DISTAL TIBIOFIBULAR SYNOSTOSIS AFTER ANKLE FRACTURE
A 14-YEAR FOLLOW-UP STUDY

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Over an eight-year period up to 1983, a total of 322 consecutive patients had operations for ankle fractures; 176 were Weber type B and 128 type C. We were able to review 230 of these patients after a mean follow-up of six years (1 to 11) including 128 with Weber B and 102 with Weber C fractures.

We used an ankle score which combined symptoms and clinical and radiological findings, with a maximum score of 100 points. The mean score for all 230 was 92 (68 to 100). Fifteen of these patients had developed a distal synostosis between the tibia and fibula, three after a Weber B and 12 after a Weber C fracture. In 13 of these 15 ankles the synostosis had been visible radiologically within three months of the operation. In the other two there had been radiologically visible calcification at the three-month follow-up.

In 1993, we were able to review nine of the 15 patients with synostosis using the same scoring system. At a mean follow-up of 14 years (12 to 18) the mean score for those with synostosis was 91 (71 to 100), much the same as this group’s previous score and the mean score of the whole group of operated patients. We conclude that distal tibiofibular synostosis after ankle fracture usually causes few symptoms and does not generally require any treatment.

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Little has been reported about the incidence and effect of distal synostosis between the tibia and the fibula after ankle fracture, and most of the few series have only a short follow-up. As part of a general review of ankle fractures treated by operation, we report a long-term follow-up study of the incidence and timing of such synostoses and assess the functional and anatomical results.

PATIENTS AND METHODS
From 1975 to 1983, a total of 322 consecutive patients had operations on 322 ankle fractures at the Academic Medical Centre in Amsterdam. There were 176 Weber type-B and 146 Weber type-C fractures. We were able to review 128 patients with Weber B and 102 with Weber C fractures at a mean follow-up of six years (1 to 11). We found a distal tibiofibular synostosis in three ankles after a Weber B fracture and in 12 after a Weber C fracture. We have recently reviewed nine of these patients at a mean follow-up of 14 years (12 to 18).

We used an ankle score modified from that of Phillips et al (1985). This includes a subjective score for pain, stability, walking (including on uneven surfaces), walking distance, activity level and sport, swelling, and weather influences; these add to a maximum of 50 points. The objective score, also with a maximum of 50 points, includes range of motion of the ankle and subtalar joints, stability, synovitis, pressure pain, and radiological osteoarthritis of the ankle. This gives a maximum of 100 points for a normal ankle in a healthy person without complaints.

RESULTS
The 230 patients with Weber-B and Weber-C fractures had a mean score of 92 points (68 to 100) at a mean follow-up of six years (1 to 11). The 15 patients who had developed a distal tibiofibular synostosis had a very similar score, with no difference between the whole group and the synostosis group in range of motion, stability or radiological osteoarthritis of the ankle.

In 1993, we re-evaluated the 15 patients with synostosis. Three had died, and we were unable to trace another three. The nine who were studied in detail included six men and
three women, with a mean age of 56 years (46 to 88) after follow-up for a mean of 14 years (12 to 18). In 13 of the 15 patients the synostosis had already been present at their three-month follow-up and in the other two there had been clear evidence of calcification in the syndesmotic region at three months, with full fusion in the one-year films. There were no significant clinical or radiological changes in the ankle after the one-year follow-up (Fig. 1).

The mean ankle score of the nine long-term synostosis patients was 91 points (71 to 100) and the two worst scores (71 and 76) were in elderly patients with other musculoskeletal problems. One had severe osteoarthritis of the hips and knees, and the other had severe septic arthritis of the ankle six months after operation (Fig. 2). Neither of the low scores appeared to be due to the synostosis itself. In the seven other cases ankle dorsiflexion was equal to that on the contralateral side.

DISCUSSION

The scanty literature on distal tibiofibular synostosis includes descriptions of relatively few specific complaints (McMaster and Scranton 1975). Operative treatment has been considered only in young and active sportsmen and sportswomen (Whiteside, Reynolds and Ellsasser 1978; Flandry and Sanders 1987; Kottmeier, Hanks and Kalenak 1992). In theory, the complex biomechanics of the talus and the distal tibia and fibula suggest that a synostosis would reduce the range of motion of the ankle (Scranton, McMaster and Kelly 1976). It has been shown that the ankle mortice widens by about 1 mm during maximal dorsiflexion (Weinert, McMaster and Ferguson 1973; Seiler 1986) because the anterior articular part of the talar dome is wider than the posterior part. This would be expected to lead to either instability or to a decrease in dorsiflexion and early degenerative changes after tibiofibular synostosis. We found none of these changes.

The incidence of distal tibiofibular synostosis in our series was 2% after Weber B fractures and 12% after Weber C fractures, and therefore the condition was not rare. We found no correlation with the use of a syndesmotic screw, as compared with suture reconstruction of the syndesmosis, and the synostoses developed relatively quickly, usually within three months of the fracture.

We found no radiological change in the ankle after one year and no progression of degenerative changes. The synostosis patients had no significant complaints, and normal or near normal function and range of motion.

We conclude that distal tibiofibular synostosis after an ankle fracture usually gives rise to few symptoms and needs no specific treatment.

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REFERENCES


