THE PHYSIO-THERAPEUTIC ARAMENTARIUM IN THE TREATMENT OF SPORTS INJURIES

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Rather than discuss theoretical advantages of various forms of physiotherapy I felt that it would be more interesting and more useful to see how these methods of treatment could be applied to injuries which commonly occur in sport. Perhaps the most important fact to realise is that the vast majority of sporting injuries are medically trivial. In most cases a few weeks rest or even giving up the offending sport for a short period will produce a cure but particularly in times when competition is fierce it is just this period of rest which is not available and we must keep sportsmen playing if possible, or, at any rate reduce the period of absence from sport to a minimum. In sports medicine a great deal of the treatment is highly individualistic and as yet there is no well-documented body of carefully constructed trials to test the efficacy of one form of treatment against another.

Bass has shown that in contact sports muscle damage either by direct or indirect trauma is the commonest form of injury. A very common and troublesome injury in all contact sports is a haematoma of the quadriceps muscle and its treatment illustrates a number of principles which can be applied to other injuries. Bass has suggested that these can be divided into intra-muscular tears and inter-muscular tears. In the first, bleeding is deep within the muscle and there is little or no extravasation outside the sheath. The swelling persists with muscle weakness until healing by scar tissue is complete. In the inter-muscular tear the tear is placed more superficially in the muscle and surface bruising at a point distant from the injury occurs with a much more rapid resolution of symptoms.

Treatment of these lesions can be divided into early and late stages. In the early treatment of a large quadriceps haematoma rest is essential until active bleeding has settled and bed rest with the leg elevated on pillows for 24 hours helps to reduce the size of the initial lesion. Aspiration with a wide bore needle would appear to be the treatment of choice but results are often disappointing even when the muscle seems to be stretched to bursting with blood. This may be because although a large quantity of blood is present it is diffusely spread among the muscle fibres as it would be in a sponge. Again although injections of hyaluronidase were once used in the hope that they would help resolution there seems little evidence that in this initial stage the early application of a tight bandage of cotton wool and spiral turns of crepe bandage may reduce the size of the haematoma (Armour & Colson) - while ice packs at this stage are sometimes advocated.

Physiotherapy can usually begin about 24 hours after injury but this period will obviously vary with the severity of the injury. It is at this stage that opinions with regard to treatment vary most widely. Short-wave diathermy is often used and good results are claimed. On theoretical grounds, however, this is debatable as the virtue of short-wave diathermy is that it provides a fairly uniform heating effect throughout the field and therefore presumably a similar hyperaemic effect. At this stage, therefore, which is long before healing has occurred it will only tend to increase swelling. Massage, unless very gentle, will tend to increase damage and swelling and does seem to be associated in a number of cases with calcification in the haematoma.

The method which I have found most effective is the regular performance of static quadriceps exercises in the department with the patient continuing these for five minutes in the hour, on the hour at home. A useful additional aid to resolution is the prevention of all bending of the knee when up and about as this causes traction on the quadriceps and before resolution has occurred tends to increase inflammation. A plaster back slab will usually achieve this although getting present day trousers on over the slab often present minor difficulties. Flexion of the knee should not be recommenced until there is no pain or tenderness in the area. This, however, usually occurs very quickly. A useful check on the resolution of the haematoma is provided by a regular recording of the diameter of the thigh at the point of injury. Once pain and tenderness have resolved it is essential that the normal length of the muscle should be recovered before full activities are resumed, otherwise further tears are likely to occur. A programme of graduated stretching exercises should be carried out until on careful testing there is no shortening of the muscle compared with the normal side. At this time short-wave diathermy can be useful in helping to soften scar tissue.

In cases where marked quadriceps inhibition has occurred faradic stimulation for three or four days helps to restore a normal pattern of movement to the muscle.

Thirty per cent of all sports injuries occur in the region of the knee and accurate diagnosis is vital. Although manipulation is sometimes tried, surgery is the only effective treatment for a cartilage locked across the joint and we all know of sportsmen in whom an ill-considered injection of Hydrocortisone and local anaesthetic and a return to the game has converted a partial tear of the medial ligament of the knee into a complete one with lasting incapacity. There are, however, minor conditions affecting the knee which can be improved a good deal by fairly simple means. Persistent pain in an otherwise normal knee can be caused on the lateral side of the popliteal fossa by an incomplete tear of the insertion of the biceps tendon expansion into the lateral condyle of the tibia. The treatment of this condition is the use of ultrasonic

therapy until the pain has localised to a small area using an intensity of 3 - 4 watts/sq.cm. for ten minutes. It has become fashionable in some quarters to use high intensities of ultrasonic energy for much longer period of time than those recommended by the manufacturers. Before doing this, however, it is as well to remember that reports have begun to appear especially from Canada of degenerative arthritis apparently caused or aggravated by ultrasonic therapy, while at 10 watts/sq.cm. ultrasonics can be used to sterilise water by destroying living organisms. One of the great advantages of ultrasonic treatment is that ultrasonic waves are small oscillations in the line of propagation and the waves are longitudinal instead of transverse as they are in electromagnetic waves. This makes accurate localisation at a small treatment area easier.

Many sporting injuries involve the Achilles tendon. Accurate diagnosis is very important in their proper treatment. If a rupture of the tendon has occurred there is an indentation over the tendon 1" above the heel and Campbell-Thomson's test may be useful. With the patient kneeling on a chair with his feet dangling over the side the calf is squeezed from side to side between finger and thumb at a level half-way between the knee and the ankle, on the uninjured side this results in plantar flexion of the foot. On the injured side no movement occurs. In complete ruptures of the tendon surgical repair should be instituted as soon as possible.

Where rupture is not complete a very painful peri-tendonitis may be caused by the tearing of a few fibres of the tendon giving a small thickening which is tender on pressure 1-2" above the insertion into the heel. There is also a great deal of crepitus on movement of the tendon. This condition can be cured by ultrasonic treatment until the area of tenderness has been reduced to a point source and this area injected with either Hydrocortisone or by one of the long-acting particulate synthetic steroid preparations such as Prednisolone Trimethyl Acetate. The patient is also helped by raising the heels of the shoes one half to one inch which helps to reduce the tension on the tendon.

Pain and sometimes swelling higher up in the calf usually localised over the medial belly of the gastrocnemius may be caused by a tear of the muscle. 24 hours rest initially will help this condition a great deal and should be followed by non weight-bearing static exercises until pain and tenderness has resolved followed by stretching exercises. Full activity, as in the quadriceps, should not be recommenced until putting the muscle on full stretch does not cause pain and there is no limitation of movement compared with the normal side otherwise another sudden strain is likely to cause further injury. If, despite apparent healing, full lengthening of the muscle is difficult to achieve short-wave diathermy can be useful before a course of stretching exercises.

In the treatment of ankle injuries I will not consider fractures or complete tears of the anterior talo-fibular ligament as these will be dealt with by other speakers but experience with professional footballers suggests that minor injuries of the ankle fall into two main categories. Those with a marked effusion and those without. This effusion is usually easier to see at the back of the ankle on either side of the Achilles tendon.

Where there is no effusion a period of rest with stirrup strapping with non-extensible sticky plaster for 24-48 hours followed by daily foot and ankle exercises will usually resolve the condition quickly even though there has been marked bruising. Massage is sometimes used but this is not so effective as a proper course of planned active exercises. Where there is a marked effusion even in the absence of severe bone or ligament damage immobilisation in plaster of paris until the effusion resolves is usually the quickest way of getting the patient back to active sport. This should always be followed by a course of active exercises for the ankle and foot and these are a very important part of treatment as if they are neglected foot strains may occur when the patients return to full, normal activity. Often if the patient has been non weight-bearing for some time faradic foot baths to promote maximal contraction of the intrinsic muscles of the feet are a useful adjunct to exercises.

Bruising of the metatarsal heads is very common among runners at this time of the year when they are making the change over from running on grass to running on tracks and roads. Faradic foot baths and exercises for the intrinsic muscles of the feet will help any weakness of the arches of the foot while a sponge rubber pad in training shoes will give a great deal of relief. This must be fairly thick up to 5/8" to give relief in many cases. With a more carefully graded programme of training this condition usually clears up in two to three weeks.

Although the drug treatment of injury may hardly come within a physio-therapeutic remit, I feel that some mention of it may be helpful. In the reduction of pain and swelling in the early stages of injury both Indomethacin and Butazolidine are useful although it must be remembered that these must be used cautiously if there is any history of indigestion or peptic ulceration. Indomethacin can be used in capsules of 25mgms. three times a day with a 100mgms. suppository at night if an increased dose is required. Butazolidine is usually employed in divided doses of 300 - 400mgms. per day but Williams has had good results with much larger doses up to 700mgms. per day.

Various other compounds have also been used to reduce swelling and bruising. Chymoral contains 50,000 Units of proteolytic enzyme concentrate. A mixture of Trypsin and Chymotrypsin. The dose is two tablets four times a day. Varidase is another of these compounds and is a mixture of Streptokinase and Streptodornase. Blonstein feels that these compounds do reduce swelling and bruising and his results with the new compound Ananase have aroused interest. For the quick reduction of swelling and inflammation steroids may be

used. In a dose of 20mgms. daily Prednisolone for 3-4 days is very effective. A dose of this duration will not light up tubercle since this effect takes at least two weeks and the duration is much too short for such effects as osteoporosis and delayed wound healing. The only side effect which might be dangerous would be peptic ulceration which is a local effect and might be dangerous and would be an absolute contra-indication.

Our object is to enable athletes to compete for a period which in some cases may be one of the most important times in their lives. I have outlined some of the physio-therapeutic methods which have been found useful in achieving this object and I have tried to outline the principles involved in the application of these methods.