

WHITMAN (Royal)

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THE TREATMENT OF
PERSISTENT ABDUCTION OF THE FOOT,
COMMONLY KNOWN AS CHRONIC SPRAIN OF THE ANKLE.*

BY ROYAL WHITMAN, M. D., M. R. C. S.

THE successful treatment of any chronic affection demands a personal, persistent attention to details on the part of the surgeon. This is particularly true of the treatment of what are known as minor injuries, and therefore neglected.

One of this class, to which I propose to call your attention, is commonly known as chronic sprain of the ankle, an affection which may entail years of discomfort and disability, with permanent impairment of the functions of the foot.

The usual history of such cases is as follows: Long-continued weakness and discomfort, following an injury to the ankle, treated by various physicians with liniments, blisters, and bandages until the discouraged patient is told that nothing more can be done, but that his symptoms "will wear away in time." A year or two later he presents himself, usually for the purpose of procuring a brace,

* Read before the American Orthopædic Association at its fourth annual meeting.



or for some peculiar shoe which he thinks may be of service to him.

He complains principally of weakness, stiffness, and insecurity, of fatigue and pain in the foot and ankle on any overexertion. He walks with a somewhat awkward gait, the foot everted to avoid flexion at the ankle, with a very noticeable limp when fatigued; in fact, he walks as little as possible. On examination, one finds that the foot is abducted—that is, turned outward in its relation to the leg—that forced adduction and extension are resisted and are very painful to the patient. There may be some swelling, often of the dorsum of the foot, or in front and below the external malleolus. In other cases the ankle appears perfectly normal. The arch is not markedly diminished, but there is a prominence on the inner aspect of the foot, at the astragalo-scaphoid joint, caused by its abducted position. Thus, although in a well-marked case all the movements at the ankle and at the medio-tarsal joint are somewhat restricted, those of adduction and extension are almost lost, there being a spasmodic contraction of the peronei and extensor longus digitorum, with shortening of ligaments and fascia on the outer side, varying according to the time the foot has been held in its improper position. The amount of abduction varies. In many cases there is simply a slight limitation of adduction and almost no spasm of muscles. In others, usually in young subjects, there is a tonic contraction of the abductors, raising the outer border of the foot and throwing it into a position of marked deformity, presenting the appearances of what is sometimes called spasmodic valgus.

In making the diagnosis of this condition, it is important, as a preliminary measure, to test the movements of the foot—(1) in relation to its fellow; (2) to the normal range of motion. This varies considerably with the age or

personal peculiarity of the patient, but, according to a number of measurements, the average is about as follows:

Forced flexion, 70° to 80° . Forced extension, 140° to 150° .

Adduction is much more difficult to determine, but it may be said that a person sitting, holding the leg perpendicular to the floor, the foot being somewhat extended, should be able to raise its inner border until the sole forms an angle with the floor of about 60° to 40° .

In this position the patient with persistent abduction of the foot is usually unable to raise the inner border at all.

I wish to call your attention particularly to the fact that a foot with persistently restricted motion in any direction, especially in that of adduction, is in no condition to recover under treatment by blisters, bandages, or rest, unaided by other means. Sprains of the character we are considering are usually caused by a fall from a height, or by the body turning outward over the foot, straining and rupturing the internal lateral ligaments, a more sudden violence producing in the same manner a Pott's fracture. Either as the direct result of the accident, or from the subsequent weakness of the internal ligaments, a subluxation of the astragalus takes place downward and inward, while the remainder of the foot is thrown outward, so that a disturbance of the muscular equilibrium results. The adductors, working at a disadvantage, are unable to perform their functions, while the abductors, the peroneii, and extensor longus digitorum, in the effort to hold and steady the foot, are thrown into a state of spasmodic contraction, so that it is, as has been described, rigidly held in abduction, while the power of adduction is limited or lost.

Abduction of the foot is the position of weakness; adduction, that of strength and activity.

In other words, the usefulness of the foot depends upon the preponderance of power of the adductor muscles. When this is lost, weakness and pain ensue. If this proposition is accepted, the treatment becomes simple :

1. To overcome the contraction and spasm of the abductors.

2. To strengthen the adductors.

This can best be accomplished as follows :

The patient being etherized, the affected foot is forcibly extended and adducted—that is, the heel and toes are both turned inward, so that the inner border of the foot is bent like a bow ; it is then forced inward under the leg to a position of extreme equino-varus, the operation being attended with audible cracking of adhesions in all the disused articulations. In this position a well-fitting plaster bandage is applied, with the object of persistently overstretching the shortened ligaments and contracted muscles and holding the foot firmly in its new position.

The pain after the operation is much less than might be supposed from the violence that is often necessary to accomplish the result.

The bandage may remain on a variable length of time according to the subsequent pain and the difficulty that has been experienced in the reposition. From one to three weeks is the average time. When it is removed, the foot, though in good position, is usually somewhat swollen, sensitive to pressure, and all its movements are limited and often painful. Now a course of massage is necessary, gentle at first, followed by bandaging and complete rest. In two or three days, when the swelling has subsided, the patient begins voluntary exercises, assisted by the surgeon, the attempt being made to place the foot in the position of adduction—that is, to regain the motion that was lost. Thus, the patient contracts the adductors and flexors,

while the surgeon aids, by gently pressing at the same time on the dorsum of the foot. At the conclusion of the exercise the surgeon, holding the foot firmly, turns it slowly inward toward the position of equino-varus, and retains it there until the involuntary resistance diminishes. This movement is usually accompanied by a very painful sensation of stretching in the muscles and ligaments of the outer border of the foot, which gradually diminishes as the foot returns to its normal condition. This portion of the treatment, described by the patients as "twisting," is by far the most important. Patients strongly object to it at first, but afterward submit to it willingly, as it relieves the sensation of painful stiffness, while the gain in range of motion after each application is very evident. When the pain and stiffness have diminished, usually in from one to three weeks, the patient is allowed to use the foot.

As the foot was formerly everted in walking, he now walks with the toes directly in front of the body, so that the flexors and adductors must be exercised with every step. He is to wear a Waukenphast shoe, as its inward twist aids in holding the foot in proper position. If necessary, its inner border may be built up, after the method of Thomas. I invariably use the foot brace, which has already been shown the society, to support the foot and prevent abduction until the patient by constant exercises and avoidance of improper positions has allowed the foot to return to its normal condition. These exercises are very simple :

1. The movements of adduction and extension which have been described.

2. Raising the body on the bare toes twenty to thirty times morning and night, as recommended by Ellis.

3. And most important, a correct walk, by which the body must be raised upon the foot at every step, as described in Vol. I of the *Orthopædic Transactions*.

The successful treatment of this class of cases may, I apprehend, be summed up as follows :

Discover what movements of the foot are restricted, with the apparent causes.

Then a persistent endeavor to overcome such restriction—

1. By forcible reposition to break up adhesions and to overstretch the contracted muscles and ligaments.

2. A long-continued massage intelligently applied by the surgeon.

It is not sufficient to order rubbing of the foot—this has been done by the patient for months—but a manipulation diligently carried out with the purpose of stretching the shortened ligaments and overcoming the contraction and spasm of muscles.

3. A re-education of the patient as to the proper positions and movements of the foot.

This course of treatment is often long, tedious, and painful, but it is, I believe, the only one which may restore the injured member to strength and usefulness, and if the patient and surgeon are not prepared to carry it out, it is better for both that the attempt should not be made.

Having spoken of the treatment of this affection, we may now consider how such a condition may be avoided.

The surgeon called upon to treat a recent injury to the ankle should remember that the subsequent disability is almost invariably the result of abduction, because the original injury is usually to the internal lateral ligament and those of the medio-tarsal joint.

Consequently, it seems reasonable, in a sprain of any severity, to place the foot for several days in a well-fitting plaster bandage in the position of adduction, to guard against a possible subluxation of the astragalus, and to relax the injured ligaments and muscles ; then a course of mas-

sage until the swelling has subsided and all the movements of the ankle and foot have been regained and are painless, with the temporary use of a foot-brace if necessary.

In conclusion, the history of many of these patients would seem to show a very discreditable ignorance among physicians as to the appearance of a normal foot and of the injuries and diseases to which it is liable. A sufferer from non-deforming club-foot, persistent abduction of the foot, or flat-foot, usually goes from physician to physician only to receive a prescription for a new liniment or antirrhematic medicine.

Even when a correct diagnosis is made, surgeons are too often content with temporary relief, rather than insisting on the persistent treatment which may result in cure.

NOTE.—The term "persistent abduction" is used simply to describe the actual condition of an affection which is not flat-foot, yet nearly allied to it. At the reading of this paper it was suggested that there were two distinct classes of cases presenting the appearances described, one of which was purely neurotic and might be cured without reference to the local condition of the foot. Such cases must be extremely rare. Disordered reflexes may increase the effect of a local trouble, and a poor general condition must be treated as well as the local affection; but, other things being equal, the writer believes that the best way to treat neuroses, if such exist, producing the symptoms above described, will be to break up the adhesions, to replace the foot in normal position, to strengthen and re-educate its muscles in the manner already described.



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