Watson-Jones Tenodesis for Chronic Ankle Joint Instability
Maj M Eskander
FRCS(Ed), RAMC

Lt Col R Macdonald
FRCS, RAMC
Cambridge Military Hospital, Aldershot, Hants GU11 2AN

SUMMARY: Twenty-three patients (22 soldiers and 1 civilian) were admitted to the Cambridge Military Hospital between May 1990 and May 1992 with chronic inversion instability of an ankle and underwent Watson-Jones Tenodesis. A retrospective study was carried out to evaluate their results.

Introduction
A rupture of one or more of the lateral ligaments of the ankle is a common occurrence following severe inversion injuries. Over a period of one year, more than 330 patients were seen at the Casualty Department at the Cambridge Military Hospital with soft tissue injuries to their ankles secondary to sporting injuries. The treatment of acute rupture of the lateral ligaments of the ankle remains controversial. Freeman in 1965 reported that the initial management of these injuries did not alter the incidence of chronic laxity (1). For chronic lateral ligament laxity of the ankle, many surgical procedures have been described in the literature; of these Watson-Jones (2) and Evans (3) reconstruction are frequently employed.

Clinical Material
Twenty-three cases were studied. The indications for surgery were instability of the ankle with recurrent giving way and pain. All patients were assessed pre-operatively by the senior orthopaedic surgeon, and underwent stress varus x-rays under general anaesthesia. All patients had a documented history of previous ankle injury (or recurrent injuries). All had physiotherapy which had failed to relieve their symptoms prior to their operation.

The operations were carried out by either the senior orthopaedic surgeon or an orthopaedic specialist with the senior surgeon assisting.

The average operating time was 50 minutes, all patients had the same postoperative regime including plaster immobilization for 6 weeks followed by physiotherapy.

Operative Technique
The procedure was done under general anaesthetic and tourniquet control. A lateral incision was made over the distal third of the fibula curving around the lateral malleolus into upper lateral border of the talus.

The peroneus brevis tendon was divided as far proximally as possible from the muscle. The muscular part was sutured to the peroneus longus muscle.

The peroneus brevis tendon was dissected as far distally as the lateral malleolus. A tunnel was drilled transversely across the lateral malleolus through which the peroneus brevis was passed.

A second tunnel was drilled across the lateral aspect of the neck of the talus, and the peroneus tendon was passed through it and back on itself and sutured to the periosteum of the fibula.

The subcutaneous layer and skin were then closed and a well padded below knee plaster of paris was applied.

The sutures were removed at 10 days when a new synthetic plaster was applied. At six weeks the post-operatively plaster was removed and physiotherapy commenced.

Results
Patients were assessed for symptoms of pain, swelling, stiffness, difficulty in walking on uneven surfaces, giving way on running and whether or not patients returned to previous level of sporting activities, in particular contact sports such as football and rugby. Finally patients were asked about their expectations from their operation and their satisfaction with the results. The mean follow up was 15.5 months (Range 9-29 months).

Finally a grading was given combining the above parameters together with the clinical examination as described by Good, Jones and Livingstone (4) in 1975 as follows:

Grade 1 (Excellent) Full activities including return to previous occupation and contact sport. No pain or giving way.
Grade 2 (Good) Occasional ache after strenuous activities, but no giving way.
Grade 3 (Fair) Discomfort and apprehension walking over uneven ground.
Grade 4 (Poor) Giving way with pain walking over uneven ground.

Seventy percent of patients reported they were very satisfied with the results of their operation and that they would go through it again if they had similar symptoms in their other ankle. Ten percent of patients were satisfied with the results but would not go through it again.
Twenty percent of patients reported that the results of the surgery did not meet their expectations.

Eighty percent of patients reported having occasional ache in the ankle either at the end of the day or after strenuous sports. Fifteen percent reported recurrent sharp or severe pain enough to interfere with the activities. Only 5% had no aching or pain and felt that their ankle returned to normal.

Fifty percent of patients reported some swelling in their ankle at the end of the day or after strenuous activities, 30% had no swelling at all and 20% had swelling at all times.

Seventy percent of patients reported stiffness in the ankle early in the morning or at the end of a long working day, 20% had no stiffness, and 10% for stiffness in the ankle all day long.

Thirty percent of patients reported that they had no difficulties walking over rough ground, 30% had no difficulties but felt apprehensive, 30% reported occasional giving way, and 10% reported frequent giving way.

Only 50% of patients were able to return back to contact sports to the same level as before their injuries. With regard to maintaining basic army fitness requirements (BFT), 85% of patients were able to pass their BFT and were upgraded after their surgery to P2L2FE, 15% remained downgraded P3L3LE at their latest outpatient review.

One civilian in this series was not included in the above figures.

Stress inversion X-rays taken after the surgery were compared to the normal ankle joints in the same patients. This revealed average correction of talus tilt down to 2 degrees difference between the operated and normal ankles.

Discussion
Reviewing the British literature revealed only one previous study from a military hospital on reconstruction surgery using Evans technique for ankle instability in 24 patients in 1985, by Green (5), although it did not specify the number of civilian and military patients in the series.

In our series over 80% achieved good results and were able to pass a BFT test and were upgraded P2L2FE. There were frequent complaints of recurrent aching pain in the ankles as well as swelling particularly after strenuous activities, however this could be a reflection of the short follow up in this paper.

Watson-Jones procedure is effective in controlling both the AP Instability and Lateral Laxity, while Evans procedure corrected mainly lateral talar tilt. Young, Fowles, Fallaha, et al (6), reported that the long term results of both procedures were similar.

The small number in this series and the retrospective nature of this study makes it impossible to draw any firm conclusions but some observations were made.

Of the patients that were disappointed with the results, 4 patients had evidence of early degenerative changes of their ankles on the pre-operative X-rays which has not changed on subsequent follow up. This group of patients complained more of pain or aching in their ankles pre-operatively.

The post-operative stress varus x-rays in those patients revealed that their talus tilt was well corrected.

Van Der Rijt and Evans (7) reported in 1984 that long term instability of the ankle joint was associated with formation of marginal exostosis, the severity of which appeared proportional to the degree of instability.

One patient had no tilt of his talus on the stress post-operative X-rays, yet his ankle was still giving way frequently. He had marked weakness of his peronei muscles despite intensive physiotherapy.

The best results seem to be in those who were fit before the surgery and were able to pass BFT, and have undergone intensive physiotherapy prior and after the operation. The presence of osteoarthritic changes on the pre-operative x-rays is a poor prognostic sign.

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M Eskander and R Macdonald

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