



# Textbook of Operative Surgery

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# TEXTBOOK OF OPERATIVE SURGERY

## EXTRACT FROM PREFACE TO THE FIRST EDITION

**M**OST recently published works on operative surgery are the product of multiple authorship—the work of a number of eminent authorities, each writing on the specialty he has made his own. In support of such composite works, it is often stated that the progress of operative surgery in its many and varied branches has made the subject too vast to be covered adequately by a single author. It is with considerable diffidence, therefore, that I have approached such a task, but I have felt that there was scope for a one-volume book written by a general surgeon, and designed to present, as far as possible, the whole subject of operative surgery in balanced perspective from the viewpoint of the general surgeon in training.

With these aims in view, I have endeavoured to describe, in detail and with adequate illustrations, all the operations which the junior in general surgery is likely to undertake himself, and also the more commonly performed operations in which he may have to assist. In the specialised fields of surgery I have described in the same manner such operations as the general surgeon may at times be required to undertake when more expert help is not available.

In most sections an attempt has been made to include a short review of the surgical anatomy of the part; indications for operation, the choice of procedure, and pre- and post-operative treatment have been discussed where pertinent. Operations which are less frequently performed, and those which lie more strictly within the specialised fields, are described more briefly and in small print; the general scope and aims of the operation are discussed, but details of technique have as a rule been omitted. In this way it has been found possible to contain the work within a single volume of reasonable size.

In the specialised fields of surgery I have sought the advice of several colleagues, and their help has been invaluable to me. Many of the views, however, that I have expressed on matters pertaining to their specialties, together with the responsibilities for such, are entirely my own. I gladly acknowledge the guidance I have received from many other sources—too numerous to record individually. For descriptions of the classical and well-tried operations I have consulted freely the older works on operative surgery. For the rest, I have drawn upon recent monographs and upon articles in the current surgical literature; reference to many of these is made in footnotes.

EDINBURGH, 1954.

## PREFACE TO THE SECOND EDITION

THE warm reception accorded to this work makes me happy to believe that the aims set out in the preface to the First Edition have been achieved. Demands for this Second Edition have been unremitting, and to those friends in all parts of the world who have honoured me in this way I offer my apologies for the delay in its appearance. I believe, however, that in a single-handed work such delays are inevitable, for the demands made on a busy surgeon leave little time for authorship.

The opportunity has been taken to bring the book up to date as far as possible, and to incorporate over two hundred new illustrations. The drawings are again the work of Miss Margaret McLarty and Mr. R. W. Matthews, who have been joined by Mr. James Gordon, and I thank them all for their splendid work. The other illustrations added to this edition reflect my new-found interest in colour photography at operation, and in regard to these the publishers have been most generous. Their help in this and in all other matters (and I would particularly mention Mr. James Parker) is in accordance with the high traditions of the firm of Livingstone. To them, as before, I tender my sincere thanks.

With this edition, as with the first, my wife has worked assiduously to share with me the task of preparation. Without her help it would never have appeared, and she knows, I hope, how grateful I am.

*Eric L. Targurherson*

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EDINBURGH, 10.

*April, 1962.*

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# CHAPTER I

## OPERATIONS ON THE SKIN AND SUBCUTANEOUS TISSUES

### INCISIONS

**A**LL skin incisions should be carefully planned so as to give a good view of the deeper parts, and at the same time to avoid important structures. In general, when an incision has to be made in the neighbourhood of large vessels or nerves, it should be made parallel to, and not across, their long axis. For cosmetic reasons, however, incisions on the face or neck should be placed in a natural crease, for not only will the scar be less visible, but there will be less likelihood of keloid formation. Similar considerations arise in regard to incisions in the hand and fingers (p. 217).

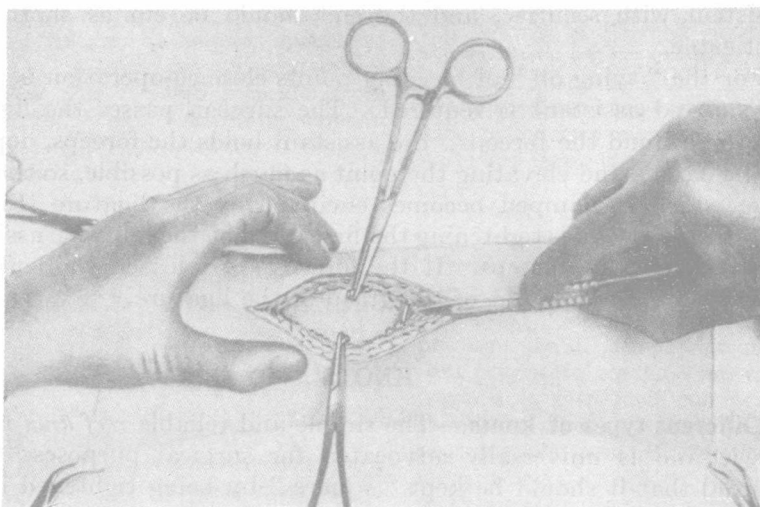


FIG. 1

Method of making skin incision and of arresting superficial hæmorrhage

A sharp knife should always be used, and the skin should be cut cleanly at one stroke throughout the distance required, the plane of the blade being held perpendicular to the skin surface (Fig. 1). Superficial and deep fascial layers are incised in a similar manner.

An incision of adequate length should always be made. Short incisions have no special cosmetic value, and they add unnecessary difficulties to the operation.

## ARREST OF HÆMORRHAGE

All bleeding points should be secured with artery forceps. In order to minimise hæmorrhage, any larger vessels which cross the line of incision should be identified and clamped between two pairs of forceps, before they are divided. Small superficial vessels are generally occluded by pressure alone, the forceps being left on for a minute or two, by *torsion* (twisting the forceps round several times), or by coagulation with the diathermy current. Larger vessels require to be ligatured or "tied off" with fine thread or catgut. Every time this is done two foreign bodies are introduced—the ligature itself and strangulated tissue beyond it. Care should therefore be taken as far as possible to clamp the vessel alone, without taking up a large mass of surrounding tissue; likewise the ligature should be of the finest material

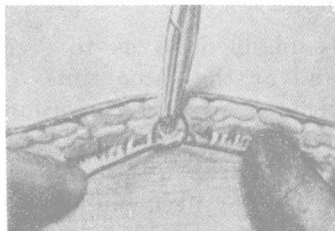


FIG. 2  
Method of "tying off" a  
bleeding point

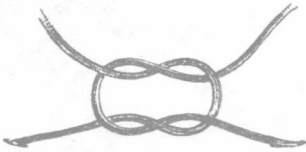
consistent with security, and the end should be cut as short as is practicable.

For the "tying off" of bleeding points close co-operation between surgeon and assistant is required. The surgeon passes the ligature material around the forceps; the assistant holds the forceps, depressing the handle and elevating the point as much as possible, so that the tissue which is clamped becomes encircled by the ligature (Fig. 2). Just as the surgeon is tightening the first hitch of the knot the assistant *slowly* releases the forceps. If the forceps are released suddenly the tissue is liable to slip out of the grasp of the ligature.

## KNOTS

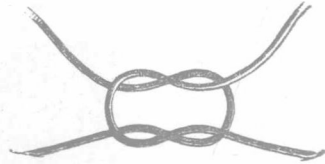
**Different types of knots.**—The simple and reliable *reef knot* is well known, and is universally advocated for surgical purposes. It is essential that it should be kept "square" by being tightened in the correct directions, for an insecure slip-knot results if this precaution is not observed (Fig. 3). When slippery suture material such as catgut, silkworm gut or waxed thread is used, the ends should not be cut too short or the knot may slip. The *triple knot* is a modification of the reef knot giving additional security, and allows the ends to be cut very short. The *surgeon's knot* is best suited to the ligation of large vessels and pedicles, when thicker ligature material is employed. It is rather liable to cause the breaking of fine ligatures.

**Tying knots with the left hand.**—This easily learned accomplishment saves much time, especially in the tying of sutures, since there is then no need to lay down the needle, which is held throughout in the



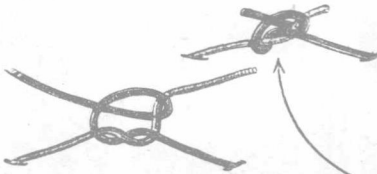
A "GRANNY" KNOT

An unsafe knot, which should never be used.



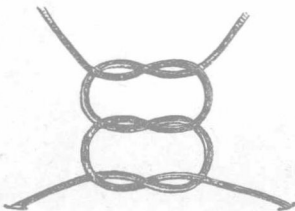
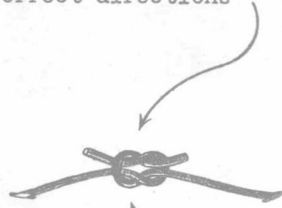
A REEF KNOT

Must be kept "square" by tightening in the correct directions

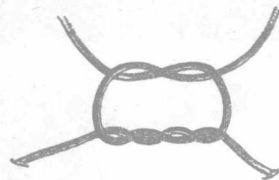


A Reef Knot - spoiled by careless tightening, so that an insecure knot results

The red strand should be pulled to the right, the blue to the left.



TRIPLE KNOT



"SURGEON'S KNOT"

with an extra turn to the first loop.

FIG. 3

Different varieties of knots

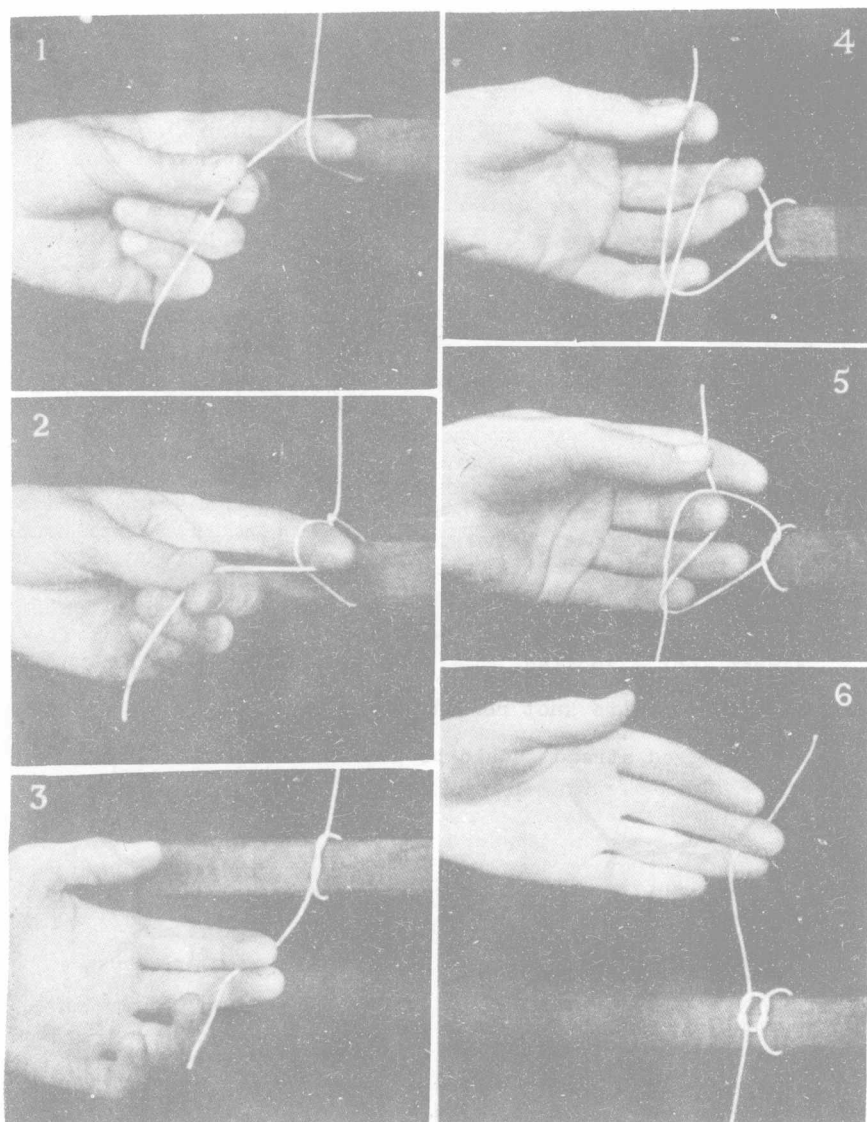


FIG. 4

Method of tying a reef knot with the left hand. Note how the knot is kept "square" by tightening in the correct directions. (The end of suture material passing off the edge of each photograph is held in the right hand)

right hand. It is useful, both for the initial knot of a continuous suture, and for interrupted sutures, when several of these can be obtained from the one length of material.

It is important to tie a reef knot, and to keep this "square" by tightening it in the correct manner. A satisfactory technique is shown in Fig. 4.

## METHODS OF SUTURING THE SKIN

After most operation wounds, except where sepsis or potential sepsis is encountered, the skin incision is closed by suture, in an attempt to obtain healing by first intention. One of the commonest

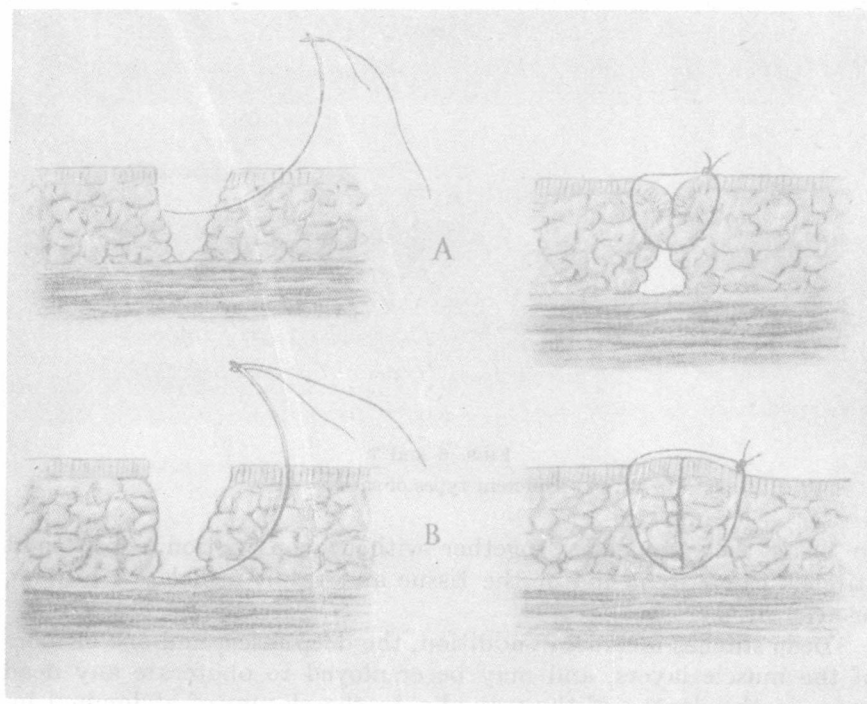


FIG. 5

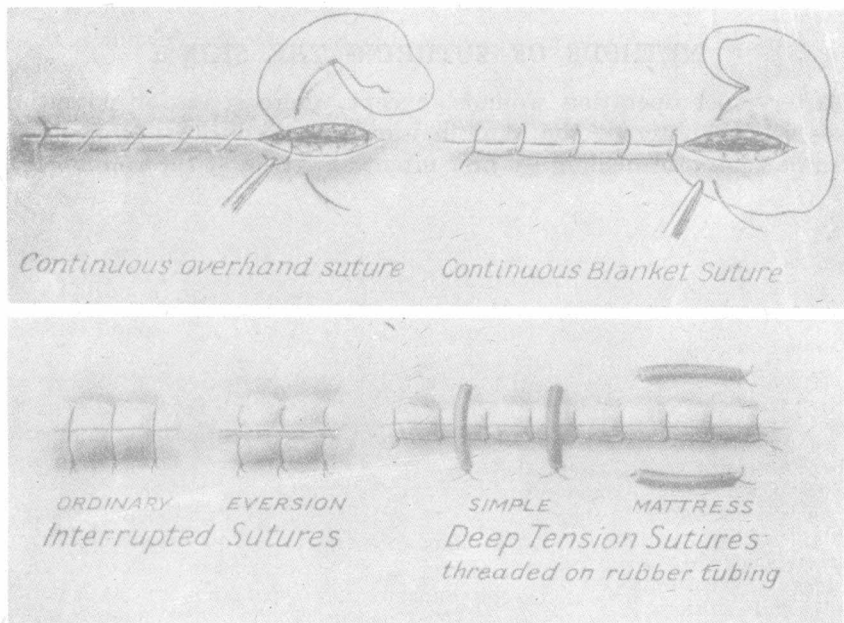
### Superficial sutures

A. Incorrect method—resulting in inversion of the skin edges, and the leaving of dead space in the wound. B. Correct method. The needle is introduced vertically through the skin, and traverses the entire thickness of subcutaneous tissue

causes of failure of such healing is imperfect hæmostasis, for the formation of a hæmatoma within the wound prevents accurate coaptation of the cut surfaces and predisposes to infection. All bleeding vessels must therefore be dealt with before skin stitches are inserted. Should it be impossible to obtain complete arrest of bleeding, or should

further bleeding be expected, the wound should be drained. The suture, of accidental wounds is discussed on page 257.

**Superficial stitches** normally include only the skin and subcutaneous tissue. The needle should be made to pass perpendicularly through the skin, in order that inversion of the edges may be avoided (Fig. 5), and the stitches should be tied with only sufficient tightness



FIGS. 6 and 7  
Different types of suture

to bring the skin edges together without constriction. Too tight stitches cause ischæmia of the tissue and result in delayed healing, or even in necrosis.

**Deep stitches** include, in addition, the deep fascia and one or more of the muscle layers, and may be employed to obliterate any dead space in the depths of the wound. In the closure of abdominal incisions (where they may be referred to as *tension sutures*), they transfer the tension from the healing margins to tissues farther away. Such sutures should always be tied loosely to allow for the normal reactionary swelling of the wound. To prevent cutting of the skin, the parts of the sutures lying on the surface may be threaded on to short lengths of rubber tubing (Fig. 7), or the sutures may be tied over a swab to produce an "anchored dressing."

**Suture material.**—Non-absorbent material with a smooth surface is generally used for skin sutures. Fine silkworm gut or nylon, horse hair, waxed thread or very fine stainless steel wire are satisfactory

for superficial sutures. Alternatively, Michel clips (Fig. 8) may be preferred. For deep sutures thick silkworm gut, nylon or stainless steel wire are in general use.

**Needles.**—Except in certain situations, an ordinary round-bodied needle is not easily thrust through skin. Skin needles are usually triangular on cross-section ("skin-cutting"), or have spear- or

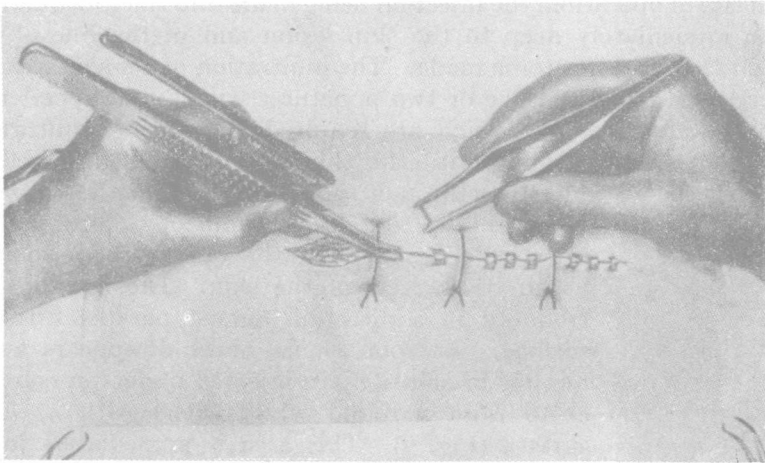


FIG. 8

Deep sutures combined with Michel clips

bayonet-shaped points. Straight or curved needles are employed according to individual preference.

**Types of suture.**—The various types of skin stitches in common use are shown in Figs. 6 and 7, the choice again depending on individual preference. Superficial sutures may be either continuous or interrupted. Deep sutures are usually interrupted. Continuous suture saves much time in the closure of a long wound, but has the minor disadvantage that, should infection or hæmatoma formation occur, it is difficult to remove a part of the suture line for drainage purposes without the remainder becoming undone. All knots are placed to lie at one side of the wound, so that they do not become buried in the healing scar.

## SIMPLE TUMOURS AND CYSTS OF THE SUPERFICIAL TISSUES

**Local anæsthesia.**—For minor operations on the skin and superficial structures a local anæsthetic has many advantages. It is the least toxic of all anæsthetics and has no after-effects, so that the patient can resume full activity immediately afterwards.

The drug in most frequent use is *procaine*, or one of its proprietary forms—*novocaine*, *kerocaine*, *planocaine*, etc.,  $\frac{1}{2}$  to 2 per cent.

solution is commonly employed. A small quantity of adrenaline (5–10 minims) may with advantage be added to the solution. By its vaso-constrictor properties it enhances the effect of the local anæsthetic, and at the same time prolongs its action by retarding its absorption into the circulation. It is essential that all solutions should be freshly prepared.

*Infiltration anæsthesia* aims at paralysing the nerve endings at the actual site of operation, the injection being made into the subcutaneous tissues immediately deep to the skin lesion and in the line of any incision that requires to be made. The infiltration of a small area can be carried out through one or two punctures with a fine hypodermic needle. Large needles, which are required for a wide infiltration, should not be introduced until the skin has been anæsthetised by injection through a fine needle. The best way of doing this is to raise a cutaneous wheal by the injection of a small quantity of anæsthetic solution within the layers of the skin. The needle is introduced in a direction almost parallel with the surface. As soon as its bevel disappears a few minims of solution are injected under pressure, so as to raise a round white wheal with a pitted surface (Fig. 9). This area is immediately insensitive. Further wheals are raised according to the extent of the infiltration required.

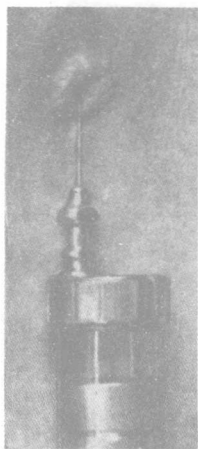


FIG. 9

The raising of a cutaneous wheal

*Field block.*—By this method the anæsthetic solution is injected into the tissues at some distance from the actual site of operation, so that a zone of anæsthesia is created surrounding the operation area (Fig. 11). A fairly long needle is required for the injection, and a suitable number of skin wheals are raised for its insertion. It usually suffices to make the injection into the subcutaneous tissue alone, but in certain cases it may be advisable to infiltrate the muscle or other tissue lying deep to the lesion. Before any injection is made into the deeper tissues an aspiration test should be made, in order to ensure that the needle has not entered a blood vessel. The injection is then made while the needle is slowly withdrawn. Field block has advantages over infiltration anæsthesia in that the lesion is not obscured by local swelling, and there is less interference with wound healing.

**Sebaceous cysts.**—These arise in the deeper layers of the skin, and are commonest on the scalp and on the back. As they increase in size the overlying skin becomes thinned-out and may ulcerate.

In the case of small cysts where the overlying skin is healthy a linear incision is employed. If the cyst is markedly protuberant, or if the skin is thin and unhealthy, an elliptical segment of skin



should be removed along with the cyst. The skin overlying the cyst is raised by careful dissection (Fig. 12); thereafter the cyst can be shelled out without difficulty. An alternative method—that of *avulsion*—is particularly suited to the removal of sebaceous cysts on the scalp. A comparatively small incision is required, and the skin is raised for a short distance on one side only. The cyst is then

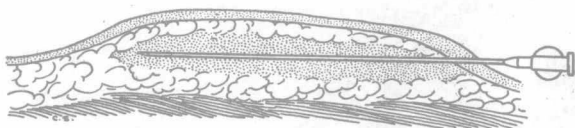


FIG. 10

Subcutaneous infiltration (Minnitt & Gillies—by kind permission\*)

deliberately opened and the contents squeezed out. A pair of non-toothed dissecting forceps, with one blade outside the cyst and one blade within, is insinuated round the side of the cyst wall until this can be grasped at its deepest part, which is much tougher than the superficial part and will not tear easily. By traction on the forceps

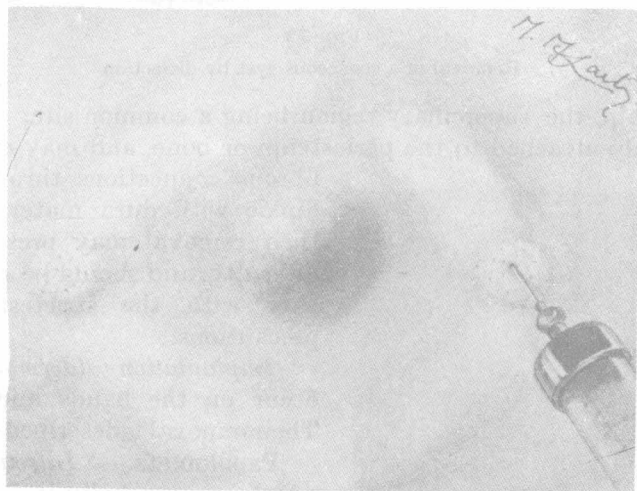


FIG. 11

Local anaesthesia by field block

(Fig. 13), aided possibly by a few touches of the knife, the entire cyst wall can usually be avulsed with ease.

The wound is sutured, and a pressure dressing is applied to prevent hæmatoma formation in the cavity. In the case of large cysts drainage for 24 hours may be advisable.

*Infected sebaceous cysts.*—If any inflammation is present, removal of the cyst should always be deferred until this has subsided. If an

\* *Textbook of Anaesthetics* (E. & S. Livingstone Ltd.), 1948.