REFRESHER COURSE FOR GENERAL PRACTITIONERS**ANAESTHESIA FOR MINOR PROCEDURES**

BY

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For most minor operations the anaesthetic is also of a minor character. As such it should be characterized by a high degree of safety, simple equipment and method of administration, pleasant sensation and memories to the patient, speedy recovery, and, not least, effectiveness for the surgeon. The occasional anaesthetist, however, must not be misled into thinking that, because the proposed surgical procedure is a minor one, the anaesthetic for it will for a certainty present no difficulty or that little skill will be required. Many examples of the reverse come to mind. The patient with submaxillary cellulitis may need but a small incision, but, as is well known, he may well die before the surgeon even starts his little operation. The child who is to have a small cut sutured may regurgitate a piece of the apple he was eating when he fell down and cut himself, and die of acute respiratory obstruction therefrom. The much tattooed, burly seaman who is to have an easy dental extraction may be in the chair for only a few minutes, yet his short stay may not only leave its mark both on the dentist's furniture and on the anaesthetist's reputation, but the momentary anaesthesia required may have been obtained only at the cost of extreme and dangerous anoxia. These examples are given here, not to frighten the general practitioner, but to put him on his mettle and to forewarn him never to relax his awareness of possible, though happily rare, difficulties and dangers.

Children

Examples of common minor operations in children for which the practitioner is likely to be asked to give an anaesthetic are circumcision, tonsillectomy, the setting of a greenstick or other fracture, and the opening of an abscess. Before any such anaesthetic a hypodermic injection of atropine should always be given. Up to the age of 2 years a suitable dose is 1/200 gr. (0.32 mg.); from 2 to 5 years, 1/150 gr. (0.44 mg.); and from then onwards 1/100 gr. (0.65 mg.)—all these being given about half to one hour before the operation. In the case of children over 2 or 3 years old, $\frac{1}{2}$ to 1 gr. (32 to 65 mg.) of pentobarbitone sodium by mouth two hours beforehand will make the child placid or even sleepy and fear and crying will be largely obviated.

For the anaesthetic itself many drugs and techniques are available, but for young children and infants the best method of all for the practitioner, as indeed it is for the specialist, is an induction with either ethyl chloride or vinyl ether, followed by ether dropped on to a gauze mask. The ethyl chloride should be administered cautiously, squirt by squirt, but only until the child ceases to struggle, for its purpose is not so much to produce full anaesthesia as to subdue the child and to depress its reflexes enough for it to breathe without restraint the more irritant ether vapour. The addition of ether to the mask is then started. Should insufficient ethyl chloride have been given and the child respond to the ether by breath-holding, coughing, or swallowing, a little more ethyl chloride can be given. By this means overdosage with ethyl chloride is avoided. It is rarely necessary to use gamgee between the mask and the face; certainly this should

not be done in the hope of avoiding an "anaesthetic eye," for this condition, though it may possibly be caused by the anaesthetic coming in contact with the cornea, is more commonly the result of rubbing the cornea with gauze or a towel. Oil should not be put into the eye before or during an anaesthetic, because any ether in the vicinity will surely dissolve in the oil.

For children over the age of about 7 or 8 years nitrous oxide, oxygen, and a little ether may be administered from a Boyle apparatus in the manner described for adults, although even for these older children open drop-ether anaesthesia is most effective and very suitable.

After an operation lasting a few minutes recovery from ether anaesthesia of this sort is very rapid and, apart from perhaps an occasional single vomit, the child is none the worse. It may be put to sleep in its mother's arms or even sitting up on a chair or on the operating table if the anaesthetist thinks it will be kinder. As soon as the child is under, it should be placed on an operating table so that its airway may be properly controlled and the anaesthetic administered. An artificial airway is generally unnecessary in infants and children and should on the whole be avoided as more likely to be traumatic than helpful. Respiratory obstruction is more often due to the anaesthetist's fingers holding up the infant's lower jaw than to leaving it alone.

When the operation is over the child should be placed on its side and carefully watched until consciousness returns, so that respiratory obstruction or vomiting can be dealt with. A good guide in this respect is not to let the child go back to the mother until it has recovered enough to cry.

Adults

Common examples of minor procedures are incision of septic finger or abscess, the setting of a minor fracture, biopsy, and removal of an ingrowing toe-nail. As the patient is likely to be ambulant and will want to return to that state as soon as possible after the operation, premedication of any sort is best avoided. In very nervous patients this view may be relaxed somewhat, but even two or three aspirin or codeine compound tablets half an hour before the operation, or a $\frac{1}{2}$ -gr. (32-mg.) capsule of pentobarbitone sodium one hour before, will have the right effect without interfering very much with the patient's rapid recovery after the operation, apart from the need to refrain from driving home in a car.

The most suitable anaesthetic for these little operations is nitrous oxide and oxygen, with, if necessary, a trace of trichlorethylene added to the gases before the operation starts. The induction of anaesthesia should not be hurried; it is a common but erroneous belief that nitrous oxide anaesthesia is a quick method. The more slowly induction is carried out the smoother will the subsequent anaesthesia be. Induction is started with pure nitrous oxide and after a few breaths oxygen is added in gradually increasing amounts till, finally, a mixture of about 1.5 litres a minute of oxygen and about 7 litres a minute of nitrous oxide is being given. An average time for induction is 7 to 10 minutes. The trichlorethylene, when it is to be used, should be added cautiously to the gas mixture soon after the start, and as soon as the patient is breathing regularly it should be turned off. Poor anaesthesia is more often due to insufficient oxygen than to too much. The patient's colour should in general be a bright crimson and in any case never worse

than a slightly dull pink. Any obvious cyanosis indicates that more oxygen should be added to the mixture. It is better to use a little trichlorethylene than to cut down the oxygen.

Elderly People

With old people, and indeed with ill and feeble patients in general, particular care should be taken that at no time is the oxygen supply inadequate. The patient's ears should remain crimson the whole time. In these patients more than in any other is it preferable to add a little trichlorethylene to the gas and oxygen than to run the real risks of insufficient oxygenation.

Dental Extractions

These patients form a group in themselves. In young children ethyl chloride or vinyl ether on an open mask is suitable, while for older children nasal nitrous oxide and oxygen may be used, the anaesthetist erring on the side of too much oxygen rather than the reverse. In adults, nasal nitrous oxide and oxygen from an apparatus such as the Walton or McKesson is the routine everywhere. These machines allow slight positive pressure to be used and permit the oxygen percentage to be varied easily without upsetting the pressure. The technique of continuous nasal nitrous oxide is soon learned. The secrets for success are a proper position of the patient in the chair, in which the head is in a natural relation to the body, being neither extended nor flexed; an unhurried induction; satisfactory insertion of a gauze mouth-pack so that debris is held without the respiration being obstructed; the use of slight positive pressure; and adequate support by the anaesthetist of the patient's head and jaw during the extraction.

Thiopentone

This substance is extremely valuable for putting a patient to sleep in a pleasant manner. Its use as the sole anaesthetic, however, should be attended with the greatest of caution. Many fatalities and near fatalities have occurred because the anaesthetist has failed to realize that this drug, while having marked hypnotic properties, is a poor analgesic, and that it will not prevent reflex movement to pain until enough of the drug has been administered to practically stop breathing.

In practice a 5% solution is made up and injected through a fine needle very slowly, allowing plenty of time for the drug to circulate, until the patient is unconscious. For the average fit adult this dose will be about 0.25 g. (5 ml. of 5% solution). Great care is taken that the injection is into a vein and not into the tissues or into an artery. In the former instance the swelling outside the vein is usually obvious, while the patient complains of pain at the site of injection. In the latter the most constant symptom is severe pain of a burning character in the hand. The dire results of intra-arterial injection make it imperative to avoid any veins which lie contiguous to an artery or in a position where an aberrant artery is likely to be found.

Once the patient is asleep the injection should be stopped and the anaesthetic continued with nitrous oxide and oxygen, with or without trichlorethylene. If it is the wish of the anaesthetist to use thiopentone as the sole anaesthetic, the patient's reaction to pain should be tested as soon as he is unconscious. For example, the surgeon might prick the skin with his knife. If necessary another small amount should be given and the patient tested again. This manoeuvre is repeated until no movement takes place. The habit of arbitrarily deciding on what the single dose is to be, and then injecting, is to be condemned, because in this way overdosage easily occurs. The reaction of patients to thiopentone varies widely and it is nearly impossible to judge this merely by looking at them beforehand. It is almost certain that respiration will be very depressed or even absent at the moment that the patient no longer reacts to the operation. When he is robust and the dose of thiopentone

correct, respiratory activity quickly recovers spontaneously. If breathing does not start or regain its vigour within a minute or so the anaesthetist should not hesitate to resort to artificial respiration, by squeezing the chest, or better still by a squeeze of the reservoir bag, or by blowing with the lips down a facemask held on to the patient's face so that his lungs are inflated. Recovery after thiopentone is markedly slower than after nitrous oxide and a period of drunkenness may persist for some hours.

Though no more apparatus than a syringe and needle is required, the less obvious but more important ingredients for safety with thiopentone are caution and long experience. The practitioner will have less anxiety and have better success with his minor anaesthetics if his first inclination is towards inhalation anaesthesia rather than intravenous for any but the most minor of minor procedures.

Difficulties

Respiratory Obstruction—The practitioner should beware of anaesthetizing patients with marked respiratory obstruction. These patients may die very quickly as soon as they are made unconscious and unable to use the accessory muscles of respiration on which perhaps their life was depending. These cases, though the surgery may be small in extent, call for the greatest skill and experience on the part of the anaesthetist. Little more will be said about them here, except that the essence of safety is to relieve the respiratory obstruction before the patient is made unconscious.

Vomiting—If the patient is known to have had food within three hours of the anaesthetic it is better to postpone the operation rather than to risk the very grave dangers of regurgitation and inhalation of vomit. Many patients die each year from this cause, although they were having a simple anaesthetic for a minor operation. In cases of emergency it is justifiable to empty the stomach by passing a large stomach tube just before the anaesthetic is begun. The gravity and danger of inhaling vomit cannot be over-emphasized, as also the fact that this may occur with the most trivial procedures. In these instances the tragedy is all the greater.

Resistance to Anaesthesia—The practitioner may find that patients who are excitable, in great pain, addicted to alcohol, or generally robust may be difficult to subdue enough to remain immobile during the operation. When this occurs he should not hesitate to add trichlorethylene to the nitrous oxide and oxygen and allow plenty of time for this drug to take effect. If this difficulty is anticipated, because of reports of previous anaesthetics from colleagues or the patient himself, premedication such as that mentioned above should be ordered; when this is impracticable an intravenous injection of 10 to 15 mg. of pethidine may be given just before the anaesthetic is started.

Fire and Explosion

The practitioner should bear in mind that both ether and ethyl chloride are highly inflammable substances. They should never be administered in the presence of an open flame of any sort or of any other obvious source of ignition. Smoking in particular should never be allowed in the vicinity of an anaesthetic. The addition of oxygen to either of these substances makes them highly explosive, and if such a mixture is ignited a violent detonation may occur, with grave injury to the patient and perhaps structural damage to the room. Whenever a diathermy is to be used or the anaesthetic is to be administered in the presence of an open flame, nitrous oxide alone or with some trichlorethylene, or thiopentone, should be the anaesthetic selected. Chloroform cannot easily be justified except in unusual circumstances for a minor operation, in view of the availability of the alternatives mentioned and of the known dangers of cardiac arrest, of overdosage, and of late poisoning, the incidence and occurrence of all of which are now established beyond reasonable doubt.

Post-operative Care

The patient should be allowed to recover from his short anaesthetic in his own time and no attempt made to waken him by slapping his face or other manœuvre. Even after consciousness has returned, enough time should be allowed for him to feel really recovered before he gets to his feet. On no account should a patient be allowed to drive a car after an anaesthetic, or even to go out into the street unless accompanied by another adult. Although apparently normal, a period of post-operative mild drunkenness and disordered judgment may persist for some hours, particularly if more than the smallest amounts of trichlorethylene or thiopentone have been used.

"THE FOUNDER OF SCIENTIFIC SURGERY"

HUNTER MEMORIAL AT ST. MARTIN'S

The President and members of Council of the Royal College of Surgeons, with members of the Hunterian Society and others, attended at St. Martin-in-the-Fields on February 14 when a tablet in the crypt was unveiled and dedicated recording the fact that the body of John Hunter had rested in the vaults of that church from 1793 to 1859, when it was removed to Westminster Abbey. After the General Thanksgiving and prayers the President of the College (Sir Cecil Wakeley) read a lesson from the Wisdom of Solomon:

"For God himself gave me an unerring knowledge of the things that are, to know the constitution of the world, and the operation of the elements . . . the natures of living creatures and the ragings of wild beasts, the violences of spirits and the thoughts of men, the diversities of plants and the virtues of roots: all things that are either secret or manifest I learned, for she that is the artificer of all things taught me, even wisdom."

The clergy and a part of the congregation then proceeded to the crypt, where Sir Henry Dale unveiled the tablet, which was dedicated by the Dean of Westminster. When they

had returned to the church a commemorative address was given by Sir Gordon Gordon-Taylor, who narrated briefly the circumstances attending the discovery and identification of John Hunter's remains.

Identification of Hunter's Coffin

At a Hunterian dinner in 1847 Dean Buckland of Westminster, father of Frank Buckland, expressed regret that the medical profession had erected no monument to Hunter, and mentioned that he had himself suggested the propriety of such a monument in Westminster Abbey. Eleven years later Frank Buckland, then an assistant surgeon in the Second Life Guards, read an Order in Council requiring the vaults of St. Martin's to be cleared of their coffins, and, having confirmed the fact of Hunter's burial there, he set himself the macabre task of finding Hunter's coffin among more than 3,000 in the charnel house. It was the last but one exposed to view, and a few weeks later, in a gathering of more than 600 persons, the remains were re-

interred in the Abbey between the graves of Ben Jonson and Charles Lyell. Words written by J. F. South, then Junior Vice-President of the Royal College, and contained in the ornamental brass which covered Hunter's remains in the Abbey, doubtless mirrored the views of surgeons nearly 70 years after his death:

"A gifted interpreter of the divine power and wisdom at work in the laws of organic life . . . the founder of scientific surgery."

To this day they saluted one "who was great through mortal days and died of fame unshorn."

After this homage to the great shade of Hunter, Sir Gordon Gordon-Taylor proceeded to speak of Frank Buckland, whom the tablet also commemorated, describing him as a somewhat erratic surgeon-anatomist, a great investigator in natural history, with a bias for turning to practical use the facts he ascertained, and, like Hunter, a great collector. He formed a fish collection which he left to the Science Museum, South Kensington, and his work was continued by the Buckland Research Foundation in gathering together and summarizing knowledge, especially recently acquired knowledge relating to important food fish.

A third name, he added, inevitably stole into the thoughts of some of them, for it was owing to the zeal and enthusiasm of the late George Grey Turner that the project to place the plaque in the church had come to fruition. With many a difference between them, Hunter, Buckland, and Grey Turner were all great collectors and fervent believers in the value of the museum; all three were incessantly industrious, and all died immersed in the work they loved. Their name and life and work would endure long after any memorial in stone had perished. In the great words which Thucydides put in the lips of Pericles in his famous funeral oration over the Athenian dead: "The whole earth is the tomb of great men. Neither is their name graven only on stone which covers their clay, but abideth everywhere without visible symbol, wrought in the stuff of other men's lives."

Nova et Vetera

AN ANCIENT MEDICAL COMPENDIUM

Caelius Aurelianus: On Acute Diseases and on Chronic Diseases. Edited and translated by I. E. Drabkin. (Pp. 1,019. £5 12s. 6d.) Chicago: University of Chicago Press. London: Cambridge University Press. 1951.

One of the most versatile of the ancient Greek physicians was Soranus of Ephesus, who flourished about 100 A.D. He wrote on almost every aspect of medical theory and practice, as well as on philosophical and other subjects. Most of his works have disappeared. His gynaecology, however, survives in some very peculiar, very early, and very famous illustrated manuscripts, the influence of which persisted for fifteen hundred years and may still be traced. Of his other writings by far the largest and most complete, though lost in the original Greek, has come down to us in a Latin version prepared in the fifth century by one Caelius Aurelianus of Numidia, the modern Morocco. This work is an immense treatise in two parts, one on acute, and the other on chronic diseases. The manuscripts of this Latin translation have also been lost, so that the modern editor must rely on editions of the sixteenth century, making such emendations as his skill in scientific literary criticism will permit. Such an edition has hardly been attempted since 1709, so that Professor Drabkin has, in effect, been working in a new field, hitherto almost untouched by modern scholarship. An edition of Caelius Aurelianus has long been regarded as a special need of Latin scholarship, for it has points of linguistic as well as of medical interest.

In the later pre-Christian and the earlier Christian centuries medical thought developed into various sects or "schools" founded on different philosophic principles. The most prominent, and for long the most influential, of these was the so-called "Methodist," to which Soranus and his