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

THE PRINCIPLES OF TREATMENT IN GUNSHOT WOUNDS OF JOINTS

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If you consider the various joints in the body it will be clear that a joint comprising a single simple sac is uncommon. Most joints are complex, and are divided more or less completely into compartments. This arrangement tends to limit infection from injury for a time and also makes efficient sterilization of the joint cavity by irrigation more difficult. The synovial membrane is much more resistant to infection than is usually thought: this resistance is due in part to the synovial exudate, which appears to be bactericidal, and partly to the nature of the epithelium lining the joint. Injury to the epithelium by the use of strong antiseptics, ether, etc., is therefore to be avoided in the treatment of injuries. A secondary result of the changes in the character of the synovial exudate in infections is an alteration in the cartilage covering the bone ends forming the joint: this cartilage is partly nourished by the synovial fluid, and if this fluid is grossly affected the cartilage swells, softens, and tends to flake away or become easily eroded if submitted to pressure.

First Measures

The recognition of these points is of great importance in both treatment and prognosis of joint wounds. In the forward area a simple dressing should be applied and the joint should be immobilized by bandaging to the trunk or by splinting; nothing further should be attempted until the patient reaches the casualty clearing station. Here all cases should be regarded as urgent, and operation should be carried out as soon as possible. An x-ray examination should be made to identify the presence of a retained missile and to estimate the degree of bone injury. Accurate localization of metallic fragments by stereoscopic or other means is of great value.

The skin is sterilized over a wide area and the wound is excised down to the opening in the synovial membrane. In most cases, if there is a retained foreign body, a wider opening of the joint is necessary or a separate incision may have to be made. If this is the case a fresh set of towels and instruments, etc., should be used. After removal of the missile the joint is freely irrigated with saline or 1 in 2,000 flavine solution to remove fragments of clothing, etc., which may have been driven in, and to cleanse the joint cavity so far as is possible. The joint cavity is then closed by suture of the synovial membrane and capsule of the joint in one layer with interrupted catgut stitches. This may present difficulties in extensive wounds, but it is usually possible to mobilize the synovial membrane to some extent and so allow of suture of the opening, or fascial flaps may be employed to cover defects.

The late Captain John Campbell suggested the use of the olecranon bursa to fill in a gap in the synovial membrane of the knee-joint, and, acting on his suggestion and with his help, I applied this method in three cases. If it is impossible to close the synovial cavity, as may

occur especially in the tarsal joints, the opening should be firmly packed with sterile gauze smeared with petroleum jelly: this acts as an effective seal and promotes local adhesions which close the joint. Where the joint has been effectively closed the soft parts may either be sutured if the case has been treated early, or left for secondary suture if doubts are felt about the efficient sterilization of the surface wound: in this case a light pack of flavine gauze (1 in 2,000) is the best form of dressing. After the application of dressings the joint is immobilized with extension on a suitable splint: *immobilization with extension is of the greatest importance, and must never be omitted.* Cases should be retained in the casualty clearing station for five to seven days if circumstances allow.

Treatment at the Base

At the base it will inevitably be found that in times of stress a number of patients will arrive with joint wounds which have not been operated on in the forward area. Some of these can be operated on in the way already indicated; others in which frank infection is evident must be treated by methods which will be described later.

On arrival of a case that has been operated on the splint and extension must be adjusted or reapplied and the condition of the patient must be carefully reviewed. Adverse symptoms are pain unrelieved by readjustment of the splint, pyrexia, raised pulse rate, insomnia, and loss of appetite. Adverse local signs are a dry and sloughy condition of the external wound, marked effusion into the joint, oedema of the limb below the joint, and extreme pain on the slightest movement. If these symptoms and signs are absent or abate with rest and adequate extension, movements may be allowed after the wound has been soundly healed for a week, provided there is no gross bony injury. Movements should be active and not passive, and must be very gentle at first. Any reaction following movement is an indication that further rest is essential. Major Everidge's apparatus in the case of the knee-joint is of great value in assisting early immobilization of this joint. In an uncomplicated wound of the joint with no gross bony injury and healing kindly, full restoration of function should be obtained in from six to nine weeks.

If pain, pyrexia, and effusion persist or arise after operation, aspiration of the joint must be performed at the most convenient spot. Gas-and-oxygen is preferable to local anaesthesia owing to the risk of infecting the area infiltrated with novocain. As much fluid as possible is withdrawn and retained for bacteriological examination. The naked-eye appearance of the exudate varies with the degree of infection: (a) mild infections show a yellow fluid with flakes of lymph; (b) in more severe infections the fluid is turbid; (c) in advanced cases the fluid may be obviously purulent. A stained film of the exudate is of value if an immediate diagnosis is needed before cultures can be made. Preponderance of mononuclear cells with few organisms which stain poorly suggests a mild or recovering infection. Excess of polymorphonuclear cells and large numbers of organisms are of grave significance. Bacteriological examination may reveal any

type of organism: gas-forming organisms, staphylococci, streptococci (non-haemolytic or haemolytic), etc.; the most dangerous organism is the haemolytic streptococcus.

If improvement follows aspiration it may be repeated at intervals of twenty-four to forty-eight hours: if no improvement results after forty-eight hours, or earlier in the case of the haemolytic streptococcus infections, more active treatment is necessary. The joint must be opened freely and be gently irrigated with 1 in 2,000 flavine solution: the wounds are subsequently left open, the joint being covered by a voluminous dressing and adequately splinted. The introduction of drainage tubes into the joint is to be avoided, as they do more harm than good, and I am not in any way convinced that the Carrel-Dakin method of treatment is of any value in these cases. Provided the general symptoms abate nothing further need be done: ankylosis is almost inevitable, and the limb must be kept in the optimum position for this.

If pain and fever persist amputation is indicated, and must be carried out before the patient has gone too far downhill. A special indication for amputation is spread of the sepsis outside the joint cavity into the surrounding muscles. Excision as a means of eradicating sepsis in an infected joint is unsatisfactory in the larger joints owing to the shock of the operation: in the smaller joints, such as the elbow, the free removal of bone fragments may assist drainage and conserve the limb, but no formal excision should be attempted.

The following table gives the results in a small series of cases in which treatment by primary excision and suture of the wound was used.

Wounds of Joints without Gross Bony Injury

	Cases	Healed	Failed
Knee-joint	16	14	2
Shoulder	4	4	0
Elbow	18	16	2
Ankle	7	5	2
Totals	45	39	6

MEDICAL ASPECTS OF CRIME

MAGISTRATES' ASSOCIATION IN CONFERENCE WITH B.M.A.

A conference summoned by the Magistrates' Association, with the co-operation of the British Medical Association, was held at the B.M.A. House in London on June 23. The object of the conference was to consider how medical and psychological knowledge could be made available to magistrates in their duties, both in court and elsewhere. The first of the two sessions was presided over by Lord Alness and was devoted to juvenile crime; the second, presided over by Mr. G. A. Bryson, to adult crime.

Juvenile Delinquency

LORD ALNESS contented himself with making what he described as two elementary suggestions from his long judicial experience. The medical man when submitting evidence to a court should use simple, non-technical language. Nothing irritated a court more than a report or other evidence abounding in polysyllabic and unintelligible words and phrases. He also urged that such evidence should be as balanced and judicial in character as possible.

MISS MADELEINE SYMONS, J.P., president of a London juvenile court, said that in the juvenile courts of the metropolis in 1938 the number of serious cases found

proved was 3,196; in 526 of these, special reports were obtained by the courts from the medical psychiatrist at the remand home, and a considerable number of others were obtained from various sources with regard to persons on bail (the Institute for the Scientific Treatment of Delinquency alone furnished thirty-nine such reports). No doubt all magistrates and others concerned had felt the lack of adequate medical facilities—facilities which would in time be stimulated throughout the country as a result of the financial provisions of the Criminal Justice Bill. Such medical services as the courts needed could not, with the best will in the world, be obtained in a short time. In the absence of such facilities the magistrates must rely on getting reports from well-trained probation officers, with plenty of time to do their work properly, and the magistrates must also educate themselves, with such help as the medical profession could give them, so as to become more skilful in deciding the appropriate treatment.

DR. WILLIAM MOODIE, medical director of the London Child Guidance Clinic, addressed the conference on some indications for special medical examination. He said that very often the psychiatrist, having had practice through seeing numbers of cases, could recognize a mental defective who might not be recognizable to the ordinary eye under the stress of conditions in court. He agreed as to the frequent inadequacy of the reports from medical people given to the courts; the reason was that the doctor was often required to make a report without having all the relevant information, so that it had to be more or less intuitive, the deductions being built on quite slight observations.

DR. J. D. W. PEARCE, medical psychologist, L.C.C. remand home, discussed observation and diagnosis. It was necessary for the examining doctor, he said, to be in touch with general medicine, and at the same time to know psychology and to have had psychiatric experience. Physical examination was an important, if humdrum, part of the work. As to the psychiatric examination, a very important matter was its flexibility. He also stressed the need for being definite in the report; it was of no use saying that such and such a thing was probable. In view of the fact that the majority of the offenders who needed examination were boys, he thought a man doctor should be employed for the purpose.

DR. DENIS CARROLL of the Institute for the Scientific Treatment of Delinquency spoke on treatment, by which, he said, he meant any method of handling offenders with a view to their reform. Nearly all the delinquents who came for observation revealed a multiplicity of causes which led up to the delinquency. From a medical point of view it was important to see that any important cause, or any cause which if it persisted was likely to lead to recurrence of the delinquent action, should be dealt with. Causes were superficial or deep. Superficial causes were in the immediate circumstances which led up to the delinquency, and could be dealt with by probation officers; deep causes were pathological mental traits or disorders and needed medical advice every time. Dr. Carroll considered that the remand in custody of a juvenile offender was unnecessary as a matter of routine. A large number of such offenders could be better dealt with in out-patient clinics, especially if there was attached a small in-patient observation department. Treatment could be obtained in any psychiatric out-patient department of a general hospital which had a children's branch—where there was not a children's branch such a department was not suitable for the purpose—and at any child guidance clinic.

Men or Women Doctors?

In some subsequent discussion Dr. Pearce's point about the desirability of a man doctor was taken up. He explained that not only were male offenders in the majority, but the female offenders were very largely girls of 16 or 17 who were brought up for some sex offence, and these were more responsive, he thought, to a man than to a