It is far better for the anæsthetist to become skillful in watching for symptoms and preventing them, than to become so proficient in the use of the three articles mentioned. We are exceedingly careful in our selection of cases with colds. An acute cold is a contraindication to any anæsthetic, but as soon as the cold becomes chronic there is not much danger from etherization, and instead of operating during an acute cold and giving chloroform (unless in an emergency), we wait a few days until the acute

slowly and carefully in giving the ether as though it were chloroform, until the patient's face is flushed, and then a few layers of surgeon's gauze are added, and the ether given a trifle faster until the patient is surgically etherized; then return is made to the same covering as at the start, and the regular drop continued throughout the operation.

As it requires very little ether to keep a patient surgically etherized, one can change to the small dropper during the operation. A much deeper narcosis is required to start an operation or to make the incision than later on, when the operation is in progress. It is useless to touch the cornea, as so many advocate, as it tells us nothing and is unscientific. Only the inexperienced take the pulse and touch the conjunctiva when giving ether.

Suggestion is a great aid in producing a comfortable narcosis. The anæsthetist must be able to inspire confidence in the patient, and a great deal depends on the manner of approach. One must be quick to notice the temperament, and decide which mode of suggestion will be the most effective in the particular case: the abrupt, crude, and very firm, or the reasonable, sensible, and natural. The latter mode is far the best in the majority of cases. The subconscious or secondary self is particularly susceptible to suggestive influence; therefore, during the administration, the anæsthetist should make those suggestions that will be most pleasing to this particular subject. Patients should be prepared for each stage of the anæsthesia with an explanation of just how the anæsthetic is expected to affect him; "talk him to sleep," with the addition of as little ether as possible. We have one rule: patients are not allowed to talk, as by talking or counting patients are more apt to become noisy and boisterous. Never bid a patient to "breathe deep," for in so doing a feeling of suffocation is sure to follow, and the patient is also apt to struggle.

In gall-bladder work, nearness to the diaphragm causes an irregular respiration, and this is sometimes mistaken for a call for more anæsthetic, when more often it is just the reverse. If the patient is surgically anæsthetized, the irregular breathing and grunting does not interfere with the surgeon. Instead of drown-

ing the patient with the anæsthetic, remove the mask at this stage and allow him plenty of air, and he will not become cyanotic. This is also true of operations on the sphincter muscles. Any manipulation will be followed by the same symptoms. Respiration is often interfered with in this class of cases. Obstruction is caused by the tongue falling back and depressing the epiglottis. Should any of these symptoms arise during the administration, raise the jaw up and forward, and instead of using tongue-forceps, catch the tongue with a piece of gauze and draw it up and toward the nose, a little to one side, withdrawing the anæsthetic. Should mucus become troublesome, one can easily wipe it out with an extra piece of gauze prepared for that purpose.

The dose required for each individual patient cannot be estimated so as to be of any value, as it depends largely on the temperament of the patient, pathological condition present, time consumed in anæsthetizing, and operating. The only one that can judge is the educated anæsthetist, who will give only what is needed to do good work. From experience we know a patient can be brought under ether in from three to five minutes, and, when ready, patients do better if the operation is started at once. Often the anæsthetist is blamed for not having some positive sign of complete narcosis. We have never found a single positive sign upon which we could rely. If the surgeon and anæsthetist are accustomed to each other, the surgeon seldom asks if the patient is ready. He knows from the deep respiration, color, and relaxation. Failures are in the acute peritonitis cases and in alcoholics. There are many signs that guide, such as deep respiration, relaxed jaw, as well as relaxed muscles; yet these signs sometimes fail. If the patient is kept in an even surgical anæsthesia, there is not enough change in the patient to warrant all the useless fussiness we sometimes see on the part of the anæsthetist. I rely a great deal on the relaxation of the jaw, both before and during operation. When the Trendelenburg position is necessary, it means trouble for the surgeon, and simply delays all work, to start the operation before complete relaxation.

During the operation, as soon as the patient begins to get control of the jaw, more com-

attack has passed, and then they are as good subjects for ether as for any other anæsthetic. Chronic bronchitis is often improved by an anæsthetic.

Pulmonary tubercular cases stand ether well. It has been proven that pneumonias follow a local anæsthesia as well as a general, so the trouble is not wholly from the anæsthetic. We often have a lung œdema present during the administration of an anæsthetic, and for several hours after an operation, that is often mistaken for ether pneumonia, but the œdema will clear up about the time an ether pneumonia should begin.

There is also an embolic and septic pneumonia that occurs independently of the anæsthetic and is due to an infection, and will sometimes occur with or without a general anæsthetic.

The dangers of general anæsthesia depend more on the lack of experience and incompetency of the anæsthetist than on the drug itself, in most instances. Many operations do not demand the long anæsthesia of ether, with its discomforts, neither do they warrant the dangers of chloroform anæsthesia. In this class of operations we have been using primary anæsthesia, and find it preferable to nitrous oxide gas, chloroform, or ethyl bromide.

Formerly, operations for exophthalmic goiter were looked upon with a great deal of dread, on account of the anæsthetic. We have found these cases, when properly managed, and the ether given by the "drop method," were as good subjects for anæsthesia as any other class of cases of the same gravity. We also give these cases $\frac{1}{4}$ of a grain of morphine and $\frac{1}{16}$ of a grain of atropine, the latter to avoid tracheal mucus, thirty minutes before operation, and find it very helpful in tiding the patient along with but a small amount of anæsthetic.

The method of giving chloroform is quite like that of ether; yet there are marked differences to observe. Chloroform should be given with more air and in less quantity, with the regular and small drop. Chloroform acts quickly, and should be given slowly and carefully, the pulse being taken at the facial or temporal arteries. Anæsthetists should never allow either the patient or themselves to feel hurried. Stop inhalation as soon as patient

has reached surgical anæsthesia, giving just what is needed, and not one drop more. When struggling occurs, withdraw the chloroform entirely until the patient is quiet, as struggling will produce deep inhalation; hence the danger. Embarrassment in respiration during the administration of chloroform should always be considered serious, and it requires prompt attention and an immediate withdrawal of the drug.

The pulse often misleads the novice. It may be very weak just before vomiting, when one might think there was less need of anæsthetic, while really it is a call for more. A thready, intermittent pulse indicates trouble. As Dr. Finney says: "It is well to watch the character and rate of pulse, but of far more importance to watch the respiration as the earliest indication of danger." The eyes may give warning of danger. A rapidly dilating and fixed pupil is a danger signal, while a pupil contracted to a normal size or a little less indicates surgical anæsthesia. The color of the blood is also important. Watch all symptoms, but do not rely on any one of them. When giving chloroform to children, I never feel safe if the child is profoundly under, and I try to avoid this condition, aiming to keep it as nearly as possible in moderate anæsthesia. An unsatisfactory pulse or respiration is a call for plenty of air. By doing this there will be little need of the numerous drugs so often resorted to.

Nearly all fatalities on the operating-table due to an anæsthetic are from chloroform, either mixed with some anæsthetic or given unadulterated. Public opinion is so much in favor of ether at the present day, that if accidents in its use occur, the surgeon will not be blamed, and it is to his interest, as well as to that of his patient, to see to it that his anæsthetist becomes proficient in the administration of all anæsthetics, especially ether.

While surgeons know that a competent anæsthetist is one of the important factors in the operating-room for his own comfort, as well as for that of his patient, there is no class of work that has so little encouragement, and few are willing to follow this line of work (that, in difficulty and nerve-strain, is next to that of a surgeon) long enough to become familiar with the first requirements of a good anæsthetizer.

To give an anæsthetic properly is all one person can do, and he who undertakes to learn surgery at the same time makes a serious mistake. It has been my privilege to instruct several in the administration of anæsthetics, and I must say that nurses become the most proficient in this line of work. They do not aspire to be either a surgeon or an assistant surgeon; hence it is not difficult for them to

give their undivided attention to the anæsthetic. I am sure the time is not far distant when nurses will be looked upon as best fitted for the administration of anæsthetics.

One derives little or no benefit from textbooks. While one should be competent in the theoretical part of this important work, there is nothing so helpful to the anæsthetist as the hard school of practical experience.