be used every time, and that can be worked hard from the beginning without having to wait till the tube is seasoned before any serious work can be done. But in the future the Coolidge tube will doubtless play an important part in therapy.

The diseased area is generally placed at a distance of 15 cm. from the target, and a filter of 2 mm. aluminium used with or without an additional fabric filter, which is often the patient's clothes. The pastille is always covered with the same filter, and 1 pastille or 10 X Kienbock given. The tube is generally at 8 Benoist and worked at 2 m.a. If the area is large it is divided into two or more, each of which receives this dose. If it can be approached by cross fire this is always done, and glass funnels are used for the mouth or vagina. I use one of the standard tube boxes and holders, but instead of having a straight lever attaching the box to the arm, I use one bent at a right angle, so that the long axis of the tube instead of being vertical is horizontal, as in the vertical position the cathode stem is always coming into contact with some part of the patient's body; with the axis horizontal this is avoided. I nearly always treat the patient while sitting, and have a special chair, made like the laryngological chair with back rest, but having clamps for the back rest at each side as well as in the middle of the chair. In this way the head can be made to bend over in a restful position on to one of the lateral rests, so that the tube box can fit into the widened hollow of the neck.

I should emphasize the great value of the use of x rays as a prophylactic after operations for primary, and especially after recurrent, growths. In cases of recurrence, the question before the surgeon's mind should always be: Shall I hand over to the radiologist at once, or operate and then hand over? In many cases of recurrence x rays without operation would be better, for to disturb the lymph channels is always a dangerous proceeding except in primary operation, in which case one can get apparently quite clear of the infected area.

The ideal practice would be to radiate the open wound with a good stiff dose of rays, in which case they would get direct access to any danger cells that might lurk on or near the cut surfaces. It is a question whether it would not be well worth the extra trouble and the risk of disturbing the aseptis of the wound and of the prolongation of the anaesthetic. Better have a coccus or two in the wound than a cancer cell or two!

But in any case systematic prophylactic after-treatment would give much better results after operation, and if an operation were done for recurrence it should be done with the cautery and not the knife, and the cold cautery of diathermy seems to be the best of all. Also, if x rays are to be given in recurrences, they should be used at once. Delay in radiation in such cases is as dangerous as delay in operation in primary cases. Wherever there is recurrence there is much greater danger of subsequent recurrences than in the primary operation, and it appears to me to be the duty of any surgeon who has any faith in radiation to have his recurrent cases radiated at once, even if he demurs to the same treatment after primary operations.

The general position is that on the whole we have not quite succeeded in curing the majority of our likely cases, but, in spite of disappointments, the possibility of attainment becomes nearer, and some day, if we persevere, we may turn the corner, make some change in instrumentation or technique, and the goal may come in sight.

MALIGNANT OEDEMA.

BY

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THE following conclusions are based upon a recent series of 11 cases treated in No. 2 Canadian Stationary Hospital, Le Touquet, France. Apart from actual mechanical damage to the tissues, there is perhaps no other disease in the present war which presents such dramatic awfulness as malignant oedema (septic gangrene). Its onset is so rapid and its result so disastrous that, if the surgeon wishes to save his patient, he has no time to lose from the moment his diagnosis is, not apparent, but suspected.

In other wars the mortality of malignant oedema has reached as high as 90 per cent., and yet I believe, if the treatment is instituted early enough, the mortality should be nil.

Symptoms.

The disease, we find, most frequently originates in a large bullet or shell wound, usually deep in the channel of exit. Its onset is insidious but rapid, and not especially painful. The wound is black, instead of red, and at first appears to be filled with decomposing blood clot, from which on, or sometimes without, pressure bubbles of gas issue. In a few hours the wound may present one of two phases—it either becomes dry and black, having an appearance of being seared with the actual cautery, or in other cases it presents a dark greyish slough not unlike diphtheritic membrane. The surrounding skin for several inches is often dark in colour, a smooth spreading pseudo-ecchymosis about the colour of iodine stain. It does not present the mottled appearance of true ecchymosis. The limits of the colour usually mark the extent of the disease. At the end of twenty-four hours the limb commences to swell, owing to gas in the tissues, and in a few hours becomes markedly oedematous. On pressure one can sometimes, but not always, elicit gas crepitus. The limb gradually becomes enormously enlarged and the skin is drawn taut, presenting a shiny appearance. There is one characteristic symptom prominent above all others, and unmistakable when once encountered: a vile pungent odour of remarkable penetrating power, capable of permeating a large hospital ward. It can only be compared to the odour of dead blood in a large cavity when scented at close range, but intensified a hundred-fold.

At the end of forty-eight hours, if the patient lives so long, the face assumes a sickly greenish pallor, and the expression becomes anxious. There is no change in the mentality. Patients remain rational to the last. The pulse presents the usual features of grave toxæmia. The temperature ranged in the cases under my observation from 100° to 105° F., and the pulse and respirations were in direct ratio to the temperature. It is quite likely the high temperature is due to complicating staphylococcal organisms, for in the most severe case of all, which, by the way, recovered, the maximum never exceeded 101° F. The pulse ranged from 104 to 128, unusually high in this series.

Treatment.

The necessity for the following treatment being carried out in detail is illustrated by the fact that we lost our first case—a skin wound only of the upper arm—because we treated it superficially. Two cases were moribund on entry, and died in a few hours. One case had a badly shattered limb, and was saved by amputation. The other seven cases recovered. It is necessary to make immediate and deep incisions down to the bone, under chloroform, by means of a 6 in. blade amputation knife. These incisions were, in the cases at Le Touquet, 4 to 6 in. in length. They were afterwards kept wide open with fenestrated rubber tubes, 1 in. in diameter, passed on transversely through the muscle to a counter incision. Not less than three, and in one case six, large openings, were made. The wounds were irrigated with solutions of hydrogen peroxide of the ordinary strength, followed by a mixture of the same solution with an equal quantity of carbolic acid 1 in 100. The wounds were also lightly packed with gauze. Dressings and irrigation were repeated every three hours. A high cradle was placed over the wounded part so as to admit plenty of air. After a few hours (as soon as checking of bleeding would permit) the gauze drainage was removed and only a thin layer of gauze left to cover the wound. It is quite possible that had these wounds been exposed for hours to direct sunlight we should have had a more rapid result.

The wounds have a great tendency to close in a few hours, and this, unless prevented by the surgeon, will bring about the anaerobic conditions we are trying to avoid. A pair of forceps and the moving about of the rubber tubes will prevent this accident. Night and day special nurses were employed, and since the adoption of this system of treatment (in the last seven cases) we have had no deaths. Recovery took five to seven days.