

EVANS' REPAIR OF LATERAL INSTABILITY OF THE ANKLE JOINT

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A follow-up study is presented of 26 ankle joints with recurrent lateral instability, treated with surgical repair by the Evans method. The median follow-up period was 3.1 (range 1.1–6.9) years. Normal stability was achieved in 73 per cent of the ankles, and another 12 per cent were improved. Similar results are obtained with other methods of surgical repair. Preoperatively 82 per cent of the joints had a positive anterior drawer symptom. This was only found in 12 per cent postoperatively, and these ankles were all classified as having poor results, indicating the importance of reconstruction of the anterior talofibular ligament.

Key words: ankle injuries; ankle joint; ligaments, articular

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Recurrent lateral instability of the ankle is a well-known disability occurring especially in athletes and other active persons (Chrisman & Snook 1969), and is usually the result of inadequate treatment of a rupture of the lateral ligaments, the calcaneofibular and talofibular ligaments (Freeman 1965).

Several operative methods for repair of lateral ligamentous instability have been described. Among these, peroneus brevis tenodesis is one which is often used and various modifications have been described (Gallie 1913, Nilsson 1932, Evans 1953, Watson-Jones 1960, Chrisman & Snook 1969).

With the Watson-Jones method from 1940 (Watson-Jones 1960, Gillespie & Boucher 1971, Hedebo & Johannsen 1979) two different problems can be encountered: firstly, the tunnel in the neck of the talus may be difficult to drill and, secondly, the peroneus brevis tendon may be too short (Crenshaw 1971). The Evans method (Evans 1953) has been designed to overcome these difficulties and is technically more simple to perform. This paper presents the results of a follow-up study of patients treated for recurrent lat-

eral instability of the ankle joint by the Evans technique.

PATIENTS AND METHODS

During the period 1972–80, the Evans operation was performed on 29 ankle joints in 27 patients (13 males, 14 females) in the Department of Orthopaedic Surgery, Frederiksborg County Hospital, Hillerød.

The median age at operation was 28.7 range 15–76 years. The indication was in all cases frequent sprains after a relevant injury (3–34 months before the operation). All patients were hampered by the affected ankle in their daily activity (work and/or sport), and a clinical examination revealed an increased inversion tendency in all of the joints (compared with the non-injured ankle). Information regarding the anterior drawer test was only available in 17 cases, of which it was positive in 14. In 6 ankles conservative treatment with a plaster-of-Paris cast for 5–6 weeks had been tried.

The operative technique was according to Evans (1953): The peroneus brevis tendon was divided from the muscle as far proximally as possible and mobilized distally. The free end of the muscle was sutured to the peroneus longus tendon. A hole was drilled through the lateral malleolus from the tip of the fibula anteriorly emerging posteriorly about 3 cm proximal to the tip.

The tendon was then guided through the tunnel from the inferior aspect and sutured under tension to the adjacent soft tissues at both ends of the tunnel. Postoperatively the joint was immobilized in a plaster-of-Paris cast for 6 weeks, the first 3 weeks without weight-bearing.

Twenty-four patients (26 ankle joints) were seen at a follow-up examination performed by the author in 1980. This consisted of an interview, a physical examination and inversion-stress radiographs in the 17 cases where preoperative radiographs including inversion-stress exposures were available. The follow-up period ranged from 1.1 to 6.9 years, median 3.1 years.

Complaints were classified into four categories (Gillespie & Boucher 1971).

The *excellent* category contained patients with no complaints, and in whom the tendency to instability and sprains had disappeared.

The *good* category contained patients with minor complaints such as slight pain after long walks or a feeling of moderate stiffness in the ankle joint, but no tendency to sprains or instability.

The *fair* category contained patients, who complained of residual instability, although less compared to the preoperative condition.

The *poor* category contained patients who complained of unchanged persistent instability or stiffness with pain elicited even by minor weight-bearing.

The *physical examination* tested the mobility (extension/flexion, eversion and inversion) and included an anterior drawer test. The mobility was classified as increased, normal or reduced as compared with the normal ankle. In the two patients operated on both ankles, the anterior drawer test was considered as positive if a subluxation of 1 cm or more was found.

Radiography comprised normal anteroposterior views and inversion-stress exposures. The distance between the articular surfaces of the talus and tibia was measured at the prominence of the lateral eminence of the trochlea tali. If the normal distance at rest subtracted from the distance during forced inversion was 3 mm or more the joint was considered radiologically unstable (Ruth 1961, Hedebo & Johannsen 1979).

RESULTS

Complaints. Thirty-eight per cent (10/26) had no complaints and found the ankle stable. Thirty-five per cent (9/26) also found that the tendency to sprain the ankle and the instability had disappeared, but had minor complaints such as slight stiffness (4 ankles) and/or moderate pain after long walks (7 ankles). Twelve per cent found that the operation had improved the condition, but that some instability was present. In 15 per cent (4/26) the result of the operation was categorized

as poor. In 3 of these patients the frequency of sprains was unchanged, while the remaining patient complained of stiffness and severe pain after only short walks. The 4 patients in the latter group were female athletes under 30 years of age.

Physical findings. The clinical postoperative mobility of the ankle joints in different directions is listed in Table 1. The joints of the two bilaterally operated patients showed no obvious abnormalities and were classified as normal. Decreased extension/flexion and/or eversion was always accompanied by decreased inversion, which never was found together with a positive anterior drawer test. So mobility could be classified as reduced when decreased inversion was found and increased when a positive drawer symptom was found. In Table 2 the results of the clinical examinations are compared with the complaints. All the three ankles with increased mobility belonged to the poor category.

Table 1. Mobility of 26 ankle joints operated upon by the Evans method because of recurrent lateral instability

Direction of movement	No. of ankles with:		
	reduced mobility	normal mobility	increased mobility
extension/flexion	5	21	
eversion	2	24	
inversion	16	10	
"anterior drawer"		23	3

Table 2. Complaints compared with the physical findings at a follow-up study of 26 ankle joints treated for recurrent instability by the Evans method

Result	No. of ankles	Postoperative clinical mobility*		
		Increased	Normal	Reduced
Excellent	10		4	6
Good	9		2	7
Fair	3		1	2
Poor	4	3		1
Total	26	3	7	16

* Increased mobility: Positive anterior drawer symptom.

Reduced mobility: Decreased inversion (see text).

Table 3. The result of the Evans operation, subjectively and clinically compared with the pre- and postoperative radiographic findings

Result	No. of ankles	Postoperative clinical mobility			Radiological examination			
		Increased	Normal	Reduced	Preoperative Stable	Preoperative Unstable	Postoperative Stable	Postoperative Unstable
Excellent	5		2	3	3	2	5	
Good	7		1	6	5	2	7	
Fair	2		1	1	1	1	2	
Poor	3	3			3		2	1
Total	17	3	4	10	12	5	16	1

Radiography. The results of the radiological examination in 17 ankles compared with complaints and physical findings are listed in Table 3. Of the 14 ankles categorized as excellent, good or fair, 64 per cent (9/14) were preoperatively radiologically stable. Postoperatively they were all clinically and radiologically stable. The 3 ankles belonging to the poor category were radiologically stable preoperatively, while one was unstable postoperatively.

The effect of the operation can be measured by the opening of the tibiotalar joint (Gördes & Viernstein 1980). The median opening before the operation was 7.2 mm (range 4–13 mm) and postoperatively 5.1 mm (range 3–10 mm).

DISCUSSION

Chronic instability of the ankle joint with recurrent troublesome sprains should be treated by surgical repair (Cedell 1975). Direct suture of the anterior talofibular ligament even years after the original injury results in residual instability in 15 per cent (Broström 1966), while about 20 per cent of the patients, after surgical repair by the Watson-Jones method, complained of instability (Gillespie & Boucher 1971, Hedebo & Johannsen 1979).

The Evans method is technically easier to perform, but unlike the Watson-Jones method is not designed to reconstruct the anterior talofibular ligament, but only the calcaneofibular ligament (Crenshaw 1971). It seems that the Evans procedure stabilizes the ankle joint by decreasing the anterior subluxating tendency of the talus. In 82

per cent (14/17) of the ankle joints (where information was available) the anterior drawer test was positive preoperatively, while this was only found in 12 per cent (3/26) postoperatively. These latter ankles were all classified as poor by the patients, in agreement with the conclusions drawn by Broström (1966) about the importance of the anterior talofibular ligament in stabilizing the ankle joint.

Of the 26 operated ankles in this series 73 per cent (19/26) were functionally stable and 12 per cent (3/26) improved. This is comparable with the results of other methods and shows the applicability of the Evans method.

Inversion-stress radiographs only disclosed instability in 5 out of 17 preoperatively functionally unstable ankle joints. Postoperatively all but one were radiologically stable and the ankles with the anterior drawer symptom were not disclosed by this investigation. This confirms the negative opinions about the clinical value of inversion-stress radiography expressed, among others, by Rubin & Witten (1960). Instead the use of the more reliable anterior-drawer exposure (Cedell 1975, Gördes & Viernstein 1980) should be considered.

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