CHAPTER 39

WOUNDS OF JOINTS

These injuries called for great skill and initiative, as the official technical instruction (No. 22, Middle East) pointed out. The surgical principle of keeping the joint immobilised in its natural position of rest was not simple to carry out. In order to immobilise the knee joint, the whole lower extremity had to be controlled, and the special instructions laid down that either a plaster spica was used, or a plaster casing from the groin and gluteal fold downwards over a Thomas knee splint slung from a frame. Sepsis of the joint introduced a grave problem, for immobilisation, so necessary in this very painful condition, was more difficult to maintain. Suppurative arthritis with its accompaniments of fever, toxaemia, anaemia and local abscesses or generalised blood infection was still found to be a formidable illness. Experience discounted some of the earlier optimism which expected the natural powers of resistance, aided by immobility in plaster to overcome this type of infection. The decision whether amputation was necessary or not was just as important and difficult in some of these infections as it was during the 1914-1918 war. Experience with bullet wounds was more favourable than with those produced by more destructive missiles; rest and the minimum of interference produced good results. Excision was reduced also to the minimum; as a rule only the wound of exit needed attention, chiefly if the bullet, after striking bone, had been deflected. Aspiration of the synovial space was sometimes necessary. Usually active movement could be begun in two or three weeks, provided the bones were not seriously damaged. The larger wounds, from shells, particularly those with lodged foreign bodies, were much more serious. In forward areas the lack of X-ray facilities made this work difficult. It was somewhat a question of transport, and in the later years when the conditions of the terrain or the provision of air transport permitted it, a delay of two or three days before primary excision of the wound was undertaken permitted fuller investigation to be made under good conditions. The developments of chemotherapy made this a much safer procedure. By giving the patient a better chance of functional recovery penicillin encouraged adequate exploration, search for and removal of foreign bodies, and excision of devitalised tissue.

The need to save life was a real one in wounds involving large joints, and resuscitation was needed by all patients with such severe injuries whether their appearance at first suggested it or not. Actual loss of blood as in all severe limb wounds was often considerable, and serum or plasma alone was not always enough.

Major T. F. Rose and Major A. L. Newson have reported a representative series of 66 gunshot wounds of the limb joints seen in the later Pacific campaigns. They recognised three types of wounds, one in which the capsule and synovial membrane were perforated or torn, one in which
the bone and the articular surfaces had been injured, and one in which complete disorganisation of the joint had taken place. In the latter types injury to nerves and blood vessels was sometimes an additional major complication. No less than 40 of the severest variety of injury were included in the series; in these nothing better than ankylosis could be expected as an end result. As a routine sulphamerazine was given by mouth when first aid measures were applied, and as soon as possible penicillin, 15,000 units every three hours, was administered, as well as gas-gangrene antitoxin and tetanus toxoid. Radiological examination was made when possible. High-velocity missiles produced less damage than those of lower velocity and the resultant wounds often did well with merely aspiration of the joint and instillation of 20 c.c.m. of penicillin solution, 5,000 units per millilitre. Where soft tissue damage had occurred excision was carried out and in the search for foreign material another incision was sometimes necessary. When severe damage had occurred all loose fragments were removed, including articular cartilage, if it was obvious that ankylosis would occur. The patella was saved if possible in injuries of the knee joints, as it was felt that minor damage did not justify the removal of this bone as some advise. Capsular suture was done in large joints where the conditions permitted, and penicillin was introduced before the last stitch was tied. Where damage was so severe that no repair could be made the wound down to the joint space was lightly filled with gauze soaked in 1 to 1,000 “Monacrin”: this could be left for two or three days undisturbed. If X-ray examination was not at first available it was carried out as soon as possible, and if intra-articular foreign bodies had previously not been located they were removed by the most suitable route and penicillin was again instilled. Where early suture was not possible the matter was reviewed after four or five days. Some wounded men reached the surgeon only after the lapse of several days, when infection was already established. Such infections were treated according to the indications, drainage being ensured by wide incisions if necessary. A problem sometimes arose when evidences of infection of a joint cavity occurred after closure. If no foreign body was present and if the effusion was not purulent, aspiration and redosage with penicillin locally might suffice. More radical measures were sometimes inevitable, but where severe spreading sepsis occurred no attempt was made to perform resection. Amputation of limbs was performed at the primary operation in 18 of this series; it was necessary later four times for spreading infection. Special mention must be made of the tarsal and tarso-metatarsal wounds, which are apt to be troublesome. In two cases of this series amputation was required; in the remainder the tarsus survived infection, but no details as to ultimate functions were available at the time. "Monacrin" was found useful as a local application as in the wounds not involving joints. The dosage of penicillin was that found effective in other deep tissue wounds. In spite of the capacity of the antibiotic to enter serous cavities from the general circulation its local introduction into the synovial cavity as above described was thought desirable. Tube instillation was not used.
Immobilisation was ensured by the usual methods: when infection of joints was present light traction on a strapping extension was applied to keep the joint surfaces apart.

The simplest evaluation of the results is in the authors’ words “now that penicillin has minimized the effects of pyogenic cocci and anaerobes, and local ‘Monacrin’ therapy that of the Gram-negative penicillin resisters, the ultimate result is in direct proportion to the structural damage”. This is borne out in the retention of good movements in injuries of the two lesser types, and the successful localisation of sepsis in most cases. It is interesting that one Japanese prisoner developed tetanus which was successfully treated. Careful attention was given to mobilisation of the joints: early movement was possible in lesser injuries, if pain was disappearing, but the decision in these matters must always be individual.

When patients were moved to bases on the mainland at a stage when movement was essential, difficulties were experienced in securing regular muscular exercises and mobility of joints during a long and often interrupted journey. Owing to unavoidable delays, patients sometimes arrived at the 1st Australian Orthopaedic Hospital at Toowoomba with stiff joints. The establishment and maintenance of an orthopaedic hospital belong to the administrative side of the history: here it may be stated, however, that some surgical opinion considered that under prevailing conditions of distance and transport, special departments attached to general hospitals were more generally useful.

In other areas similar results were obtained, and experience laid emphasis on the necessity for thorough exploration of these wounds for foreign material, without which reliance on penicillin was destined to failure.

REFERENCES

D.G.M.S., Army, Tech. Instr., No. 20.