

TREATMENT OF GUNSHOT WOUNDS BY EXCISION AND PRIMARY SUTURE.

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THE number of cases of gunshot wounds to which treatment by excision and primary suture is applicable affords ample justification for attempting to make the method more widely known and popular.

I began this method of treatment of certain lacerated "furrow" wounds in November, 1914, and was so impressed by its utility that I have since then urged that it should be carried out whenever possible.

The advantages claimed for its use are:

1. Healing by first intention is assured in the vast majority of properly selected cases.

2. Much time is thereby saved. Some wounds, which would otherwise require months to heal, are soundly united in the course of ten to fourteen days. The soldier is thus available for duty again at a much earlier date.

3. The amount of attention required to be given by the medical officers and nursing sisters, etc., is greatly reduced.

4. Much pain is avoided.

5. The amount of dressings required is reduced to a minimum, and in this way expense is lessened.

6. Complications which may arise from the presence of a septic wound are avoided.

7. A more slightly scar is obtained.

8. Because of the absence of contraction which would accompany formation of a large cicatrix, there is less impairment of function in the part concerned.

9. In the case of head injuries, excision of the wound, especially in some, apparently trivial, injuries, provides a means of ascertaining, with greater certainty than by any other method, whether depressed fracture or injury to the brain coexists.

Healing by first intention may be procured in practically all cases in which the surfaces of the new wound can be brought into accurate approximation without much tension. In rare cases, when the wound is deep, approximation in the depth has to be dispensed with and drains are introduced for a short period—until one is assured that aseptic healing will occur. In some cases it is necessary to adjust and fix the parts of the body adjacent to the sutured wound so that the fullest relaxation is secured.

The mere length of a wound is no bar to operation. Some very long wounds have been excised. A missile may inflict what resembles an incised wound, but, by dividing the tissues at right angles to the line of their greatest tension, may, owing to the contractility of these tissues, cause a large gaping wound. In such cases there will be little tension when sutures are inserted and tied, if too great a mass has not to be excised. One can test roughly what the amount of such tension will be by attempting to push the surfaces of the wound together.

It is not necessary to wait until the wound is surgically clean—in fact, in most cases the sooner the excision is made the better. The wound will probably be soundly healed in a shorter time than it will take to clean. During the "cleaning" process the adjacent parts become so softened that sutures do not hold well. Only when a large "bank" of inflamed tissue surrounds the wound is immediate excision inadvisable on account of the septic condition of the wound. In such cases it is probable that organisms have penetrated to a considerable depth, and will cause trouble when the tissues invaded by them are subjected to the pressure of sutures. By vigorous "salting" (hypertonic treatment) such wounds are usually rendered suitable for excision in twenty-four to forty-eight hours.

Other contraindications are the presence of marked pocketing in the wound and the exposure of vascular or nerve trunks in the depth or of bone which it is inadvisable or impossible to remove.

In any case excision of the soiled edges of skin and of the superficial connective tissue and muscle may be done with advantage. The healing process in the wound as a

whole is thereby accelerated. Certain bony prominences—such as a vertebral spine or the edge of the acromion process—may be capable of removal with the other infected tissues.

The presence of pocketing in a wound is very important. If part of such a pocket, or, indeed, if any septic focus be left, the operation will probably prove a failure. The technique is therefore very important. The operation can usually be done under infiltration anaesthesia of the neighbouring parts. It is well to add plenty of adrenalin to the anaesthetic solution, so that haemorrhage during the operation is avoided. Accurate haemostasis is important for success. The parts around are shaved and disinfected very thoroughly. The wound is wiped out, dried, and packed with gauze.

For disinfecting purposes in these cases I favour the use of very strong iodine solution (5 to 10 per cent. in spirit or ether). This is painted thoroughly into every part of the wound and over the surrounding skin for a considerable area. It has the effect of drying the surface of the wound in a remarkable manner. The strong iodine is wiped off the skin with spirit or ether at the end of the operation.

The skin close to each extremity of the wound is caught up by tissue forceps or a loop of thread, and slight traction is made in a direction away from the centre of the wound at an angle of about 45 degrees with the sound skin. The whole wound is then cut away *en masse* (skin, flesh, and, if necessary, bone) at a distance of about one-third to half an inch from the raw surface. Care must be taken that pockets or general surfaces of the wound are not cut into during this procedure. Bony prominences are removed along with the soft parts by dividing them with bone-pliers, gouge-forceps, or chisel.

If the wound is deep, it is sometimes of advantage to insert the finger into the wound as a guide to where the tissues must be divided.

A very sharp scalpel is invaluable. Cutting out the wound in pieces makes success precarious.

The new wound surfaces should now be washed with saline solution and packed with gauze, and the surrounding skin wiped free of blood or discharge.

Fresh towels, fresh instruments, and, if the wound has been handled, fresh gloves should now be used. The wound should be closed by wide sutures which underrun its floor so that no dead spaces are left. It may be necessary to suture in layers. If so, the suture of each layer should include some of the tissue of the deeper layer. The skin should be accurately approximated by a few fine sutures. Further relaxation sutures are not often necessary.

The following dressing should then be applied. The line of sutures and the adjacent skin for several inches should be painted with a wound varnish, of which mastic, dissolved in some rapidly evaporating solvent, forms the important part (40 to 50 per cent.). When the varnish has become "sticky" (after one and a half to two minutes), a covering of gauze, at least two layers thick, should be stretched tightly and smoothly over the sticky area, gently patted down, and cotton-wool and bandages applied fairly firmly. If it is desired to inspect the wound at any time, after removing the bandage and wool, the top layer, or layers, of gauze should be peeled off by traction at right angles to the surface, the layer next the skin and wound being at the same time retained by the other hand. Perfectly satisfactory inspection can be made through the single layer of gauze. The loose edges of the gauze should be neatly trimmed.

In many cases no further dressing is required until the stitches are to be removed. The final layer of gauze is then peeled off.

If fine catgut sutures have been used for the skin, it is often found that the knots come away with the layer of gauze, the deeper parts having been digested. A fresh application of the mastic varnish and gauze should then be made and left until the wound is firmly healed.

The varnish should on no account be painted over the gauze after it has been applied, otherwise the gauze cannot be peeled off as described.

The varnish and gauze dressing is important for success. It is the best I know. It gives wide support, relieves tension, and prevents any dragging on the stitches. These factors are of great value in preventing stitch abscess.