(1) Under present conditions in Malaya, with penicillin available in sufficient dosage and supplemented if necessary by the newer antibiotics, wound infection can be so greatly retarded as to make the time element, from this aspect, no longer important. Under favourable conditions serious wound infection should be almost eliminated.

(2) Some wounds are of course lethal, killing either immediately or very soon after wounding. There is little that can be done about these except to try to reduce their incidence by good battle-training and possibly by some form of protection such as the laminated nylon vest. The great majority of deaths from wounds, not of themselves necessarily lethal, occur directly or indirectly from haemorrhage. This must be regarded as a preventable condition, and efforts to reduce mortality from missile wounds can be directed with much profit along these lines. The three main life-saving procedures in such cases are adequate first aid to limit bleeding from accessible sites; quick adequate blood replacement for cases with oligæmic shock, actual or imminent; and speedy evacuation to a surgical centre of any case with inaccessible bleeding. There is nothing new about these fundamental principles; nevertheless, many of the deaths in the series under review were due either to failure or to inability to apply them. They cannot be restated too often.

(3) Helicopter evacuation has come to stay. It will not always be available, because we are unlikely always to have the local air superiority essential for the operation of these vulnerable aircraft. When they can be used, however, they are life-saving and should be the normal method by which penetrating wounds of the head, spine, chest, and abdomen, maxillo-facial wounds, and those involving the femur or major vessels are evacuated. Apart from the time saved and the minimization of shock while in transit, they have the tremendous advantage that, once airborne, they can cover considerable distances quickly and so enable serious cases to be operated on well in the rear, where adequate surgical and nursing facilities can be provided and the need for subsequent speedy evacuation is less urgent.

Any report on war surgery in Malaya would be incomplete without a tribute to all ranks of the Army Medical Services responsible for the management of these cases. Despite constant shortages of staff which necessitated long hours of work, their efforts have been tireless, and the fact that the results obtained are the best in the history of the British Army is entirely due to the high quality of their team-work. In particular we have been indebted to the junior surgeons and anaesthetists, without whom it would have been impossible to carry on.

Summary

Missile wounds in 774 casualties sustained during a three-year period in Malaya are reviewed. The mortality among cases alive on admission to hospital was 5.5% and among cases fit for surgery 3.7%.

Management of wounds followed the principles developed during the second world war and confirmed their soundness.

The causes of death are discussed and suggestions made for reducing them.

I am indebted to Brigadier C. W. Greenway, Director of Medical Services, Far East Land Forces, for permission to send these notes for publication.

SPEECH AFTER REMOVAL OF UPPER END OF OESOPHAGUS AND THE LARYNX

BY

A. C. DORNHORST, M.D., M.R.C.P.

Reader in Medicine, St. Thomas's Hospital Medical School, London

AND

V. E. NEGUS, D.Sc., M.S., F.R.C.S.

Consulting Surgeon to King's College Hospital, London

The disease generally known as post-cricoid carcinoma usually arises on the upper surface of the cricopharyngeal fold at the mouth of the oesophagus. The incidence is, unfortunately, of sufficient frequency to present a serious problem in treatment. The growth tends to infiltrate the back of the larynx and is usually far advanced before compelling the patient to seek advice; its progress is such as to inflict great suffer-

FIG. 1.—Recording of respiratory movements, oesophageal pressure, and sounds while patient counts up to eight. Each sound occurs as the oesophageal pressure rises during a sharp expiratory movement.

FIG. 2.—Upper part of oesophagus and the reconstituted pharynx, showing the falling together of the anterior and posterior walls at about the upper limit of the graft. A, during speech. B, after speaking. The junction of skin tube and oesophagus is widely open during speech; the skin tube is distended by escaping air.

ing, because of difficulty in swallowing, pain, cachexia, and changes in the voice, sometimes with difficulty in breathing.

Many years of sad experience have emphasized the necessity for drastic treatment if the patient is to be spared a slow and distressing death. Several conclusions have been reached. They are that irradiation is ineffective; that limited operations, with preservation of the larynx, are very rarely effective; and that removal of the upper end of the oesophagus must be accompanied by excision of the larynx, with part of the pharynx. The complete operation should be performed at the earliest possible moment after establishment of a diagnosis, before the progressively infiltrating growth has further opportunities of spreading. The operation must be truly radical, with block dissection of glands, complete or partial according to distribution of the primary growth or metastases. And, finally, immediate restoration of the food passage should be attained, the method adopted being the introduction of a specially shaped tube of rubber or plastic material, covered with a split-thickness skin graft.

It is well recognized that strictures may subsequently occur, but their relief does not present undue difficulties if a suitable plastic operation is performed. Objections to radical operation have in the past been based on the immediate dangers, on the probability of recurrence, and on the loss of speech. Even if the drastic one-stage procedure advocated is adopted the operative mortality should be slight; the prospects of cure are sufficient to afford a reason for its performance. The possibility of speech is illustrated by the following case.

Case Report

A woman aged 46 at the time of operation five years ago was subjected to the method described; while retaining a plastic tube through which she swallowed, she led an active life and drove her motor-car vigorously. Stricture formation at the junction of skin tube and oesophagus required plastic repair, carried out by Mr. Moore, plastic surgeon to King's College Hospital. She now takes ordinary meals, although requiring a drink of water at times to assist the passage of food through the non-muscular skin tube. Lessons in speech education were given by Miss Swallow, but full credit must be given to the patient herself for her determined and prolonged efforts to talk, with so successful a result that she can converse freely and is easily understood even on a telephone. At a meeting of the Association of Plastic Surgeons in February, 1953, the patient was audible at the back of the hall (Negus, 1953).

Comment

Investigation of the mechanism of speech has been carried out by the method of Bateman, Dornhorst, and Leathart (1952). It appears, from the records obtained, that her speech is essentially similar to that after simple laryngectomy (Fig. 1), except that the production of sound is at the junction of skin tube and pharynx where the anterior and posterior walls fall together, and not at the level of the crico-pharyngeal sphincter, the latter having been completely removed at operation. Radiological examination while swallowing barium showed a sufficiently wide food passage at all levels; the narrowing visible in the film reproduced here (Fig. 2) seems to depend on contraction of the remaining fibres of the pharyngeal constrictor muscle, and offers no impediment to the passage of food. Although during normal breathing the oesophagus contained air, the narrowing was enough to prevent free oesophageal respiration, and, during the expiratory

efforts of speech, sufficient resistance was presented to outgoing air to allow the production of sound. The patient had an advantage over one with a simple laryngectomy in that no special knack of filling the oesophagus with air had to be acquired, and she herself said that all she had to do to make a sound was to attempt to shout.

It may be that the exact form of the graft which allowed sound production was a fortunate chance. Further patients will have to be examined to check this. If necessary, there should be no insuperable difficulty in imitating in others the anatomical features found in this patient.

We feel that the demonstration of efficient speech in this patient should be an encouragement to others, and an indication that with sufficient application the acquisition of a voice is a possibility.

We thank Dr. Gordon Gryspeerdt for radiological help.

REFERENCES

- Bateman, G. H., Dornhorst, A. C., and Leathart, G. L. (1952). *British Medical Journal*, 2, 1177.
Negus, V. E. (1953). *Brit. J. plast. Surg.*, 6, 99.

A PLASTIC SURGICAL DRESSING

BY

C. G. ROB, M.C., M.Chir., F.R.C.S.

AND

H. H. G. EASTCOTT, M.S., F.R.C.S.

Surgical Unit, St. Mary's Hospital, London, W.2

The rising costs of gauze and absorbent wool have stimulated a search for an alternative dressing for surgical and other wounds. The object of this paper is to record our experiences with a liquid plastic dressing ("nobecutane"), which is an acrylic resin dissolved in a mixture of acetic esters (Hogeman and Olow, 1953). This dressing has been the only covering for 200 clean surgical wounds.

Method of Application

At the conclusion of the operation, after the last skin suture has been tied, the wound is wiped clean and then dried with a dry gauze swab. The plastic is applied with a brush, a plastic applicator, or a spray. A film forms over the whole wound and dries in about three minutes; the patient is then ready to return to the ward. About 2 to 3 ml. of the liquid plastic has proved to be sufficient for the average abdominal incision. Provided that the wound is adequately covered, a thin layer is preferable to a thick one. We found the spray to be the most convenient method of application and the most economical. The plastic applicator provided a satisfactory alternative, but application with a brush was too wasteful, and with this method 10 ml. was required for an incision 6 in. (15 cm.) long.

The plastic forms an elastic, transparent, and adherent dressing which remains in position until the skin sutures need removal. It is then peeled off with forceps and the sutures are removed in the usual way. In some of our cases we applied the plastic to the skin of the operation site before operation and then operated through it, making a further application at the conclusion of the operation. This was unsatisfactory, because portions of the plastic film tended to flake away from the skin edge and fall into the incision.

Disadvantages

In the liquid state this plastic is inflammable, but not once it has dried as a film over the wound. It is painful