IX. SPRAINED ANKLE : THE DIAGNOSIS AND TREATMENT

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Most doctors, and many of the public, regard the sprained ankle as a minor ailment. It is thought to be an unfortunate and irritating accident and not to be classified as a major illness. The majority of sprains do in fact get well without treatment, but in some cases the pain and disability, like bad music, lingers on.

It is the object of this article to discuss the rational treatment of the sprained ankle, and its early diagnosis, and to show how correct treatment can accomplish a rapid and complete cure without residual disability or the resort to intensive, but rather ineffective, physiotherapy.

In discussing the many lesions that can appear either singly or together and form the clinical syndrome of the sprained ankle, it is necessary to specify exactly what is meant by a sprain. A sprain is strictly a minor lesion of a ligament. It consists of the tearing of a few fibres, the mass of the ligament being intact. If, on the other hand, the ligament is completely torn, then the condition is not a sprain but a rupture and the treatment of these two conditions differ widely.

The object in the treatment of a sprain is to eliminate pain and to accelerate healing while at the same time maintaining the mobility of the part. With a rupture no amount of immobilization is likely to secure healing and it will be necessary to consider surgical repair in order to reconstitute the completely torn ligament and to secure a sound result.

The differentiation between these conditions is relatively simple and there should be no confusion in the diagnosis. In the sprain, on stretching the sprained ligament, the increased tension gives rise to acute pain, since this structure is partially torn and its inflamed nerve endings are exquisitely sensitive; but in the rupture, on stretching the ruptured ligament, there is increased mobility but little pain, since the ligament is completely divided and there is therefore no tension.

In treating a sprain it is not necessary to completely immobilize the joint, since only a few fibres are torn and it is unlikely that further trauma will occur to tear the remainder of the fibres which go to make up the whole body of the ligament. It will be shown below how complete immobilization of the part leads only to avoidable trouble.

The different lesions which may be present in sprained ankle will now be considered:

THE LATERAL COLLATERAL LIGAMENT

The lateral collateral ligament is composed of 3 separate parts (Fig. 1):

(i) the anterior talo-fibular ligament running from the anterior aspect of the fibula to the neck of the talus,

(ii) the fibulo-calcaneal ligament running from the under surface of the fibula to the calcaneus, and

(iii) the posterior talo-fibular ligament running from the posterior aspect of the fibula backwards to the talus.

Sprain of the Distal Attachment of the Anterior Talo-fibular Ligament

Much the commonest sprain on the lateral side of the ankle-joint takes place at the distal attachment at the anterior talo-fibular ligament (Fig. 1 : 1). There is not much pain or disability associated with this lesion. The patient usually stumbles and twists his ankle and complains of pain over the neck of the talus. If the foot is plantar-flexed and inverted, so as to apply tension to the ligament (Fig. 2) the patient will complain of severe pain. Likewise pressure over the neck of the talus, at

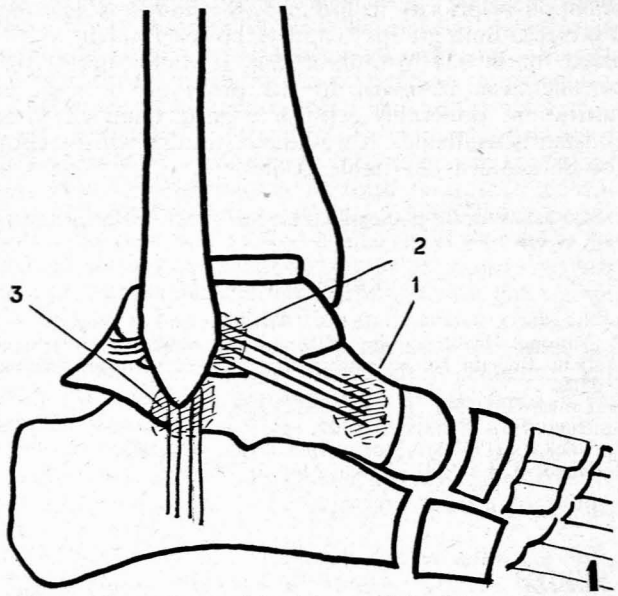

Fig. 1. The anatomy of the lateral collateral ligament of the right ankle-joint. 1. The site of the sprain at the distal end of the anterior talo-fibular ligament. 2. The site of the sprain at the proximal end of the anterior talo-fibular ligament. 3. The site of the sprain at the proximal attachment of the fibulo-calcaneal ligament.

the distal attachment of the ligament, will give rise to pain.

When the patient is seen first there may be considerable swelling around the ankle-joint and it is sometimes hard to differentiate a sprain from a fracture of the lateral maleolus. This can easily be accomplished by pressing the fibula at a higher level well above the area of swelling. If there is a fracture then crepitus will occur between the bony fragments, giving rise to acute pain at the fracture site. If, however, the patient is only suffering from a sprain, no unpleasant sensation will be felt.

Treatment. Immobilization is not required. The ankle may be strapped in eversion with extension plaster and elastoplast. The strapping will give a feeling of support and will also limit the swelling. The strapping should cover the foot from the base of the toes and it should extend two-thirds of the way up the calf. The patient should be instructed to carry on with normal exercise and should be encouraged to walk since this will definitely diminish the amount of the haematoma and oedema associated with the sprain. If the patient is active and carries out these instructions a cure can be effected within 5 days. Injections of local anaesthetic into the tender area can only offer temporary relief and will do nothing to materially hasten the process of healing.

Sprain of the Proximal Attachment of the Anterior Talo-fibular Ligament

The second most common area to be sprained is the proximal attachment of the anterior talo-fibular ligament (Fig. 1 : 2). Here a few fibres are torn from the lower end of the fibula giving rise to considerable pain. The patient is, however, able to walk after this injury until about 2 hours have elapsed, when increasing pain and stiffness make walking difficult.

The proximal attachment of this ligament is closely associated with the capsule of the joint and when it is sprained some trauma is transmitted to the capsule causing irritation and giving rise to an effusion. The patient will then complain of being unable to walk properly and will prefer to walk on his toes because the plantar-flexing of the ankle enlarges the cavity of the joint so that the fluid can be accommodated; if, however, the ankle is dorsi-flexed and weight is taken square on the foot, the capsule will be ballooned anteriorly, which gives rise to acute pain.

Aspiration of the ankle-joint at this stage can be performed and this gives immediate relief; but this measure is not often necessary. Strapping of the ankle joint in slight eversion will relieve most of the symptoms, and the patient should then be instructed to walk on the foot as much as possible.

Many practitioners regard a severe sprain as an indication for plaster-of-paris fixation which, initially, serves to give relief from pain; but the later results of treatment by this method are not free from complications. As the sprain heals and the haematoma organizes, adhesions will be formed between the ligament and the capsule of the joint. If, on the other hand, the patient continues to exercise the joint, one can expect a sound and satisfactory result in 3 weeks. The movement of the capsule adjacent to the sprain delays healing somewhat but there will be no adhesions. If, however, the patient has been treated in plaster or has not exercised the ankle during the period of healing, adhesions will form between the ligament and the capsule; then as the patient walks the capsule of the ankle-joint is irritated, which causes swelling of the joint, and he will complain of pain on exercise and swelling towards the end of the day.

Unfortunately, this type of lesion is commonly ignored by the practitioner, who considers a little massage sufficient to mobilize the joint. It is classified as 'an old sprain—not much one can do for it, it will get better on its own'. From this misdiagnosis, and the lack of improvement that follows, the patient eventually consults a chiropractor. The chiropractors have only one form of treatment and in such cases as these it is a most successful measure. They manipulate the joint, and when the adhesions are snapped the patient feels the ankle giving way and hears the click. He is then informed that a little bone has gone back into place, and as he is cured he is highly delighted and proceeds to broadcast the results of this 'miracle' to his friends.

The medical practitioner can never compete with the chiropractor until he appreciates the true nature of this lesion. He should realize that by his early treatment and advice he should keep the ankle-joint moving. If, however, he fails in this he should be the first to recognize the lesion and recommend manipulation of the joint, because by ignoring the condition he leaves the patient with considerable disability which is definitely remediable.

The Diagnosis of Adhesions. To make a correct diagnosis of adhesions before recommending manipulation, the practitioner should note:

(*a*) The history of trauma,

(*b*) the persistence of swelling and/or pain for more than 4 weeks,

(*c*) limitation of movement when stretching the affected ligament, and

(*d*) that tension on the affected ligament still gives rise to pain.

(*e*) An X-ray should be taken in order to exclude a fracture that may have been missed initially.

Manipulation of the Ankle-joint. This is preferably carried out under general anaesthesia. The ankle-joint should be moved once only through the full range of movement. The snapping of the adhesions will be felt quite distinctly. Following the manipulation the patient must be encouraged to move the joint to the limit of its normal range at least 3 times a day for a period of 3 weeks; otherwise the ligament will again become adherent to the capsule. Massage is valuable in the apprehensive patient because the masseur makes sure that the normal range is maintained.

Sprain of the Fibulo-calcaneal Ligament

The third and last lesion which occurs in the lateral collateral ligament is a sprain of the proximal attachment of the fibulo-calcaneal ligament (Fig. 1 : 3). This may be recognized by tenderness under the tip of the fibula and the complaint of pain on inversion of the foot with the ankle in the neutral position. This again takes 3 weeks to heal; it should be treated with strapping. Usually it gives rise to no disability although occasionally, if it has been treated in plaster, repeated swelling and pain can occur. The same remarks apply to this strain as to that of the anterior talo-fibular ligament and the patient should be instructed to keep the joint moving at all costs.

OTHER LIGAMENTS

Sprain of the Medial Collateral Ligament

The deltoid ligament, which is attached proximally to the under surface of the medial maleolus fans out and is attached distally to the talus and to the calcaneous. Sprains occur only at its proximal attachment, and these are rare. If, however, a sprain of this ligament is diagnosed by pain and tenderness under the tip of the medial maleolus (Fig. 3), and if this appears to be the sole lesion, a fracture of the fibula should be suspected; for it is nearly impossible, mechanically, to strain this ligament without some damage taking place on the outer side of the joint, because in the mortice of the ankle joint the fibula extends further distally than the medial maleolus.

Treatment. There is no need to consider the treatment of this lesion in a special light. Strapping of the joint in inversion is sufficient to relieve the patient of the acute symptoms. Occasionally there is an effusion present but usually the lesion is mild and active exercises should be instituted at once in order to avoid the formation of adhesions.

Sprain of the Tunnel of Tibialis Posticus

This may occur as a complicating factor in sprains of the ankle. The tenderness is, however, $\frac{1}{2}$ inch below the tip of the medial maleolus and should not be confused with that of sprains of the deltoid ligament. Abduction of the forefoot gives rise to pain, and tenderness over the tendon tunnel can easily be elicited. Occasionally one can also feel crepitus as the tendon moves in its tunnel.

The treatment here may be different. The patient is really suffering from teno-synovitis and in the acute stage an injection of hydro-cortone into the tendon sheath will often dramatically relieve the symptoms. If, however, the condition persists a tilt on the inner side of the heel of the shoe, to diminish the strain of the tendon on its tunnel, gives a very beneficial effect. Usually the condition heals within a few days.

Sprain of the Inferior Tibio-fibular Ligament

The mortice of the ankle joint is controlled by the inferior tibio-fibular ligament. This ligament, running

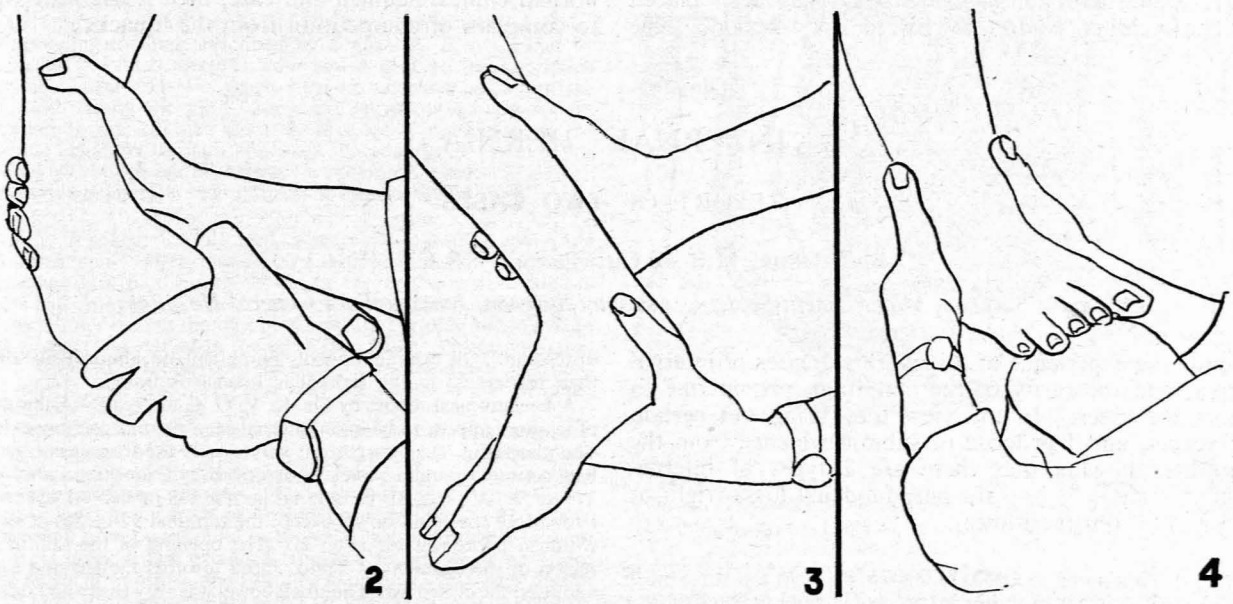

Fig. 2. The foot is forced into plantar flexion and inversion to test the anterior talo-fibular ligament. *Fig.* 3. Tenderness under the medial maleolus indicates a sprain of the medial collateral ligament. *Fig.* 4. Testing for a sprain of the inferior tibio-fibular ligament. The hands are compressing the maleoli and the knee is pushing the foot up into dorsi-flexion.

from the outer aspect of the lower end of the tibia to the fibula, holds the fibula in apposition and so keeps the ankle-joint together. Occasionally the patient, stumbling with the foot forced into hyper-dorsi-flexion will cause a strain of this ligament to take place.

In the young subject with a normal ankle, movement of the foot from plantar-flexion to dorsi-flexion separates the tibia from the fibula by a distance of $\frac{1}{8}$-$\frac{1}{4}$ inch and this is accomplished by the superior articulating surface of the talus, which is broader in front than behind. If, however, this wedge is forced still further between the bones, the sprain, or even rupture, of the interior tibio-fibular ligament will take place.

The patient complains of pain and tenderness in a somewhat similar area to that of a sprain of the proximal attachment of the anterior talo-fibular ligament, but the differential diagnosis can easily be made on examination. The examiner grips the patient's ankle in both hands and compresses the tibula and fibula. With his knee he then moves the foot up into dorsi-flexion just short of the position where the pain occurs (Fig. 4). He then suddenly releases his hands, allowing the tibia and the fibula to spring apart. If there is a sprain of the interior tibio-fibular ligament the patient will complain of acute pain.

Treatment. Again it is unnecessary to consider plaster-of-paris as a form of treatment since this will only give rise to adhesions because of the complete immobilization. The strain, however, must be taken off the ligament in order to secure healing. It is, therefore, necessary to raise the heel of the shoe about $\frac{1}{2}$-$\frac{3}{4}$ inch so that the narrower posterior portion of the superior surface of the talus is presented in the mortice. This is effective in securing union but tenderness may continue for 6 weeks.

Teno-synovitis of the Tendo Achillis

This may be a complicating factor in sprains of the ankle joint, particularly where strain has been placed on the Achilles tendon by forced dorsi-flexion. The patient complains of pain and tenderness over the tendo achillis and on palpation crepitus may often be felt. To relieve this, tension should be taken off the heel string and this can be done by raising the heel $\frac{1}{2}$-$\frac{3}{4}$ inch. Usually this is sufficient and in about 3 weeks the condition settles down. If, however, the patient complains of acute pain, injections of hydrocortone into the sheath of the tendo achillis will be effective in causing resolution.

Teno-synovitis of the Long Extensors of the Toes

Occasionally in sprained ankles, where the injury is severe, and the foot has been forced into hyper-plantar flexion a teno-synovitis may occur in the long extensors of the toes. This is characterized by two swellings, one above and one below the ankle joint. The sheaths of the extensors communicate under the annular ligament. Pressure on one swelling will give rise to an increase in size of the other, and this can be considered a diagnostic sign. No treatment is necessary and the condition rapidly clears up.

It should be noted that all these lesions may occur in different combinations. A severely sprained ankle is often a multiple lesion, and each component should be carefully diagnosed in order to give an opinion as to the prognosis. At no time in the treatment of the sprained ankle is plaster-of-paris necessary since this only encourages stiffening of the joint and the formation of adhesions in the area, which may cause the patient residual symptoms long after the original lesions have healed.

The sprained ankle may be a complex matter and should be considered in that light. It should not be regarded as a lesion of minor importance; the patient has the right to expect at least the same degree of competence and interest from his doctor as he would receive from an unqualified practitioner. If the profession regards this condition as unworthy of the exercise of normal clinical acumen and care, then it has little right to complain of competition from the 'quacks'.