

DISTORSIO PEDIS WITH AN ISOLATED LESION OF THE LIGAMENTUM CALCANEO-FIBULARE

By

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Isolated injuries of the Lig. calcaneo-fibulare following sprained ankle appear to be rare. We found it to occur only twice amongst 31 patients who underwent operative correction for habitual or recurring Distorsio pedis.

Several publications concerning the findings on the ligaments during treatment of Distorsio pedis at the orthopaedic clinic in Zurich as well as the therapy are available¹. Considerable changes were reported in all cases: ligaments proceeding from the lateral malleolus were stretched, torn, or ripped off, often, even resorbed. In a few cases it was noted that the turn-off ligament had found its way into the joint where it caused erosive changes of the joint cartilage; we had the impression that with these cases the pain was particularly intense.

Ligamentoplasty on the lateral malleolus has been carried out on 27 patients during the last 5 years; in addition, one patient from the year 1952 was reported on by Müller & Gschwend in 1956. 3 of the patients had bilateral distorsions; therefore, in the following table, the findings are given for 31 feet for 28 patients.

Findings in the Ligaments with Recurring and Habitual Distorsio pedis.

	Stretched	Torn or ripped off	Ligament pieces occurred in the joint	Absent
Lig. talo. fib. ant.	10	15	6	1
Lig. calc. fibulare	8	3	1	6
Lig. calc. talare	2	3	1	2
Lig. talo-naviculare dorsale	2	—	—	—

¹ Müller & Gschwend 1956; Gschwend 1958; Francillon 1959-61; Kohn 1961.

Two patients demonstrated bilateral habitual distorsions in supination. Exploration revealed merely lax, severely stretched ligaments. It is possible that these two patients belong to the group with primary lax ligaments which, according to the finding raised by *Bonin*, comprises about 4 % of the population. It appears certain that this habitual twisting in inversion is often insignificant. We must, however, be aware of the fact that frequent distorsions can lead to injury of the joint cartilage and especially to the contact surface of the talus. Therefore, these injuries should not be regarded as totally insignificant.

With all other patients, recurring distorsions were present in which the initial trauma had occurred from $\frac{1}{2}$ to 30 years previously.

The table shows clearly that, as a rule, the lig. talo-fibulare ant. is most frequently injured. This corresponds completely to the results obtained from the well known experiments on corpses from which it was learned that with inversion in plantar flexion a stretching first occurs followed by tearing and the ripping off; only by continuation of the inversion movement does a tearing of the lig. calcaneo-fibulare occur (*Bonnet; Tillaux; Güttner; Stähli; Leonard; Anderson et al.*).

It should be mentioned that among these 27 cases of post traumatic recurring *Distorsio pedis* we found two cases of osteochondrosis dissecans lat. tali in the sense of a flake fracture as has been reported, amongst others, by *Röden, Tillegård & Unander-Scharin*, and then from *Mau, Gschwend et al.*

No discussion of symptomology or diagnosis is required here; they are well known. The great value of X-rays in certain positions is also well known (*Güttner, Cosentino et al.*). They can be of decisive significance for the diagnosis, not, however, unconditionally, as is demonstrated by cases with an isolated lesion of the lig. calcaneo-fibulare. An isolated lesion of the lig. calcaneo-fibulare was observed twice in 27 cases of posttraumatic recurring distorsion. In one of the 2 cases, it was possible to make the diagnosis pre-operatively, in the other, a general diagnosis of a ligament injury was made and only during the operation was it possible to localize the injury to the lig. calc. fib. Inasmuch as the X-rays—in a held position—can give negative results leading the physician to more or less dismiss the complaints of the patient, these cases appear to be exceptionally important to us. The one case, however, was very instructive for us in that we were able to make the diagnosis—which was confirmed operatively—by correlating the *Myokinetic examination* with the complaints of the patient.

The 16 year old female patient N.K. (H.21504) was first examined

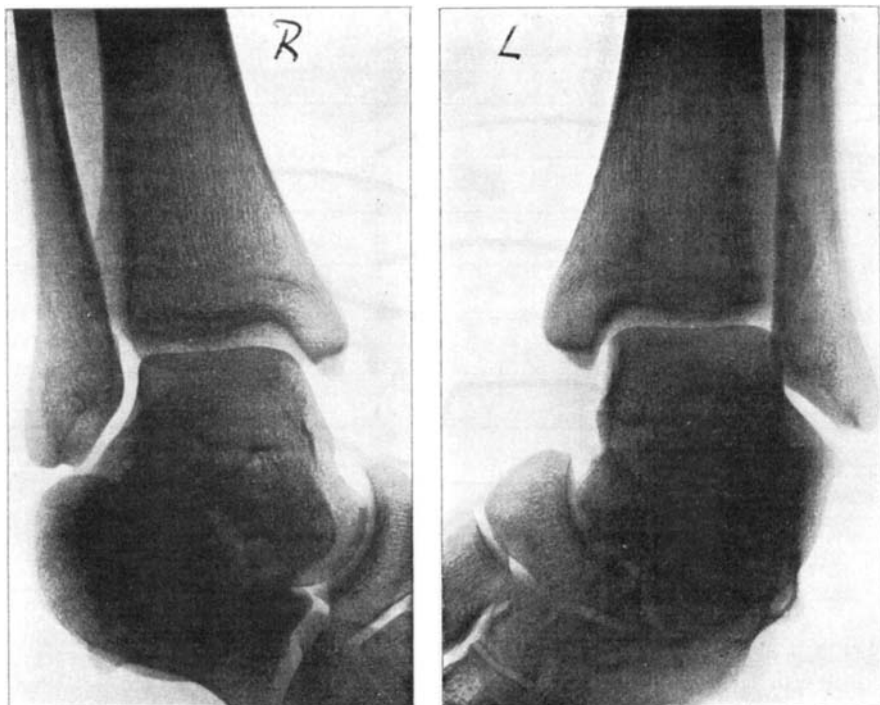


Fig. 1.

Distorsio pedis sin. with tearing of the Lig. calcaneo-fibulare. N. K. H. 21504. Held X-ray exposure in inversion. No important difference between left and right.

by us in October of 1961. For the last 2 years, she had suffered frequent twisting of the left foot in supination and probably following a distortion about which, however, the patient was rather vague. Pain was absent, there was considerable weakness and unsteadiness, however, in walking.

Findings: No impediment in gait. Obvious pedis valgi slightly stronger on the left. Fibula in the distal tibio-fibular connection on the left slightly more mobile. Bilateral pressure sensitivity in the region of the lig. talo-fib. ant. more pronounced on the left. Pressure sensitivity under the tip of the left lateral malleolus.

X-ray: Even in the held position, no incongruence in the talo-crural joint. Joint surface of the tibia and talus completely parallel. The lateral exposure in maximal plantar flexion also revealed nothing abnormal. There was a suggestion of a spreading of the malleolar fork (Ill. 1).

Kinetic examination: Normal behavior of the extensors on both sides.

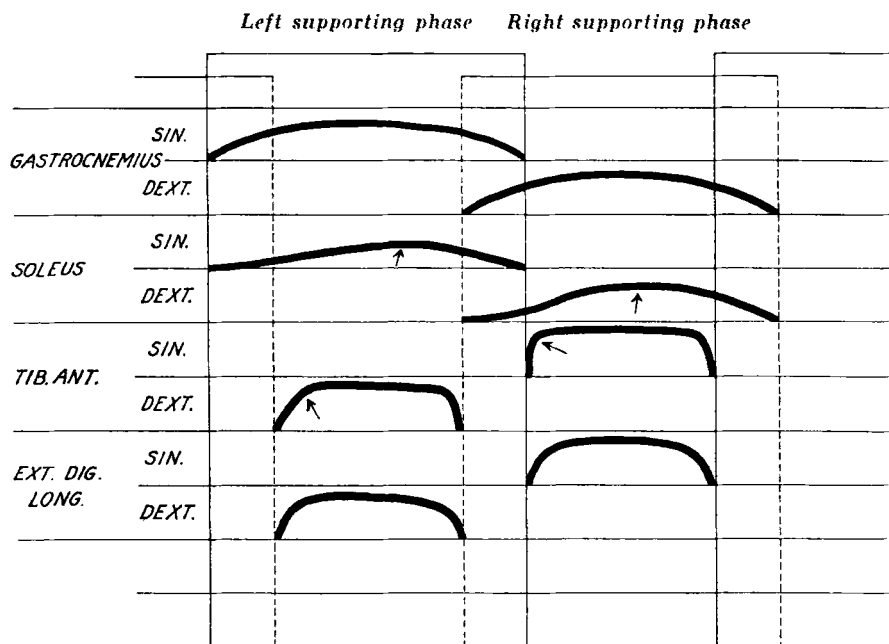


Fig. 2.

Distorsio pedis sin. N. K. H. 21504, 16 year old female patient.
Myokinesigram 2 years after Distorsio pedis sin. Slight hypergy of the left soleus.
Action curve of the left tib. ant. steeper.

The action curve of the tib. ant. was, however, steeper—i.e. quicker on the left. No definite abnormality could be found in the action of the gastrocnemius, on the other hand, a very slight hypergy of the left soleus was present (Ill. 2).

The myokinetic finding was, therefore, rather slight. Both the hyperchry of the tib. ant. and extensors as well as the generally considerable hypergy of the triceps surae so often present in these cases of recurring distorsion were absent.

Despite the rather unconvincing kinetic findings, they were sufficiently adequate to allow an objectification of the patient's complaints and to lead us to an assumption of a traumatic-induced instability of the talo-calcaneal joint.

This assumption was confirmed during operation. The lig. talo-fibulare ant. was completely intact. The lig. calcaneo-fibulare, however, was torn off from the fibula (N.b. negative X-ray findings on the fibula). In addition, the joint between the talus and calcaneus could

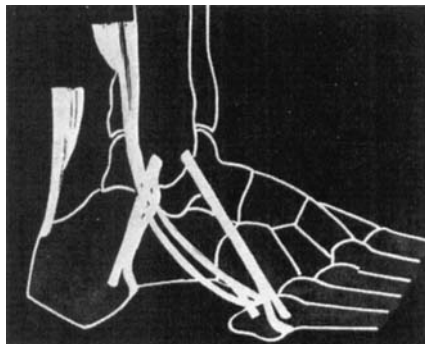


Fig. 3.

Schematic table of the ligament plasty with corium strip (from *Francillon, Verh. Deutsch. Orthop. Ges.* 1960).

be opened abnormally wide. The ligament still inserted on the calcaneus was resected. Thereafter a plastic procedure was carried out with a corium strip conserved in Cialite as is usual in such cases at our clinic.

Pathologic-anatomic diagnosis: "Avulsion of the lig. calcaneo-fibulare. Histologically, the surgical material consists of a tense, fibrous, tendonlike tissue ... On one side the fibrous tracts are often mangled and torn up.

Young connective tissue rich in fibrocytes is already sprouting at positions where the ligament was torn" (Institute of Pathology of the University of Zurich: Chief: Prof. *E. Uehlinger*, M.D.).

In the second case in question (J.B. H. 21517, 20 years old) complaints were also made because of pronounced instability, which arose after a severe Distorsio pedis of the right foot which occurred 2 years previously. The instability was so severe that the foot tipped over into supination 2 or 3 times daily; pain set in after one hour of walking and sports activity, i.e. skiing, was no longer possible. No incongruency in the talo-crural joint was demonstrable in the usual held X-ray exposure; only with abnormal maximal inversion was an indication of incongruency recognizable. During operation, a completely intact lig. talo-fibulare ant. was found; on the other hand, the lig. calcaneo-fibulare was found to be lax and obviously overstretched. In this case also, a ligamentoplasty with a cialite corium strip was carried out.

With regard to the accident mechanism we can assume that, for these 2 cases, it deviated a bit from the usual mechanism of distorsion.

As a rule, *Distorsio pedis supinatoria* occurs in the equinus position of the foot whereby an overstretching or tearing of the lig. talo-fibulare occurs primarily with or without secondary implication of the lig. calcaneo-fibulare. This mechanism is out of the question for cases like above 2 described. It is much more plausible to assume that the foot was either in a middle position (90°) or in maximal dorsiflexion as it tipped over into inversion. To be sure, in these cases, a fracture of the malleolus is more likely to occur than an isolated tear of a ligament.

The operative therapy in these cases is fundamentally the same as in those cases with injury of the lig. talo-fibulare ant. and which has proven successful in all of our cases with but one exception. A corium strip is drawn through the lateral malleolus, one end of which—under sufficient tension—is drawn through a bony canal in the tuberositas met. V and fixed there, while the other end is osseously fastened on the calcaneus. The skin strip is either taken from the patient's thigh or from the cialite skin bank.

Details of technique will not be studied in this paper. The reader is referred to earlier papers from our clinic in which the justification for our preference for the well known method of *Watson-Jones*, i.e. its modification by *Imhäuser*, is presented.

S U M M A R Y

A report is given concerning operative findings in *Distorsio pedis* with consideration of the possibility of an isolated injury of the lig. calcaneo-fibulare.

Z U S A M M E N F A S S U N G

Bericht über operativ behobene Befunde bei habitueller und reizdividierender *Distorsio pedis* unter Hinweis auf die Möglichkeit einer isolierten Schädigung des Ligamentum calcaneo-fibulare.

R E S U M E

Rapport sur les constatations opératoires faites au sujet de lésions ligamentaires des entorses du coup-de pied. Possibilité d'une lésion isolée du ligament calcanéo-péronéen.

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