the surface readily, and to enable a satisfactory appendicostomy to be made. Thin subjects, however, seem to show improvement very soon after the vegetable oil instillations and alkaline wash-outs are begun, especially if there are the usual signs of severe toxæmia, and if abdominal examination reveals a tender, contracted condition of the iliac and pelvic colon.

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THE CHOICE OF ANÆSTHETIC IN RECTAL SURGERY.

BY J. K. HASLER, M.B., B.S.LOND.

Senior Anæsthetist to St. Mark's Hospital for Diseases of the Rectum.

THE majority of operations for disorders of the rectum are confined strictly to the perineum. This is advantageous to the anæsthetist for two reasons. Firstly, if a general anæsthetic is decided upon, the administrations of the anæsthetist are far removed from those of the surgeon and each can work freely without getting in the other's way. Secondly, if a local or regional anæsthetic is preferred, the anæsthetist is dealing with a part of the body well adapted for this type of anæsthesia. The merits of each variety will now be considered.

General Anæsthetics.

The requirements of a general anæsthetic administered for cases of hæmorrhoids, fistulæ, fissures, &c., are that it should be short and deep. Depth of anæsthesia is required to relax the anal sphincter, and to avoid unconscious movement on the part of the patient which may occur when the sphincter is stretched under light anæsthesia. For the anæsthetist with limited experience ether will probably be found most satisfactory, either given on an open mask, or by means of a Clover's or similar form of inhaler. If the latter is used it will often be found that the 2 oz. placed initially in the inhaler will suffice both for induction and for the maintenance of anæsthesia during the operation. There is also the added advantage that if the patient is at all light at the start it is much easier to increase the depth of anæsthesia with a closed inhaler than with an open mask.

If gas and oxygen is used it will usually be found advantageous to employ some ether in addition, though the amount necessary will naturally vary with the patient. If suitable pre-anæsthetic medication is given, however, gas and oxygen can be a perfectly satisfactory anæsthetic without the addition of any ether at all, the only drawback being the necessity for a somewhat elaborate piece of apparatus.

Chloroform is widely condemned for rectal operations. Stretching of the anal sphincter may cause cardiac inhibition through the vagus, especially under light anæsthesia, which is most undesirable in the presence of chloroform.

Local Anæsthetics.

Under this heading are included both local and regional forms of anæsthesia. They are of three types: (a) Local infiltration; (b) extrathecal nerve block; and (c) intrathecal nerve block.

(a) Local infiltration. This is the simplest form and consists essentially in the injection of a suitable anæsthetic solution (e.g. novocain 2 per cent.) in the immediate vicinity of the operation area. An intradermal wheal is first raised by injecting a few minims of the solution just posterior to the anus and in the middle line. A longer needle is then inserted through this wheal and a ring of anæsthetic is then injected subcutaneously to encircle the anus. Further injections are then made just outside the circumference of the rectum at a depth of about 2 in. from the surface. This provides a simple and satisfactory method of producing anæsthesia for hæmorrhoids but is less suitable for fistulæ. It distorts the area of operation somewhat and there is a possible risk of spreading sepsis in the neighbourhood.

(b) Extrathecal nerve block. There are three varieties of this form of anæsthesia, viz., caudal block, trans-sacral block, and a combination of the two which is commonly known as sacral block.

Caudal block anæsthesia is produced by injecting a quantity of anæsthetic solution (e.g., 40 c.c. novocain 1 per cent.) through the sacral hiatus into the caudal canal. The injection is usually given with the patient in a prone position with a pillow under the loins. Even with a preliminary subcutaneous injection of novocain it is not always possible to make this procedure completely painless and the resulting anæsthesia may take up to half an hour to develop in some cases. In other cases only analgesia results and is not happily tolerated by a nervous patient who can feel "something going on."

Trans-sacral block is produced by injecting a few c.c. of the anæsthetic solution into each of the sacral foraminæ so that each nerve is blocked as it emerges from the caudal canal. The procedure is one which requires considerable practice before proficiency is attained and may become very difficult in obese subjects where the bony landmarks are difficult to determine.

Caudal and trans-sacral blocks are often combined to produce a sacral block and those who have had extensive experience of this method claim that good anæsthesia can be obtained in nearly every case.

(c) Intrathecal nerve block. This is commonly spoken of as spinal anæsthesia and is produced by the injection of a suitable drug intrathecally, thus blocking the nerves before they emerge from the dura mater. For rectal work it is convenient to limit the anæsthesia to the perineal region, thus avoiding any drop in blood-pressure and causing a minimum amount of discomfort to the patient. A satisfactory anæsthetic agent is 0.4 c.c. of stovaine (10 per cent.) in saline which should be injected in the lower lumbar region. The patient should adopt a sitting posture during the injection, and the spine should be flexed as much as is conveniently possible. After the injection the patient should sit upright for a minute or two to allow the anæsthetic solution to gravitate downwards. By this means only the lower sacral nerves are affected and a saddle-shaped area of anæsthesia is produced in the perineum. Another anæsthetic which is often used for the same purpose is 1 c.c. of percain 1 : 200 which produces anæsthesia of longer duration than stovaine though it takes slightly longer to develop. This low spinal anæsthesia is easy to administer, rapid in action and provides good anæsthesia lasting well over an hour. It is invaluable in rectal surgery.

Abdominal Operations.

A small proportion of all rectal operations are concerned with the treatment of malignant growths and it becomes necessary to operate on the abdomen and perform a

colostomy or to attempt a radical removal of the growth in addition. Most of the patients are elderly, and many of them must undergo two operations if the removal is done in two stages. Whatever form of anæsthesia is given must satisfy three requirements. Firstly, there must be adequate relaxation so that the surgeon can work easily and without using unnecessary force. Secondly, it must be deep enough to permit the surgeon to explore the pelvis and liver with the object of determining whether secondary deposits are present. Thirdly, the patient must remain fit enough after the anæsthetic to face a possible second operation within ten days or a fortnight.

Open ether is the simplest and easiest to administer and it provides good relaxation which enables the surgeon to work at ease. Its chief disadvantage lies in the fact that it may produce post-anæsthetic vomiting, and in feeble subjects there may be some chestiness following. Gas and oxygen will hardly give the necessary relaxation without the addition of some ether, though the amount required will vary considerably with different patients. Spinal anæsthetics are quite satisfactory as they provide good anæsthesia with good relaxation. For the performance of colostomy a solution of percain 1 : 1500 is as good as any. It gives a longer anæsthesia and the condition of the patient during operation appears to be more satisfactory than with many of the other agents. An injection of 11 or 12 c.c. should be given in the lumbar region, after which the patient should lie prone for five minutes. This solution of percain has a lower specific gravity than cerebrospinal fluid, and unless this manœuvre is carried out the posterior nerve roots will remain unaffected by the anæsthetic and relaxation will be produced without anæsthesia. Although chest complications do occur after spinal anæsthesia, there should be no hesitation in using it if there is any question about the patient's fitness for operation.

For excision of the rectum spinal anæsthesia is invaluable as a means of preventing shock. Combined with twilight sleep, or some form of basal narcosis, it permits the operation to be performed with the minimum discomfort to the patient.

Premedication.

All patients should be given some sort of sedative before operation. For the smaller rectal operations an injection of morphia $\frac{1}{6}$ or $\frac{1}{4}$ gr. and scopolamine $\frac{1}{150}$ or $\frac{1}{100}$ gr. works very well if given about an hour before the patient leaves the ward. For bigger operations, such as excision of the rectum, the hypodermic injection should be given one and a half hours before the time of operation, and half an hour later one or two capsules of nembutal ($1\frac{1}{2}$ to 3 gr.) should be given by mouth. The patient will then arrive at the theatre, either asleep or in a very drowsy state, so that the subsequent recollections are very hazy. Avertin can also be used instead of nembutal, but it is rather more troublesome to administer. For patients who are undergoing perineal excision of the rectum, avertin should be introduced through the proximal end of the preliminary colostomy. Avertin should be used with care in the presence of spinal anæsthetics as each drug causes a fall in blood-pressure.

Careful pre-anæsthetic medication is of material use in diminishing the amount of general anæsthetic necessary. It enables the anæsthetist to administer gas and oxygen alone to cases which would otherwise require the liberal addition of ether to produce the desired relaxation.