WAR WOUNDS AND AIR RAID CASUALTIES

The following is one of a series of lectures on the Treatment of War Wounds and Air Raid Casualties recently delivered at the British Postgraduate Medical School

GUNSHOT WOUNDS OF THE UPPER EXTREMITIES

BY

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In the treatment of gunshot fractures of the upper extremity several points require special attention. (1) As regards the wound itself, excision of the track may be extremely difficult in the forearm owing to the close apposition of tendons to the bone and the limited space available. This can be overcome to a certain extent by free skin incisions. (2) Bone fragments can be more freely removed in fractures of the shaft of the humerus than in those of the lower extremity, as shortening in the upper limb is of no great importance. Apposition of the two ends of bone is, of course, essential after removal of fragments. In the case of the radius and ulna it seems that removal of small bone fragments, which in all probability will necrose, is preferable to their conservation, as any gap can be filled in later by grafting. (3) Nerve lesions are more common in the upper than in the lower limb, and are of greater importance. Their early recognition is essential. (4) The most conservative attitude must be adopted as regards amputation, since the replacement of the upper limb by any apparatus is but a poor substitute for the natural limb, however deformed.

Fractures may be divided into four groups: of the shoulder girdle; of the upper arm; of the forearm; of the wrist and hand.

Fractures of the Shoulder Girdle

Gunshot wounds of the clavicle rarely come under treatment, as the injury is likely to be fatal, either from involvement of the subclavian vessels or of the lung. If no such complication obtains, after excision of the wound and removal of any sharp spicules of bone the case should be treated on the ordinary lines—that is, by Sayre's method or by a Hey Groves splint. There is remarkably little disability after removal of large portions of the clavicle. Fractures of the scapula not associated with a chest wound or with an injury of the upper end of the humerus and shoulder-joint are so uncommon that no special mention need be made of them.

Fractures of the Humerus where the Shoulder-Joint is Involved

Here one point is of special importance: in a considerable proportion of these cases the projectile may have entered the chest cavity, and this should be suspected where only a wound of entry is present. For first-aid treatment nothing more is needed than a bandage fastening the arm to the side and a sling. At the casualty clearing station, after excision of the wound and treatment of the joint cavity, bone fragments are removed as conservatively as possible, since a flail joint is of much less value than a joint ankylosed in a good position. Provided the situation of the wound allows it, a Thomas splint with an extension is the most useful for transport purposes. Where the wound is too extensive to admit of the use of the Thomas splint the patient can usually be transported in comfort with the arm bandaged to the side.

At the base, fixation of the arm in an abducted position with extension is essential: the extension may be taken by means of strapping applied just above the elbow or by means of a pin or wire through the olecranon, the forearm being flexed at the elbow and slung from a Balkan beam: by this latter means movement of the wrist-joint and elbow-joint is possible. As ankylosis is almost inevitable in cases of severe comminution the optimum position should be aimed at from the first—that is, abduction to 60 degrees with a few degrees of external rotation and with the elbow slightly in front of the coronal plane.

Fractures of the Shaft of the Humerus

Usually these wounds are associated with considerable comminution of bone and in many instances injury to the musculo-spiral nerve or brachial artery. In the front area, after applying a dressing, the limb may be bandaged to the side, the forearm being supported by a sling or bandage: this method is applicable to most cases, except those fractures just above the elbow-joint, for which a simple splint such as an internal angular is desirable.

At the casualty clearing station the wound is excised in the routine way, careful examination for nerve injuries having first been made. For transport to the base a straight Thomas splint is usually satisfactory, but it must be remembered that this method does not as a rule give satisfactory alignment in fractures of the lower third when the forearm is extended, and it should only be regarded as a temporary measure. At the base the straight Thomas splint may be retained to support the upper arm, extension being obtained by pin or wire traction through the olecranon and the limb being slung from a Balkan beam in an abducted position with the forearm flexed. This method allows of free access to the wound and good alignment of the fragments, and, further, finger, wrist, and elbow movements may be started at an early date. As soon as the condition of the wound allows the limb may be put on a bent Thomas arm splint, which allows the patient to be up, or a plaster-of-Paris splint may be employed.

Fractures involving the Elbow-joint.—These are commonly of a severe nature, with much bone injury and often with associated nerve-trunk injuries. In the forward area an internal angular or Jones interrupted arm splint should be applied for transport. At the casualty clearing station the wound is treated in the ordinary way; small detached fragments of bone are removed, but great care should be taken to preserve as much bone as possible, and especially the olecranon process. The joint cavity is then irrigated and closed by suture of the capsule or by the use of fascial flaps. For transport to the base a straight Thomas splint with an extension, the hand being in full supination, is the most suitable method.

At the base the straight splint should be used for a limited period only—not more than fourteen days—owing to the difficulty in obtaining flexion subsequently if the arm is kept extended for too long: a Jones interrupted arm splint may be used or the limb may be supported, without splinting, on pillows, the forearm being flexed to a right-angle at the elbow. Ankylosis or greatly restricted movement is almost inevitable; the limb there-

fore must be put in the most useful position at as early a date as possible. In most cases flexion to 75 degrees with the hand midway between pronation and supination is the optimum position. Formal excision of the joint is rarely called for, but may be necessary in severe infections to save the limb.

Fractures of the Forearm

One or both bones may be involved, muscles and tendons are often severely damaged, and nerve injury is not uncommon. The preservation of a useful limb therefore presents very considerable difficulty. For transport to the casualty clearing station immobilization on a straight splint, supporting the hand as well as the forearm, is sufficient. At the casualty clearing station, after the routine treatment of the wound, bone fragments, especially those driven into muscle, should be removed. It is better to leave a large gap between the bone ends and a wound that heals readily than to leave small fragments of bone, which inevitably necrose and delay healing for months. The gap can subsequently be filled by bone grafting, which was carried out successfully in many of these cases. Repair of divided nerves and tendons should be effected if possible, though this is not often the case.

For transport to the base a straight Thomas splint with a strapping extension, the forearm being in full supination, is the best method. At the base the straight Thomas splint may be used for the first fourteen days, after which time a bent Thomas splint may be applied. Plaster-of-Paris, though of value later, is not very suitable in the early stages owing to the difficulty in controlling the fractured bones without extension.

Fractures of the Wrist and Hand

Wounds of the carpus are often explosive in type, with a large exit wound and with great damage to tendons: the wrist-joint is commonly involved. In the forward area, after dressing, a simple flat splint is applied. At the casualty clearing station, when the wound has been excised, the carpal bones are carefully examined, and any that are badly comminuted are removed. Closure of the capsule of the wrist-joint is usually impossible, and the wound cavity is best packed with gauze smeared with petroleum jelly. Primary amputation should only be carried out where tendons, vessels, and nerves have been completely destroyed.

Splinting of wrist-joint injuries with extensive wounds is difficult, but for transport to the base a simple flat splint extending from the roots of the fingers to the elbow-joint is generally adequate. At the base, provided healing is proceeding satisfactorily, the hand and wrist should be put on a Jones cock-up splint or in plaster, the wrist being dorsiflexed. On the whole this type of wound gives poor results, but even if partial use of one finger and the thumb can be obtained this is better than any artificial limb.

THE ENTRANCE INTO MEDICINE*

BY

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The medical curriculum to-day is very different from what it was forty-five years ago when I became a medical student. At that time *x* rays and radium had not been discovered, abdominal operations were few, and the surgery of the brain and thorax was rudimentary; nothing was known of vaccines, vitamins, or hormones, little of blood diseases, and the work in the clinical laboratories was confined to what we now regard as the simplest examinations. There were no ante-natal departments or special departments for diseases of children or infant welfare, for orthopaedic, for genito-urinary, or for chest surgery, to mention only some of those there are to-day.

Fundamental Principles

But although so much more is now known about every branch of medicine and surgery and there is so much more to learn, the fundamental principles of medical education are the same. Now as then there are things that must be known, some that ought to be known, and others with which the student should have some acquaintance if only to satisfy examiners. But that is not all, for in addition to acquiring a certain amount of medical knowledge the student is taught to cultivate accuracy, observation, and deduction, and to reason carefully, so that he or she may be able to bring a trained intelligence to bear upon medical problems.

Medical education should mean much more than the acquisition of so many facts and theories; it should train the mind in such a way that it may be ready to take the initiative, to adjust itself quickly to new situations, to apply to each case in a free and understanding way the principles, the routine, the discipline which have become second nature. The years spent as a medical student are only an introduction to a study which must continue throughout professional life.

The Pre-clinical Years

The curriculum is long and you may feel impatient at the time that must elapse before you reach the wards and come into contact with sick people. You may feel that the time given to chemistry, physics, and biology is wasted, and that a great part of what you are taught in anatomy and physiology is quite unnecessary; yet these subjects have a very important bearing on clinical work. A preliminary knowledge of them is essential if you are to understand the various methods of examining your patients, many tests that are carried out, and certain forms of treatment.

Let us consider for a moment some of the things we owe to physics. First of all the *x* rays, which have proved of such immense value in the diagnosis of disease in every part of the body, and radium, which like the *x* rays has done so much for inoperable cases of malignant disease. Physicists discovered the ultra-violet and infra-red rays, and, while both have their value in treatment, the former play an important part in the demonstration of ultra-microscopic viruses. I need hardly refer perhaps to the importance of a knowledge of electricity, but as one instance I may mention the recent discovery that waves of electricity pass over the brain, and that alterations in these waves tell us of the presence of disease or a tumour. At present it is possible to localize only those lesions that are on the surface, but there can be no doubt that before long the method of electro-encephalography will enable us to determine the exact site of a tumour lying deeply in the

* An address (abridged) given at the London (Royal Free Hospital) School of Medicine for Women, University of London, on June 1, 1939.

At a joint meeting of the Yorkshire Regional Committee and the Sheffield Regional Committee of the British Hospitals Association, held in the General Infirmary at Leeds, approval was given to the creation of two divisions to cover Yorkshire (excluding the Cleveland area) and parts of Derbyshire, Lincolnshire, and Nottinghamshire: one division to be centred on Leeds and the other on Sheffield. Power will be given to the divisional authorities to split these two divisions into regions and subregions. The object is to co-ordinate hospital services and avoid duplication and overlapping.