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operation. This can be done with ease by enlarging the split in the external oblique for another inch or more, lifting the cord and suturing the compound tendon of the internal oblique and transversus beneath it to Poupart's ligament. Experience has shown that when a recurrence occurs, it is usually an immediate recurrence. The recurrence occurring immediately the patient gets up is due to faulty ligature of the neck of the sac. The elastic peritoneum released after ligature of the aperture is very liable to slip the ligature. This cannot occur if the aperture formed by the neck of the sac is sewn in addition to simply tying the ligature.

The majority of herniae occurring in men of military age are small bubonoeles or congenital herniae containing omentum.

I attach considerable importance to the removal of the prolapsed omentum, which is always of abnormal length, with a view to preventing recurrence.

Several sequelae follow hernia operations which are of more significance than recurrence; I refer to such conditions as hydrocele, retraction of testicle, thickening of the spermatic cord, painful scars, neuralgia and enlargement of the testicle.

These unpleasant and almost incurable results are due to damage to the spermatic cord, the delicate structures of which are adversely affected by much less disturbance than is usually supposed. In the operation described the only content of the cord which is either seen or touched is the sac.

I have found this operation of particular value when dealing with cases of recurrent hernia. The new operation is performed above the matted scar tissue of the old operation and completed by Bassini's method almost with as much ease as a primary operation.

SOME ANÆSTHETIC POINTS.

By CAPTAIN C. T. W. HIRSCH.

Royal Army Medical Corps.

In an American Journal I noticed some time ago a rather apt doggerel:—

"The very worse saying
More people betraying
Than anything under the sun,
Is, just give a whiff
Of chloroform, if
There's nothing much to be done."

It came to my mind lately when some doctors said they dreaded to have to give an anaesthetic, and that they would appreciate some tips. Hence this article.

It is said that a motorist has three speeds, viz., that which he tells the police he is driving at, the one he mentions to his friends, and that which he really drives at. So with the anaesthetist, the method the surgeon remarks on, the one the patient comments about on the following day, and lastly, that the administrator imagines he himself is employing. These three, like the automobilist's speeds, do not always coincide.
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The anaesthetist is really the pilot, who has charge of the ship of life, while it is sailing in a reef-abounding sea. My methods have, up to date anyway, always enabled me to get my bark safely into port, and I trust if any trouble to peruse these hints that they will experience like fortune.

The points to safeguard the welfare of the patient are:

(1) Proper preparation of patient, including preliminary hypodermic of morphia and atropine.
(2) Suitable selection of anaesthetic and method.
(3) A gradual induction.
(4) The maintenance of a patent airway.
(5) Uniformity of anaesthetic dose and anaesthesia.

(1) The Preparation of the Patient.

Where possible the bowels should be cleared out by medicine given on the second night before the anaesthetic, followed by an enema early on the day of operation. Only light nutritious foods should be taken for a couple of days before. Unless the patient is in a very feeble state of health the last meal should be taken not later than five or six hours before the operation. The meal should consist only of soup, freed from fat, broth or meat jelly. Milk is undesirable.

The best preliminary hypodermic is morphia one twelfth and atropine one hundredth grain, given twenty minutes before the anaesthetic starts.

(2) The Selection of Anaesthetic and Method.

In military hospitals there are, roughly, two classes of cases, young men in first-class condition in the hospitals in England, who come in for hernia, varicose veins, appendicectomy, nerve suture, or orthopaedic operation; and at home, but from the fighting line, of men in a condition of shock, or of serious sepsis. The first are ideal with chloroform given with a percentage inhaler, the second are easily anaesthetized, but much more likely to suffer afterwards. Nitrous oxide and oxygen with occasional ether answers well with these cases, or warmed ether especially if oxygen is bubbled through or over the ether, and a subcutaneous saline with glucose given at the same time. The test of a suitable anaesthetic is: a quiet induction, a good colour, the relaxation, the operator desires, and an absence of post-anaesthetic sickness. With some a bit of lint and a drop bottle will achieve this. I prefer the percentage chloroform inhaler; the following description is condensed from my original article in the Lancet of April 1, 1916:

The apparatus, as illustration shows, consists of a metal cylinder divided by a thin-domed false bottom into two chambers. The lower one is coned to take an ordinary gas face-piece, and is provided with a movable angle connexion for use when the patient is on his side or face. Various pieces are made with different angles so that the pot can be kept fairly vertical, irrespective of the patient's position. A central tube passes through the lid and upper chamber, terminating in the false bottom, and conveys air directly to the face-piece. This central tube is surrounded by an air cone which is expanded below over the false bottom in a baffle plate, so as to distribute the air equally over the anaesthetic. A by-pass passes from the upper chamber through the cone and projects into the air tube. The air cone is provided with an opening or port, admitting air to the upper or chloroform chamber. The size of the port is regulated by a movable collar on the lid, and an indicator shows the percentage of chloroform which is passing to the face-
Explanation of Figures on Sketch.—A, Inlet for chloroform addition; B, chloroform by pass to air chamber; C, chloroform tube; D, hollow dome; E, angle connexion for face piece; F, port or air inlet closed; G, baffle plate; H, absorbent wick for chloroform around central cone; I, Absorbent wick around walls of chamber.
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piece. The upper chamber is surrounded inside with wick, and also has wick round the inner cone. Both wicks touch the bottom of the upper chamber, the latter one by passing through a hole in the baffle plate. The lid is removable, but to save taking it off during the administration of the anaesthetic, a screw-on cap in the lid permits the addition of chloroform to the upper chamber. The wicks can be removed, and the whole apparatus sterilized, after which, of course, it must be thoroughly dried before the wicks are replaced.

To use the inhaler, twelve drachms of chloroform are placed in the upper chamber, which saturates both wicks and leaves a layer on the false bottom below the baffle plate, but not touching it. Care must be taken that the chloroform does not reach as high as the baffle plate, otherwise the apparatus will not work correctly. The indicator is put to zero (port closed). An ordinary gas face-piece is attached to the coned end, either directly if the patient is on his back, or if in another position by means of one of the angle pieces. The face-piece is then adjusted to the patient's face, so that the only admission of air is by the air tube. Pure air is then breathed. As the port is opened, chloroform vapour is drawn through the by-pass in the same way as air is sucked into a Bunsen burner or a Fletcher gas stove. The expirations of the patient maintain a constant temperature in the chloroform chamber, and from actual experiments at that temperature the dial on the lid is graduated to show the percentage being inhaled. In use it is found advisable to start with the port closed, indicator at zero, and to take five to ten minutes in passing gradually to 2·5 per cent, when surgical anesthesia is generally produced. A higher percentage is rarely needed. Anesthesia, when obtained, can be maintained at from one to two per cent, especially if one-twelfth of morphia and a hundredth grain of atropine are given twenty minutes prior to the induction. With this preliminary narcotic and a slow induction, the 'struggling' stage is nearly always eliminated even with robust soldiers. The only important point is to make a gas-tight joint between the face and inhaler, which can always be obtained by the use of an appropriate-sized face-piece. I recommend Barth's. Face-pieces are not included with the inhaler. I strongly recommend after induction the introduction of an airway; it ensures a free supply of air, and prevents slipping back of the tongue.

Oxygen can be given at the same time by slipping a pewter tube connected with an oxygen cylinder into the air-tube. In certain cases this has many advantages, especially if the gas is warmed.

After induction with chloroform, ether can be substituted and anesthesia thus maintained. With the indicator at full, over ten per cent is obtained; if a higher percentage is needed, four layers of gauze can be attached to the air tube and additional ether dropped on. A special frame is provided for this purpose. By this means any depth of ether anesthesia can be obtained.

After use the air-tube and chamber should be cleaned with sterile gauze.

(3) A Gradual Induction.

With the percentage chloroform inhaler this is easily obtained. For warmed ether the induction can be started with the percentage inhaler, putting in only half a drachm of chloroform, and gradually adding ether, if needful, dropping ether on gauze over the airpipe, at the end of induction, and then substituting a Skinner's mask with two layers of flannel, with a copper pipe under the flannel,
to which the warmed ether can be conveyed by a rubber tube. The copper tube
I use is attached inside the mask, and is punctured on its under surface, so that
the warmed vapour is equally distributed under the mask. The mask fits more
accurately if a piece of spongiopiline with hole for face and nose is put on the
face.

(4) **The Maintenance of a Patent Airway.**

Most of the worries of an anaesthetist are the result of mechanical obstruction
to the respiratory passage. Obstruction through mucus is eliminated by a pre-
liminary hypodermic of atropine. Falling back of the tongue is obviated by the
introduction of an airway as soon as the patient is under, and before he is brought
into the theatre. I usually put in a Bellamy Gardner mouth prop before I start

the anaesthetic, and thus can put the airway in without using a gag when the
patient is under. Care should be taken to see that the tongue is under the tube.

Colonel Silk advises the employment of a ½-inch rubber nasal tube. I have
found this useful when not employing the airway.

(5) **Uniformity of Anesthetic Dose and Anaesthesia.**

When once the patient is under, the dose should be regulated so as to maintain
a uniform degree of anesthesia. For ordinary cases the corneal reflex can be
fairly brisk, and, with watching, the patient can be maintained quite comfortable
at one to two per cent. Where there is likely to be traction on intestines, gall
bladder, uterus, or for orthopaedic wrenchings, osteotomies, etc., the patient must
be fully under. In these I abolish the corneal reflex, and, if needful, push the
anesthetic to three per cent chloroform—of course watching the respiration all
the time, and slacking back when all cause of shock is over. A regularity of
depth of anesthesia often means an absence of post-anesthetic sickness. An
irregular anesthesia, one moment light, then deep, is most dangerous.

For warmed ether, I pump air through or over ether in a Wolf bottle, and then
through a copper coil in a thermos flask filled with boiling water. This apparatus
is illustrated and can be used for intratracheal ether. Mercury blow-out is attached.
Instead of using a foot or hand bellows, oxygen may be bubbled through or
over the ether. This is most useful in cases of shock, such as orthopaedic wrench-
ings, osteotomies, or in abdominal operations when there is traction on the
intestines, gall bladder, etc.

From observation of many thousand cases, I have come to the conclusion that
the velveteen hand style of surgeon is the one who obviates shock more than another,
and that if the operator and anæsthetist are in accord, and work together, it adds
greatly to the safety of the patient.

VARICOSE ANEURYSM FOLLOWING BULLET WOUND OF ARM:
EXCISION, AND END-TO-END ANASTOMOSIS OF BRACHIAL
ARTERY.

By GEORGE L. PRESTON, F.R.C.S.E.
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PRIVATE——was admitted to the Military Hospital, Devonport, on October 18,
1916, with a history of having been wounded five months previously. Wounds at
the time healed rapidly, there was no excessive hemorrhage; progress uneventful.
On admission: There were healed wounds of the left arm 3½ to 4 inches
above the elbow joint. Entrance on inner aspect over the line of the brachial,
artery; exit wound more external at outer border of biceps. There was some
swelling about the size of a walnut in the line of the wound and the artery. The
swelling pulsed strongly, was expansile, and a well-marked thrill and bruit
were demonstrated. X-ray examination revealed nothing further, no foreign body
or injury to the bone was seen. There was also some tenderness on pressure over
the swelling, and continuous pain referred along the distribution of the median
erve in the index, middle and radial side of the ring finger of that hand. No
anæsthesia or paralysis. Radial pulse on the affected side somewhat delayed.

A diagnosis of arterio-venous aneurysm and of varicose aneurysm in particular,
with some involvement and pressure on the median nerve, was made, and opera-
tive treatment decided upon.

Operation.—Under ether anæsthesia an incision about six inches long was
made over the swelling, and by careful dissection the brachial artery and median
nerve were isolated above, and then traced downwards towards the sac. The
nerve was first dissected free from the sac, to which it was intimately adherent by
dense scar tissue, and then by working from below upwards and retracting the
biceps outwards, the nerve was completely freed, and found to be intact. The
next step consisted in freeing the vein and in suturing the lateral opening in it
with fine catgut. The sac itself was then dealt with. On laying it freely open and
removing some small clots, it was found to be bilocular—one portion being