Acta orthop. scand. 49, 211–214, 1978

ANKLE FRACTURES TREATED BY FIXATION OF THE MEDIAL MALLEOLUS ALONE

Late Results in 29 Patients

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A review of 29 patients with unstable ankle fractures treated by fixation of the medial malleolus alone is presented. At follow-up the result in 16 patients was classified as unsatisfactory or a failure and all of these patients showed radiological signs of posttraumatic arthrosis deformans. The importance of the position of the lateral malleolus in order to prevent joint incongruity and subsequent arthrosis is emphasized.

Key words: ankle fractures; arthrosis

Accepted 28.xi.77

Few problems in orthopaedic surgery have received more attention than the treatment of displaced fractures of the ankle. Opinions as to the treatment of choice diverge widely, ranging from closed reduction (Kristensen 1949, 1956, Watson-Jones 1955) to rigid, massive internal fixation of almost every fracture, as recommended by the A–O group (Willenegger & Weber 1963, Weber 1966). For many years the position of the medial malleolus was considered a cardinal point and several authors have recommended operative reduction and fixation of the medial malleolus combined with closed reduction of the lateral malleolus (Müller 1945, McLaughlin & Ryder 1949). In cases with a posterior tibial fragment which comprised more than one quarter of the joint surface it was recommended that this be fixed separately. Until recently we have followed this principle and this paper presents the late results in 29 patients.

PATIENTS AND METHODS

In the 5-year period from 1969 to 1974, a total of 231 patients with displaced malleolar fractures were treated in our hospital. 126 patients were treated by closed reduction and 105 by operation. Forty-three patients had only one fractured malleolus, while the remaining 62 patients were suffering from bi- or trimalleolar fractures. Of these 62 patients, 29 had only a posterior tibial fragment fixed, and the material thus comprises 33 patients treated with screw fixation of the medial malleolus and closed reduction of the lateral malleolus.

In four cases a posterior tibial fragment of more than one quarter of the joint surface was fixed separately. At follow-up two patients had died, which left 31 patients. Two patients were unavailable so 29 patients were reviewed (94 per cent). The patients were asked to fill in a questionnaire concerning subjective symptoms, working ability and restrictions in sport. All patients were examined clinically and X-rays of the ankle were taken. The material consisted of 19 males and 10 females and the age distribution is shown in Figure 1. Only patients over 15 years of

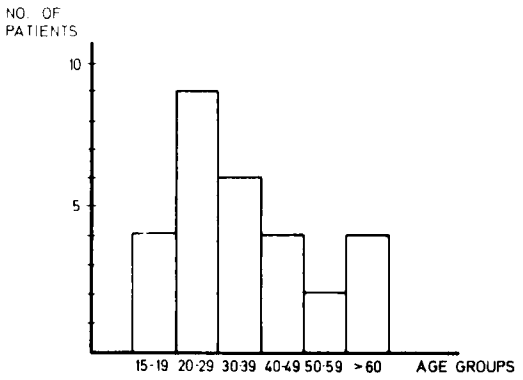

Figure 1. Age distribution of 29 patients with displaced fractures of the ankle.

age were included, and the mean observation time was 4.8 years.

The material was obtained retrospectively.

RESULTS

The classification of the fractures was made according to Lauge Hansen (1942) and is shown in Table 1. The result was classified as follows:

Excellent: No pain, no swelling, full or only negligible restriction of motion.
Satisfactory: Occasional pain and/or swelling after extra exertion, slight stiffness, no reduced capacity for work.
Unsatisfactory: Pain on motion, swelling, reduced capacity for work necessitating a change to light work, considerable stiffness.
Failure: Unable to work, daily pain, severe stiffness.

The overall results are shown in Table 2. More than half the results were either unsatisfactory or failures.

The degree of posttraumatic arthrosis was determined radiographically as follows:

Slight arthrosis: Slight reduction of the joint space and slight formation of deposits on the joint margins.
Moderate arthrosis: Joint space reduced up to 50 per cent, sclerotic configuration within the subchondral osseous tissue of the tibia. Moderate formation of deposits.
Severe arthrosis: Joint space virtually nonexistent. Severe formation of deposits.

The degree of arthrosis is shown in Table 3. All patients demonstrated some signs of arthrosis, in the mild cases localized in the lateral part of the ankle joint. The relationship between the degree of arthrosis and the result is shown in Table 4. It will be seen that even a severe degree of arthrosis does not preclude a satisfactory result.

The result as related to the age of the patient is demonstrated in Table 5. Seven out of eight failures were patients under 30 years of age, while the excellent results were obtained in the older age groups, signifying perhaps that the handicap is greater in younger, more active persons.

DISCUSSION

The objective of the treatment of malleolar fractures is to achieve an anatomically satisfactory joint reconstruction as an

Table 1. Classification of 29 ankle fractures according to Lauge Hansen (1942).

SUPINATION–OUTWARD ROTATION STAGE IV	:	21
PRONATION–OUTWARD ROTATION STAGE III–IV	:	6
SUPINATION STAGE II		2
TOTAL	:	29

Table 2. Overall late results in 29 patients.

EXCELLENT	:	3	13
SATISFACTORY	:	10	
UNSATISFACTORY	:	8	16
FAILURE	:	8	

Table 3. Degree of posttraumatic arthrosis deformans in 29 patients.

SLIGHT ARTHROSIS	:	14
MODERATE ARTHROSIS	:	8
SEVERE ARTHROSIS	:	7
TOTAL	:	29

Table 4. The relation between late results and degree of arthrosis in 29 patients.

SLIGHT ARTHROSIS, 14 PATIENTS		
EXCELLENT	:	3
SATISFACTORY	:	2
UNSATISFACTORY	:	5
FAILURE	:	4
MODERATE ARTHROSIS, 8 PATIENTS		
EXCELLENT	:	0
SATISFACTORY	:	5
UNSATISFACTORY	:	1
FAILURE	:	2
SEVERE ARTHROSIS, 7 PATIENTS		
EXCELLENT	:	0
SATISFACTORY	:	3
UNSATISFACTORY	:	2
FAILURE	:	2

Table 5. Mean age of the patients in relation to the late result.

EXCELLENT	: MEAN AGE 43
SATISFACTORY	: MEAN AGE 32
UNSATISFACTORY	: MEAN AGE 32
FAILURE	: MEAN AGE 23

essential basis for optimal joint function and prevention of the development of arthrosis deformans (Cedell 1975). Many authors have shown that joint incongruity leads to arthrosis (Lewis & Graham 1940, Palmer 1941, 1944). Conservative treatment involving reduction and fixation in plaster is recommended by many surgeons (Kristensen 1949, 1956, Watson-Jones 1955, Kleiger 1961). They resort to operative treatment only in cases in which repeated attempts at reduction do not result in acceptable fracture position.

Others believe that fixation of the displaced medial malleolus and of a large posterior tibial fragment with subsequent reduction of the lateral malleolus is indicated (Müller 1945, McLaughlin & Ryder 1949).

However, many authors have pointed out that non-operative reduction of the lateral malleolus seldom results in an anatomically satisfactory joint reconstruction due to interposition of ligaments, cartilage, and bone fragments (Palmer 1950, Burwell & Charnley 1965, Weber 1966, Cedell 1967).

Breitenfelder (1957) and Willenegger (1961) have shown that widening of the ankle mortise due to even minute rotation and lateral displacement of the lateral malleolus results in a diminished contact area between the tibia and the talus. Lateral subluxation of the talus means that the exact fit between the articular ridge of the tibia and the corresponding articular groove of the talus is disturbed leading to incongruity and arthrosis (Cedell 1975). In all our patients the lateral malleolar fracture healed in a position with varying degree of outward rotation, lateral,

proximal, and dorsal displacement, and they all showed signs of arthrosis deformans.

The question is now whether operative treatment aiming at reconstructing all components of the ankle joint is superior to more conservative measures. Comparing Magnusson's conservatively treated material (1944) to his own treated by operation, Cedell (1967) found a reduction of the frequency of arthrosis deformans in supination-outward rotation injuries stage IV from 82 to 38 per cent. In the present series, comparable as regards age and sex of the patients, using the same classification of the fractures, a frequency of 100 per cent was noted.

The result in 16 out of 29 patients was classified as either unsatisfactory or a failure, but as the development of arthrosis deformans is a rather slow process (Hendelberg 1943), the mean observation time of 4.8 years makes a further reduction of the number of good results probable. The connection between arthrosis deformans and subjective symptoms has been discussed for many years. A mild degree of arthrosis is not necessarily accompanied by subjective symptoms (Magnusson 1944, Klossner 1962), but marked arthrosis nearly always involves severe subjective symptoms (Hendelberg 1943, Willenegger 1961, Klossner 1962).

This paper supports the view that exact reposition of the lateral malleolus is essential for good joint function and the prevention of the development of posttraumatic arthrosis deformans. It also shows that this position cannot be achieved by conservative measures, and we therefore recommend operative fixation of unstable malleolar fractures.

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