Acta orthop. scand. 52, 363–366, 1981

LATERAL LIGAMENT RECONSTRUCTION OF THE ANKLE WITH A MODIFIED WATSON-JONES OPERATION

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A modified Watson-Jones technique, using only half of the peroneus brevis tendon, was applied as an operative procedure for lateral ankle instability. Twenty-nine patients with 30 operated ankles were examined with an average follow-up period of 7 years and 6 months. Functional stability was achieved in all but one of the operated ankles. In 15 cases there were periodic pains and swelling on activity, while the remaining 14 ankles were without symptoms. Supination of the foot was slightly decreased in 4 cases.

Key words: ankle joint; ankle instability; ligament reconstruction

Accepted 18.xi.80

Chronical instability of the ankle joint may be a severe disability which indicates operative treatment. A great number of operations have been designed but the ideal operation, one which in all cases recreates a pain-free and stable ankle with normal function, probably does not exist. In some reports a direct suture of an old ligament rupture has been used (Broström 1966, Solheim & Aasen 1976), but with 14–15 per cent residual instability. The great majority of authors have used a ligament reconstruction with fascia or tendon (Broström 1966). One of the most widely used techniques is the Watson-Jones method (Watson-Jones 1940, Anderson & Lecocq 1954, Gillespie & Boucher 1971, Hedeboe & Johannsen 1979), in which the peroneus brevis tendon is passed through drill holes in the lateral malleolus and the neck of the talus. This operation usually results in good stability, but decreases the normal movement of supination between the talus and calcaneus (Broström 1966). In addition, the foot is deprived of one of its pronators so that an unsuccessful operation may cause an aggravation of the preoperative condition (Hedeboe & Johannsen 1979).

The present series describes a modified Watson-Jones operation using only half of the peroneus brevis tendon and the results of this method are reported.

MATERIAL AND METHODS

The indication for the operation was lateral instability of the ankle joint, and 33 patients were operated on during the period 1964–1978.

The age of the patients at the time of operation varied between 11 and 56 years with an average of 27 years. There were 14 men and 19 women.

Prior to the operation all patients had suffered one or more sprains of the ankle. Seven patients had been treated with a plaster cast for some weeks while in the remaining cases a supportive elastic bandage or no treatment had been used.

In addition to the clinical examination radiographs were taken. The roentgenographic examination included inversion-stress exposures of both ankles. The angle of talar tilt was measured according to the method described by Rubin & Witten (1960). In order to demonstrate an anterior drawer sign the roentgenographic follow-up examination was supplemented by a lateral view of both ankles in which the foot was fixed and the tibia loaded with 10 kg.

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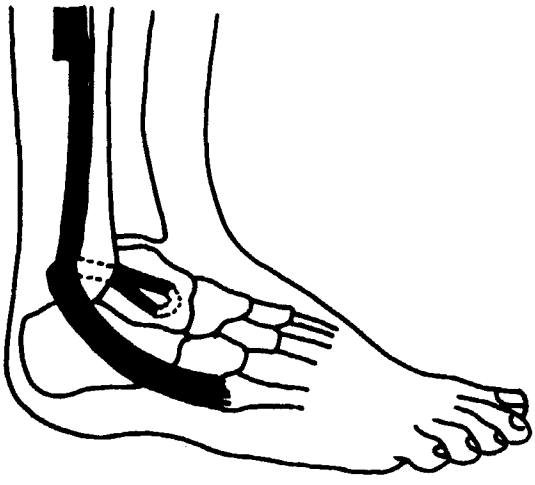

Figure 1. The present modification of the Watson-Jones operation.

The patients were operated on under general anaesthesia and a tourniquet was used. An incision was made from approximately 15 cm above the lateral malleolus, extending downward along the lateral side of the leg and forward below the lateral malleolus. Following this, half of the peroneus brevis tendon was freed as far as the lateral malleolus. Care was taken not to disturb the peroneal retinaculum. Drill holes were made through the lateral malleolus and in the outer margin of the neck of the talus adjacent to the articular surface. The released tendon was passed anteriorly through the lateral malleolus, further through the talus, and redirected back through or across the lateral malleolus (Figure 1). It was tightened and sutured to itself and the periosteum behind the lateral malleolus. In addition, the two parts of the tendon between the lateral malleolus and talus were sutured together. The foot was fixed with a plaster cast in a right-angled and slightly pronated position for 6 weeks.

At the follow-up, 3 patients were living abroad and one patient refused to participate in the examination. The follow-up material includes the remaining 29 patients. Because one patient had both ankles operated on the total number of operations was 30. The average follow-up period was 7 years and 6 months and the minimum follow-up period 1 year.

RESULTS

As seen in Table 1 all the patients had pain in the ankle before the operation. At the follow-up 7 patients had mild and periodic pains on activity.

Functional stability was achieved in all but one case (Table 2). This patient also suffered from recurrent sprains. Swelling occurred in 9 cases, especially after walking for some time.

At the clinical examination swelling was not seen in any case. In 7 ankles some tenderness was elicited by palpation of the operated area and in 5 there was changed sensitivity over the lateral malleolus.

The total movement of the ankle joint averaged 55 degrees and all but 3 patients had normal plantar flexion. These patients lacked 10–20 degrees of plantar flexion. The subtalar movement was normal in 25 feet. In 4 cases the supination was slightly decreased. A patient with previous subtalar fusion had no subtalar movement. None of the patients complained of stiffness of the ankle.

Weakness of active pronation was not demonstrated. Eight patients had an average calf atrophy of 1 cm.

Table 1. Pain

	Before the operation	At the follow-up
No pain	0	23
Mild and periodic pain	22	7
Severe and constant pain	8	0
	30	30

Table 2. Functional instability, sprains and swelling

	Before the operation	At the follow-up
Functional instability	30	1
Sprains	30	2
Swelling	27	9

Table 3. The talar tilt angle

	Before the operation	At the follow-up
0°	0	11
1– 5°	0	15
6–10°	11	4
>10°	19	0
	30	30

The average talar tilt angle was reduced from 12.3 degrees before the operation to 2.7 degrees at the follow-up. In 26 cases the angle was below 6 degrees and in 4 cases between 6 and 10 degrees (Table 3). A patient with a talar tilt angle of 9 degrees had a slight clinical lateral instability, but did not complain of functional instability.

An anterior drawer sign could not be measured on the stress-roentgenograms. The roentgenograms were also examined for arthritic changes but these were not present.

Three patients changed their work after the operation while the remaining patients resumed their usual work. Before the operation 21 patients were active in sport and at the follow-up 9 of these had resumed their sporting activities.

The patients were asked for a personal opinion of the results of the operation. In 14 cases there were no symptoms from the ankle, in 15 cases the patients reported considerable improvement including ankle stability and only in one case was the condition unchanged. The last patient, who still complained of functional instability, had a clinically stable ankle joint and a talar tilt of 4 degrees.

DISCUSSION

The present technique, like the original Watson-Jones method, reconstructs primarily the anterior talofibular ligament, which is the most important ligament of the ankle (Cedell 1975). In addition, there is a stabilizing effect on the subtalar joint caused by the insertion of the peroneus brevis tendon into the fifth metatarsal bone and by the pull the transplanted tendon exerts on the peroneal retinaculum. The advantage of using only half of the peroneus brevis tendon is that the continuity of the tendon is not broken, and thus the peroneus activity is disturbed as little as possible. The use of only part of the peroneus brevis tendon was recommended by McLaughlin (1959) and recently good results with this technique have been reported (Heim & Famos 1977, Habekost et al. 1978). More complicated methods (Elmslie 1934, Chrisman & Snook 1969, Solheim et al. 1980) aim at a reconstruction of both the anterior talofibular and the calcaneofibular ligaments with the intention of avoiding subtalar instability. However, subtalar instability was not demonstrated in the present series at follow-up.

Lateral stability of the ankle can be assessed by the talar tilt. This ranges up to 23 degrees in normal asymptomatic ankles, with the majority being between 0 and 5 degrees (Rubin & Witten 1960). In a material of young individuals with no history of ankle injuries, only 7 out of 404 ankles showed a talar tilt over 5 degrees (Cox & Hewes 1979). Consequently the authors concluded that there is a high probability that a talar tilt over 5 degrees would represent a significant injury to one or more of the lateral supporting structures of the ankle. Accordingly all our patients had preoperatively a talar tilt of more than 5 degrees. The talar tilt angle was significantly reduced by the operation and was in all but 4 cases between 0 and 5 degrees at the follow-up. The remaining 4 patients with an angle between 6 and 10 degrees, however, had good functional stability.

The most significant feature of the results in the present series is, in fact, that in 29 out of 30 ankles (96 per cent) there were no subjective feelings of instability. The subjective feelings of instability in the remaining patient could not be explained clinically or radiographically. Freeman et al. (1965), however, found that ligamentous injuries of the foot and ankle frequently produce a proprioceptive defect affecting the muscles of the injured leg, and that such a defect is responsible for the symptom of "giving way" of the foot.

Some patients in the present series had periodic pains and swelling on activity but the symptoms were mild and in no case was it necessary for the patients to use supportive bandages.

The original Watson-Jones method may result in decreased supination of the foot, caused by tautness of the transplanted peroneus brevis tendon, in a rather high percentage of cases (Hedeboe & Johannsen 1979). In this series there were only 4 ankles (13 per cent) with slightly decreased supination.

It is generally accepted that primary repair of lateral ligament rupture of the ankle is superior to a secondary reconstruction (Ruth 1961, Freeman 1965, Reichen & Marti 1974, Cedell 1975). However, if reconstruction is necessary, the present method may be suggested as a rational alter-

native to the other available operations for lateral ankle instability.

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