SPORTS INJURIES

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This paper is concerned mainly with the basic principles of the cause, type and management of injuries of the locomotor system commonly sustained in athletic pursuits.

Before considering the physical conditions it is helpful to consider some of the psychological aspects of athletic injury. Competitiveness is associated with a degree of anxiety and this is reflected in the clinical state. There may also be anxieties associated not only about success or failure but also over the adequacy of preparedness. The 'will to win' is a frequently noted attribute of the successful athlete which in such instances goes far to allay anxiety. Short of this there may be problems in achieving the correct balance between being properly 'keyed up' and being 'overtaut'. Anxiety may contribute to muscle spasm. Some over-reaction in symptoms is therefore normal.

The visible presence of first aid or similar help can help to provide a sense of preparedness and even tetanus immunisation can play a part in this way to dispel some doubts. Physically trivial injuries merit attention in proportion to the high level of physical activity concerned even although reassurance may be the most important part of treatment. Reassurance is, however, more often achieved by deed than by word; a limb supported in a comfortable position, an examination carefully conducted and an innocuous measure applied have all psychological value. To say that some pain is 'just muscular' is small comfort when the muscular pain of cramp, colic and even angina are remembered. Finally, in handling of mental reaction to injury it is worth analysing the common request to 'tell me the worst'. This remark is made at a time when the stress reaction may well make the truth more palatable than it will be at some later date when hopes have again begun to rise. Again such opinions do have to be based on experience and careful examination.

The physiological reactions to injury are virtually common knowledge but bear repetition for their relationships to the management of injury. It is not within the scope of the current occasion to do more than mention the general reactions to injury which are mainly hormonal and in particular related to the adrenal cortical and medullary hormones.

The local reactions to injury are again partly hormonal and partly chemical in response to the liberation of breakdown products and escape of blood. Bleeding and effusion of serum produce swelling which

will eventually provide the first, if cumbersome, natural splint. Swelling in turn causes stretching of adjacent undamaged tissue and produces pain. The reflex response to this produces inhibition of some muscles and spasm of others and affords a second natural splint mechanism. Spasm may however cause displacement of a fracture and cannot be long sustained without cramp or fatigue symptoms and this is the basis for the use of traction as a method of immobilisation. A firm, supported, pull is usually the most comfortable way to splint or move an injured part. In sequence the effused serum and blood become clotted and afford further splintage. Following this, fibrin in the clot undergoes retraction and the clot becomes firmer, more gelatinous and adhesive and further immobilisation is provided. It has been wisely said that 'oedema (effused serum) is glue' and this refers not simply to the manufacture of gelatin glue. The more abundant the fibrin produced by injury or injudicious activities the more rapidly will torn tissues be involved in repair but also the greater will be the amount of adventitious reparative tissue which will later require absorption in resolution. Before this however the blood clot is invaded by ingrowth of local capillary blood vessels and fibrous tissue cells leading to the formation of fibrous or scar tissue. This is a further natural splint but only a minimum is useful since it lacks all tissue differentiation, even elasticity and sensory faculties. As the scar tissue matures over the course of weeks or months it undergoes either contraction or in certain circumstances as in bone, ossification. Finally the return to normal of the local circulatory state brings absorption of effusions, breakdown products and superfluous reparative tissue, resolution. This stage is promoted by muscular activity. The local stimuli to restore movement are necessarily less clamant than the initial reaction to achieve immobility. Nonetheless, regression of pain, feeling of well-being and even itching are indications to proceed.

The management of injury can be defined as the use of such procedures as will foster the above natural reactions. There is thus a basic dilemma between the needs for REST and for MOVEMENT. Any art in their application lies in the judgement as to when to initiate the succession of the one by the other. Historically concept of this process was ill-founded on the idea that since injuries caused stiffness motion should be instituted from the beginning in some degree. Reference is made to the contributions last century of John Hilton, Hugh Owen Thomas and, in this century, Sir Robert Jones. Their doctrines which were regarded as heretical have been vindicated by the now accepted proof that

immobilisation alone could prevent rather than cause restriction of movement following disease or injury of the locomotor system.

Basically the first step in management is the elevation above heart level of the injured part to reduce bleeding. Pressure bandaging, splintage and occasionally surgical measures may also be required. Similar control of effusion is obtained by elevation, pressure bandaging and institution of static contraction exercises to invoke the venous muscle pump in absorbing tissue fluid. Abnormal mobility may require support, splintage or even surgical repair. Rehabilitation begins by restoring related joints to their postures of function as demonstrated. Muscular re-education begins with isometric and proceeds to isotonic and then to endurance exercises.

Diagrammatic representation of the basic motor unit is useful in indicating the usual anatomical classification of injuries at the common sites of breakdown of muscle, tendon, bone and joint.

In the particular classification of sports injuries the adoption of an aetiological classification can be helpful

and a consideration of the pathology of some of the commoner sports injuries is based on Dr. Williams' classification.

FIG. 1.

THE MOTOR UNIT, comprising the large alpha motor fibre supplying many muscle fibres, and the feed-back mechanism of the Golgi organ and the fine gamma loop system. The control of the motor cell is from the cerebrum, the cerebellum, through stretch reflex pathways, and through the gamma loop system.

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