

REVISION SERIES

VIII. ANAESTHESIA IN GENERAL PRACTICE

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The tendency today is for patients for operation under anaesthesia to be admitted to hospitals and nursing homes; and they are seldom anaesthetized in their own homes. It follows, then, that general practitioners, except those who practise in remote areas, anaesthetize their patients in consulting rooms, nursing homes or

hospitals. The remote country practitioner is at a grave disadvantage because he is often obliged to work single-handed and greatly handicapped by lack of skilled assistance.

General practitioners who administer anaesthetics may be divided into 3 categories:

1. There are those who combine anaesthesia as a 'slant' with their general practice. They are often attached to hospitals and administer large numbers of anaesthetics, acquiring a high degree of skill and experience, which puts them into the same rank as the specialist.

2. The great bulk of general practitioners, who may be described as 'occasional anaesthetists' and who administer anaesthetics for minor surgical, obstetrical and dental procedures which arise from time to time in the course of general practice.

3. A group that may be described as 'very occasional anaesthetists'. They mostly practise in remote areas and have given a minimum number of anaesthetics since the 'statutory twenty' of undergraduate days; if possible they would altogether avoid the administration of anaesthetics.

It is to these latter groups (2 and 3) that the remarks in this article are addressed.

The ideal anaesthetic agent should have a high degree of safety, should be easily portable, should be as pleasant as possible from the patient's point of view, and should afford maximum facility to the surgeon operating.

APPARATUS REQUIRED

This includes the following:

Inhaler. No anaesthetic, however brief, should be administered to any patient unless the administrator has available a simple type of inhaler. This consists of a mask, with expiratory valve, attached to a rubber reservoir bag which by tubing can be connected to an oxygen cylinder. This simple apparatus is invaluable for resuscitation and administration of high-concentration oxygen, and is used to ensure adequate pulmonary ventilation by intermittent pressure on the inflated bag.

This apparatus is readily portable, especially if attached to a 6-cubic-foot oxygen cylinder with a simple type of reducing valve. Compressed air may be used instead if oxygen is not readily available. As an alternative to this a small concertina hand-bellows (Macintosh) is even more portable because the cylinder and reservoir bag above described are dispensed with. This simple apparatus allows fresh air to be pumped into the lungs as long as is required.

Schimmelbusch-type of Mask for the administration of ethyl chloride and ether.

Cylinder of Carbogen (i.e. 6% CO_2 in oxygen), with attached reducing valve.

Syringes and Needles. Ten c.c. and 20 c.c. syringes with an assortment of needles for local, intravenous and caudal techniques.

ANAESTHETIC AGENTS AND TECHNIQUES OF CHOICE

1. Ether

My advice to the 'occasional' and the 'very occasional' anaesthetist is to learn how to give 'open drop' ether. In spite of its objectionable and irritating odour, with careful and judicious administration ether can be given in a tolerably pleasant manner, and it has the redeeming feature of being a safe agent in the hands of infrequent users. A trickle flow of carbogen under the mask

will encourage more even respiration, and less tendency to swallowing, breath-holding, coughing and laryngeal spasm, and will make the induction less tedious. Ether has the advantage of illustrating clearly the stages in anaesthesia and one knows exactly where one is with it. It has stood the test of more than 100 years and is still used extensively all over the world—in some clinics almost exclusively, even for thoracic surgery.

The use of ether—an inflammable vapour—is contraindicated where the cautery is used, and of course in the presence of a flame or an open fire.

I would recommend Guedel's book *Inhalation Anaesthesia* as a fundamental guide. It is most readable and will be of great help in the solving of many anaesthetic problems.

2. Local Anaesthesia

This is most useful for many of the minor surgical procedures in general practice, and is used not nearly enough. With proper approach it can even be used very satisfactorily in young children.

The factors which make for success in the administration of local anaesthesia are accuracy of placement of the local anaesthetic solution, adequate time for it to act, and the addition of adrenalin chloride in dilution of not more than 1 in 250,000 (except in digital surgery, where the adrenalin must be excluded). A wheal should always be raised before administration and gentleness of technique of injection avoids unnecessary pain.

There is very little difficulty in the technique of local anaesthesia, and it causes minimal general disturbance to the patient; and of course its extreme portability is most advantageous.

Procaine hydrochloride, $\frac{1}{2}$ -1%, suffices for most purposes, and more concentrated solutions (2-3%) should be used where the solution is placed in close proximity to larger nerves or nerve trunks and roots.

There are many books which illustrate the technique of local anaesthesia and it is not difficult to acquire skill at it.

3. Caudal Epidural Anaesthesia

This is a technique with which general practitioners should become acquainted. It should be taught in the undergraduate phase because of its wide application in general practice. It needs practice for perfection. In brief the technique consists of the passage of a needle through the sacral hiatus into the caudal canal, and injecting 1% Procaine (with adrenalin), 40-50 c.c., scrupulous asepsis being observed.

The technique is carried out more easily with the patient in the prone position with pillow support of the pelvis, and the feet in the 'pigeon toe' position. It can also be carried out with no great inconvenience in the left lateral position with the right leg flexed at the hip and knee. This is the position most comfortable for administering to the pregnant patient. The insertion of the needle may be difficult because of anatomical abnormalities of the sacrum, and adiposity which obscures landmarks, but in general the technique presents no great difficulty and can be carried out painlessly and effectively.

Caudal anaesthesia has the advantage that there is

no element of inflammability and it can therefore be used in the presence of the cautery, etc. It is useful for any procedure in the 'saddle area', dilatation of urethral stricture, forceps delivery, stitching of perinaeum, haemorrhoids, ischio-rectal abscess, fissure-in-ano, etc. The dangers must not be overlooked which come from sepsis, broken needles and inadvertent entry into the theca.

OTHER AGENTS IN ANAESTHESIA

Ethyl Chloride is indeed useful for young children and infants, carefully administered, not for the purpose of full anaesthesia but rather to put the child into the state of accepting irritating ether vapour without struggling or resisting. It can very often be used for this purpose in adults too.

Pethidine Hydrochloride. This is most useful in doses of 25-50 mg. administered intravenously, especially where local anaesthesia is not quite adequate.

Thiopentone. This is an anaesthetic agent very widely used, and for which patients clamour. There is no question at all about its pleasantness for induction and its ready portability, but a warning must be sounded as to its danger. It is said that more people die today from thiopentone than did during the chloroform era. It has been significantly described as 'dead easy to give'. Its best use is not as an anaesthetic (it is not one) but to induce sleep before the administration of an anaesthetic. The tendency for severe laryngeal spasm to occur when 'open drop' ether is used after thiopentone induction makes it quite unsuitable for this purpose. If it is used in excessive dosage, not only is it dangerous because of severe respiratory depression, but waking-up time is much prolonged, and there is very often uncontrollable restlessness during the recovery period. It is an agent which requires great care for its safe usage. The danger of inadvertent intra-arterial and intraneural injection of thiopentone should be carefully noted.

The Relaxants (Curare and synthetic curarizing agents). These are definitely outside the scope of the 'occasional' and 'very occasional' anaesthetist. Their use is invariably followed by apnoea, sometimes prolonged for many hours, and the danger of regurgitated stomach contents causing suffocation is extremely great. In a recent analysis covering 600,000 anaesthetics it was found that the death rate was increased sixfold when relaxants were used.

Trichlorethylene. An inhaler apparatus is necessary for the administration of this agent and, although it is a good analgesic, it has dangers when pressed to anaesthetic level.

PRE-OPERATIVE PREPARATION OF PATIENTS

No patient, young or old, should be subjected to any operation, minor or major, without pre-operative preparation, psychological and physical. Adequate premedication, not overdosage, is of the greatest importance. With children 1/200—1/100 gr. of atropine hypodermically ½-1 hour before operation, and ½-1 gr. of pentobarbitone sodium by mouth 2 hours beforehand,

makes the child placid or even sleepy and allays fear, and crying will be obviated. Personality changes have been noted in many children, especially those of 2 and 3 years of age, who have been submitted to anaesthesia and operation without premedication, the changes reported being night terrors, temper tantrums, bed wetting, etc. The study of children in all age-groups has shown that if crying and struggling took place during induction, then one or more of these personality changes was likely to occur. These studies prove how important premedication is and how necessary kindness is on the part of the anaesthetist.

With adults premedication is especially indicated in very nervous subjects. In minor operative procedures the premedication must be of such a nature that it will not delay the time the patient shall become ambulant. Aspirin and codeine, or pentobarbitone sodium, will not delay recovery. On the other hand if the operative procedure is a little more profound, adequate premedication with omnopon gr. ½ and scopolamine gr. 1/150, 1½ hours before operation, will not only allay apprehension but will tend to lessen the amount of anaesthetic needed. It must be noted that scopolamine has a marked drying effect on the secretions, apart from being an excellent amnesic. It is necessary to administer premedication at least one hour before operation because of the initial phase of stimulation which precedes the depression; it is obviously undesirable for the patient to be operated upon in a stimulated state.

DIFFICULTIES AND DANGERS IN ANAESTHESIA

Before every anaesthetic the patient should be physically examined and it is important to ascertain the existence of allergy and idiosyncrasy and to obtain the history of previous anaesthetic administration. The anaesthetist must be aware of the existence of obstruction in any part of the respiratory tract, and if this is of gross nature he must avoid general anaesthesia and resort to local anaesthesia. The importance of a clear airway and avoidance of anoxia cannot be overstressed. This is so in all cases, and especially in the aged, where anoxia may prove fatal. It is not necessary to employ electrocardiography to assess the cardiovascular status. The patient's history is a good guide; so also is his exercise tolerance.

The Danger from Stomach Contents

While the history of the patient as to the time of ingestion of food or the time of the last meal is important, there is no certainty that by 3 or 4 hours after a meal the contents will have passed on from the stomach. When operations are pending and especially in cases of emergency there does seem to be a slowing up of the passage of food. This is well demonstrated in small children and infants. It is as well to delay 5 or 6 hours after a meal in non-emergency or elective cases for surgery, but in the dire emergency, where there is danger to life in delay, then despite the unpleasantness to the patient, one must resort to gastric lavage if a general anaesthetic is to be administered. This must not be carried out with a Ryle's tube, but with a large-bore stomach tube. The passage

of the tube may be facilitated if the patient is made to suck an anaesthetic lozenge beforehand.

Gastric lavage is a very unpleasant procedure, unnerving and distressing to both patient and operator. But the inhalation of stomach contents is a tragedy which must at all costs be prevented and unless the operation can be delayed until the contents have passed on there is no other way of preventing it. A stomach tube should be tied to the anaesthetic mask to remind the anaesthetist of the ever-present likelihood of a full stomach.

Attention must be drawn to the risk of aspiration of stomach contents in complicated midwifery, where obstetrical manoeuvres are to be carried out under general anaesthesia and in emergency. Labour-ward management in many institutions is such that feeds are given from time to time during the course of labour. The danger of this practice is seen when sudden emergency arises, and anaesthesia has to be administered without delay in order to save the mother or child or both. To obviate this danger a rule should be instituted that no solid food should be permitted during labour. To combat exhaustion and acidosis the mother is encouraged to take fluids and glucose in the first stage of labour, and if acidosis has been established intravenous glucose may be administered. Epidural caudal anaesthesia is the method of choice in these cases. Failing this, if there is the slightest suspicion that the

stomach is not empty, there must be resort to the stomach tube followed by 'open drop' ether.

Much has been written recently on the posture of the forceps case for general anaesthesia. The consensus of opinion is that the left lateral position is safest from the point of view of avoiding the danger of inhalation of vomit, and that the lithotomy position tends to increase the risk of regurgitation of food into the hypo-pharynx followed by inhalation. During induction of general anaesthesia the foot-down tilt is the safest and most satisfactory where it is suspected that the stomach may not be entirely empty; and this position is strongly advocated.

SUMMARY

1. Safe anaesthetic techniques have been discussed for 'occasional' and 'very occasional' general-practitioner anaesthetists.
2. The methods of choice are 'open drop' ether, local anaesthesia, and caudal epidural anaesthesia.
3. The dangers of thiopentone and relaxants are stressed.
4. The necessity for pre-operative preparation, psychological and physical, is discussed.
5. The importance of a clear respiratory tract and empty stomach are emphasized—the former from the aspect of dangerous anoxia, and the latter from the aspect of dangerous inhalation of stomach contents, leading to asphyxia and death.