ANESTHESIA IN AURAL SURGERY.

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The question of anesthesia in aural surgery needs no introduction to those familiar with operations about the mouth and pharynx and the surgeon who encounters such cases must of necessity feel the relative importance of its administration.

While we cannot boast of an ideal method of anesthesia in aural cases, we can, by earnest efforts properly directed, look forward with confidence to a satisfactory solution of the problem. Many valuable suggestions have come to us from the surgeons engaged in such operations but the field of anesthesia has become so important in our present day that it requires the undivided attention of those engaged in this work. It logically follows that we look to the anesthetist to offer the suggestions that may be of assistance in this regard; and it is hoped that the method here described may be a step forward and that some of the features will prove of assistance to those engaged in this work.

The skilled anesthetist fulfills a conscientious duty to the patient and to the surgeon and it is his earnest effort to perform his duties to each to the best of his ability. His greatest aim is to carry the patient through the anesthetic with the least amount of shock and to reduce to a minimum the post-operative distress that is so frequent after a prolonged anesthesia. This can only be accomplished by the administration of a uniform anesthesia of sufficient depth to carry the patient along the "border line" of complete narcosis, and to avoid as much as possible the interrupted anesthesia that is so wearing on the patient. He must be an assistance to the surgeon and not a hindrance. The field of sterility in aural cases must be preserved with the same care as in an abdominal operation. The anesthetist should be scrubbed and gowned in all cases where he is likely to come in contact with the operator or his implements, and the sterile linen about the head of the patient should be kept free from contamination by the anesthetist. The method of anesthesia that is adapted should be carefully planned so as to avoid any interference with the movements of the operator and to leave him the greater area of the field in which to work. To accomplish this, the anesthetist must have the necessary equipments, and the method of procedure should be planned to meet each individual

case. This might seem a difficult task to many, but in the cases at St. Vincent's Hospital we have found it a great advantage to consider the difficulties in aural cases and to attempt to eliminate them wherever possible by improving the method of anesthesia; and with the kind of co-operation of the attending surgeons I have been afforded ample opportunity to apply these principles in the cases that are best adapted for its use.

The patient receives the usual preparation for the operation in regard to rest, the bowels and diet. He should be insured a good night's rest preceding the operation, and one hour before going to the operating room a quarter grain of morphin and one one-hundred fiftieth of a grain of atropin should be given. The preliminary anesthetic of choice is gas-ether, which is continued until a degree of anesthesia sufficient to abolish the conjunctival reflexes is obtained. The patient is then placed on the operating table or chair, as the operator may desire, the face-mask is removed, and the anesthesia for the remaining period of the operation is maintained by our present method, which comprises the following features: 1. Illuminated, hollow, tongue-depressor. 2. Ether vapor machine. 3. Aspirator.

The tongue depressor embodies three distinct features: (a) It serves as an instrument during the operation and thereby reduces the number of instruments in the mouth. (b) It allows for the passage of ether vapor. (c) It illuminates the pharynx. It is the instrument of choice because it is more constantly used than any other, and for the greater part of the operation is within the pharynx. It is also of great aid in keeping the tongue depressed and prevents an obstruction to the respired air. The ether vapor is passed through the instrument to the base of the pharynx, where it meets the tidal air from the nasal and aural cavities. Here an atmosphere of warm ether vapor of any desired percentage can be created. The instrument (here illustrated) consists of a hollow lingual portion and a handle which is set at right angles to the body of the instrument. The material used is sheet metal, sufficiently strong to withstand a great strain. The lingual portion is hollow to permit the passage of the ether vapor and to direct it downward towards the pharynx. The small lamp which affords the illumination is set in a depression on the lingual portion well down near the tip and is protected with a transparent film of fiberloid, which insures safety against an accident to the lamp. A two-volt lamp is set into a detachable rod that traverses the entire length of the lingual portion of the instrument, and enables one to sterilize

the instrument by boiling and to replace a small lamp without delay. The handle of the instrument is hollow and contains a two cell battery capable of a continuous illumination for several hours.

In certain cases we find it necessary to substitute for the tongue-depressor a laryngeal speculum (here illustrated) of the accepted design, but made with the added features for illumination and for ether vapor. These parts are interchangeable on the one handle and are connected with a threaded joint of standard size so that they may be quickly changed whenever it becomes necessary. The use of the illuminated tongue-depressor for anesthesia has greatly fa-

Figure 1. Ether vapor machine: (A) Ether cup. (B) Ether vaporizer and vacuum sphere. (C) Aspirator. (D) Rotary Blower. (E) Air filter and stabilizer. (F) Mercurial manometer. (G) Universal motor.

cilitated our work in many respects. The actual time of the operation is shortened; the anesthetist may serve as an assistant to the operator, as well as administer the anesthetic; the field of operation is well illuminated by the rays of light from the lamp, which are directed upward and backward into the nasal and aural cavities; and of still greater advantage is the clear field of operation afforded the surgeon without his having to share his limited space with the anesthetist.

The second unit consisting of the ether-vaporizer is a mechanical device of my own which produces a mixture of air and ether of any desired percentage, warms it to the body temperature and allows for the determination of air volume and pressure. It consists of a rotary blower, a motor, an air filter and stabilizer, an ether cup, and a vacuum sphere containing an electric heater surrounded by a coil of copper tubing. As the air leaves the rotary blower it is passed through an air filter and stabilizer where foreign particles are removed and the flow of air made more constant. A mercurial manometer attached to the stabilizer indicates the air pressure. It then passes into a coil of copper tubing that sur-

Figure 2.

rounds an electric heater, and both heater and coil are inserted in a vacuum-lined sphere. The vacuum sphere retains the heat around the coil and also serves as a reservoir for boiling water when electricity is not available. The ether is introduced into the air current from a drop cup before it enters the copper coil and in its passage through the warm coil it is completely vaporized and then allowed to flow through a rubber tube to the illuminated tongue-depressor and thence to the pharynx. The volume of the air passing through the vaporizer may be varied by changing the speed of the motor. The rotary motor that I have adopted is capable of delivering 20 liters a minute, which is greater than the amount required since the patient takes the normal amount through the

mouth and nose with each inspiration; hence it is unnecessary to deliver through the machine more air than is required to carry the ether vapor to the pharynx. The approximate strength of the ether vapor can be determined by allowing a known amount of ether to drop into a uniform volume of air passing through the machine each minute and to a degree an absolutely uniform anesthesia may be maintained.

The third feature of the method, and one that has proved to be of great assistance in the cases of aural surgery, is the aspirator. In the cases that are operated on in the erect position, the blood and mucus that fall into the posterior pharynx are often very annoying to care for, because of the great difficulty in breathing, and of the possibility of developing a case of pneumonia directly due to the aspiration of septic mucus or blood into the trachea. The aspirator is attached to the inlet valve of the rotary blower and consists of a glass jar with air-tight connections, one attached to the blower and the other to a tube leading to the patient. The mucus and blood that gather in the pharynx are sucked into the tube and carried to the glass bottle or jar where they are deposited and accumulate in the bottom of the receptacle until the operation is completed. This feature of the machine was of great service in tonsillectomies and adenectomies that were treated in the erect posture. The entire field of operation is completely exposed to view and illuminated, thereby giving the operator a chance to make a clean enucleation and to keep the field clean and dry.

This combination has served us with success in the cases thus far, and we have every reason to believe that it will continue to be of assistance. The ease with which the machine can be operated makes it a safe practice even in the hands of the interne; and the weight of the machine, which, all told, is not over fifteen pounds, will make it useful to one who wishes to operate in the home with the same degree of safety as in the hospital. All these features may not be applied in every case, but as the occasion demands we can change the method slightly to meet the requirements of the particular case. The laryngeal speculum, the tongue-depressor, the nasal catheter or the intra-tracheal catheter, may be used as the occasion demands; and in the event of not having electricity for power we can use a foot bellows and boiling water in the vacuum sphere with equal success.

The advantage of the method may be summarized as follows:

1. Shortens the duration of the operation.
2. Diminishes the

shock to the patient by permitting a shorter, lighter and more uniform anesthesia. 3. Lessens the post-operative distress. 4. Lessens the secretions in the mouth. 5. Respirations are not obstructive. 6. Lessens the possibility of bronchitis and pneumonia. 7. Illumination of the pharynx permits of a more complete view of the operation and does away with the inconvenience of a head-mirror and the electric attachments. 8. Aspiration of blood and mucus keeps the throat clear and enables one to control hemorrhage easily. 9. Gives the surgeon complete control of the operative field and does not interfere with the sterility of the operation.

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A Rare Case of Exclusive Localization of the Fuso-Spirillar Symbiosis. R. GEZES, *Rev. hebdomadaire de Laryngologie*, March 28, 1914.

The patient, a woman of 22, developed difficulties in swallowing and breathing and great pain. A laryngoscopic examination was difficult on account of the marked swelling of the fauces. The region of the lingual tonsil was entirely covered with a pale pseudo-membrane, the whole lymphoid region presenting marked inflammation. The hypertrophied lingual follicles were congested and slightly ulcerated. The action of the arytenoids was normal and the vocal cords were only slightly inflamed.

A bacteriological examination showed much epidermic detritus in the midst of which were found numerous cocci, staphylococci, bacilli ramosus, spirilla and fusiform bacilli. The patient recovered after twelve days, the treatment consisting principally of insufflation of potash and irrigations of boro-oxygenated water.

The diagnosis of this condition from diphtheria presents some difficulty but the following points will assist: The temperature is higher than in diphtheria; the inflammatory process is more limited and with less involvement of the adjoining regions. The fetor is characteristic of the fuso-spirillar infection; the bacteriologic examination, however, is the distinctive factor in the diagnosis.

SCHEPPEGRELL.