Current Practice

Infections of the Hand—1

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During the last 16 years in the casualty department of the General Infirmary at Leeds the number of infected hands treated by operation has remained steady at about 1,000 per year. The majority of these have been healed within a week after operation. But there are still too many in which the infection is so widespread that healing is long delayed and in which the tissue destruction is so great that there is some disability after healing. The reason for this widespread infection is almost invariably that conservative treatment has been carried on for too long. In order to treat the infected hand efficiently, therefore, we must be familiar with what conservative treatment can do and, even more important, what it cannot do.

Conservative Treatment

Excluding old-fashioned "salves" and ointments, the two most common forms of conservative treatment are heat and antibiotics.

Heat Treatment

This is usually by fomentations, hot soaks, or kaolin poultices. Without doubt, the application of heat to the painful part relieves the pain. Analgesics are probably more effective. I have yet to be convinced that heat has any direct therapeutic action. It is argued that the heat will dilate the vessels and bring more blood, with its accompanying antibodies to attack the infection. The vessels are already dilated, and the throbbing of these dilated vessels in the infected finger can easily be felt by the examining surgeon's own fingers.

Another argument for the continued use of heat treatment is that it will "draw" the infection to the surface and make it "ripe" for incision. The only way deep infection can reach the surface is by destroying the tissues superficial to it. Since we wish to prevent any unnecessary destruction of tissue, "drawing" the infection is immediately condemned.

Antibiotics

In the very early stage of infection adequate doses of antibiotics will overcome the infection. We see at least one patient every week where we do overcome the infection in this manner. The dose of antibiotic must be large, and penicillin by mouth rarely produces an adequate titre. We use an injection of 600,000 units of procaine penicillin combined with 200,000 units of crystalline penicillin. If tetracyclines are indicated, a loading dose of 500 mg. is given, followed by 250 mg. six-hourly. If these antibiotics are overcoming the infection, then by the end of 24 hours, or at most 48 hours, pain and other signs of inflammation should almost have disappeared. There is no justification for giving a patient a supply of antibiotics for five days (with a tin of kaolin for good measure) and asking him to report again then.

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Contraindication to Conservative Treatment

As soon as pus is diagnosed as being present it should be evacuated without delay. The pus may be actually beneath the skin. When the pus lies deep it will cause considerable pain. If the pain is such that it causes considerable interference with sleep, then pus is certainly present. In 16 years I have only failed to find pus once, observing this rule. Antibiotics will not dissolve pus. If treatment by antibiotics for 24 hours, or at most 48 hours, has not caused diminution of pain and of other signs of inflammation, pus is present and should be evacuated.

Operative Treatment

Before considering details of operative treatment in special sites it is perhaps worth while to enumerate certain general principles.

Antibiotic Cover

All operations should be carried out under antibiotic cover. Although antibiotics will not cure, they will prevent pus from infecting healthy tissue as it is being evacuated.

Routinely we use penicillin (600,000 units procaine + 200,000 crystalline) injected half to one hour before the operation, at which time it is at its maximum concentration in the blood, of 4–8 units per ml. If the patient is sensitive to penicillin, 100 mg. of soluble oxytetracycline is injected. If antibiotics are given by mouth, absorption is so variable that there is no guarantee that there will be an adequate concentration at the time of operation.

Instruments

The following instruments are required: A knife with a small blade—No. 10 or No. 15. Toothed dissecting forceps. Two sizes of small curettes or Volkmann's spoons. A pair of "nibbling" forceps to remove very adherent slough. (These are similar in pattern to those used by the neurosurgeons for nibbling away the skull, but are of a size suitable for fingers and hands. They are supplied to us by Thackray's of Leeds.) A "lead" hand. This is a sheet of lead about $\frac{1}{8}$ inch (3.2 mm.) thick, in the shape of a hand, with "fingers" long enough to bend over the patient's fingers, thereby controlling the tendency to curl up under general anaesthesia. Any hospital workshop could produce one.

Anaesthesia

(a) *Local Anaesthesia*.—Operations on the distal two segments of the fingers can well be carried out under local anaesthesia. Two millilitres of 1% lignocaine without adrenaline are injected into each side of the base of the finger. With the modern, very sharp, disposable needles this can be done with

no upset, except to the most nervous of patients. Surgical dressers are taught to do this in my department. It is their pride that very early in their month's appointment to the casualty department they can give this injection neatly and efficiently, and that by the end of ten minutes the finger is perfectly anaesthetized. For the thumb, a more widespread injection is usually necessary and about 6 ml. of solution is required.

For lesions in the proximal part of the fingers and in the palm we rarely use local anaesthesia. Attempts at block anaesthesia by injection around the median and ulnar nerves at the wrist and infiltration in the dorsum have been found too often unsatisfactory, even by skilled anaesthetists. We never use them now. Brachial plexus blocks in the axilla by a skilled anaesthetist have been found satisfactory where general anaesthesia is not desirable. But this form of anaesthesia is time-consuming and general anaesthesia is more desirable.

(b) *General Anaesthesia*.—If a general anaesthetic is indicated, it should be such that the patient is unconscious and relaxed, so that a deliberate operation can be performed. It is impossible to carry out an efficient operation on the hand of the struggling, although unconscious, patient produced by the old-style gas and oxygen anaesthesia. Our anaesthetists use a sleep-dose of intravenous methohexitone followed on by halothane. This produces rapid anaesthesia with full relaxation, followed by rapid recovery without nausea.

Tourniquet

Many authors recommend the use of a tourniquet at the base of the fingers or a pneumatic tourniquet on the arm for these operations on the hand. We do not use them as routine. For the very small abscesses they are unnecessary. For larger abscesses, when slough has often to be removed, the sign of

complete removal is the healthy tissues from which blood is oozing, and this sign will be obscured by a tourniquet.

Operative Technique

The aim of the operation should be to remove all pus and slough from the abscess cavity in the fingers or hand. This means that the incision must be large enough to allow adequate inspection of the cavity. On the other hand, unnecessarily large incisions should be avoided—for example, the old shark-mouth incision. All dead skin should be removed, particularly dead superficial layers of epithelium. A superficial purulent blister may be the superficial pocket of a bilocular abscess or "epithelial" collar-stud abscess (Fig. 1). When the superficial

FIG. 1.—Epithelial collar-stud abscess, showing the deep loculus, below the basal layer of the epithelium, bursting through into the superficial layers.

dead layer of such a purulent blister has all been cut away, the track leading to the deep loculus can be seen. A further incision through the deeper healthy epithelium will now allow this deeper cavity to be explored and evacuated.

(This article will conclude next week with a discussion of the management of special sites of infection.)

ANY QUESTIONS?

We publish below a selection of questions and answers of general interest.

Disinfecting Library Books

Q.—What should be done about disinfecting library books which have been used by patients suffering from an infectious disease?

A.—As the law now stands the medical officer of health is responsible for disinfecting library books which have been in contact with patients suffering from notifiable diseases. Unfortunately the few methods of achieving effective disinfection within a reasonable time and without causing damage to the books are expensive and difficult to control. Simple formalin cabinets are notoriously unreliable, ethylene oxide or low-temperature steam (with or without formalin injection) require complicated apparatus and skilled supervision, dry heat is apt to cause damage, and irradiation is available only in a few centres. If a book is allowed to stand open in a warm atmosphere most vegetative bacteria and viruses will die naturally in time, though this process may take several weeks.

However, in my opinion the risk of infection from library books is so slight that in most circumstances it may safely be ignored. Nevertheless, it might be wise to arrange for books from a house in which a case of

smallpox has occurred and for books used by patients known to suffer from open tuberculosis to be destroyed. It is assumed that a book which is visibly contaminated with human excreta or other bodily discharges would be removed from circulation for aesthetic reasons.

Stapedectomy for Otosclerosis

Q.—A married woman aged 30 underwent unilateral stapedectomy for otosclerosis last year with considerable improvement. Is the improvement likely to persist, and will it be affected by pregnancy?

A.—Since the first stapedectomy operations were performed only in 1958 the maximum follow-up is but seven years, and it is impossible to predict whether the good results persisting for this period of time will continue for the patient's full expectation of life. At present, however, there is no reason for believing that the improvement will not be maintained.

To date there is no reliable evidence to justify the supposition that the hearing in

otosclerotic patients worsens during pregnancy, though many otologists believe that this is so. In the case of a patient who has had a stapedectomy, pregnancy should make no difference to the hearing in this ear, though the general change in metabolism might conceivably affect the hearing in the unoperated ear in those patients suffering from bilateral otosclerosis.

Chlorpromazine for Infants

Q.—Is chlorpromazine an unsuitable drug to give for any length of time to babies 2 or 3 months old?

A.—Chlorpromazine is an accepted drug of recognized value in the treatment of agitated or anxious adults, especially of those suffering from psychoneuroses or psychoses. It is also of value in the shorter term in the treatment of intractable vomiting and in tetanus.

A major advantage of chlorpromazine in the adult is the fact that sedation is effected without clouding of consciousness or impairment of judgment. A major disadvantage of its long-term use is that it is apt to give rise to a wide range of toxic effects, including agranulocytosis, hypoplastic anaemia and leucopenia, and a Parkinson-like syndrome. It is possible that an infant of a few months is no more at risk from these toxic manifestations than an adult, provided that the