THE MANAGEMENT OF TIBIAL FRACTURES IN ALCOHOLICS AND MENTALLY DISTURBED PATIENTS

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Several authors in Sweden have recently shown that high grade alcoholics are a burden on hospital and casualty departments (Johnsén, Linder and Lorentzsson 1966; Allgulander, Lundman and Myrhed 1971; Bjerver, Goldberg and Rydberg 1971; Lundström 1972). Because such patients lack insight, the course of their illnesses may be influenced adversely. The union of a tibial fracture takes a relatively long time, during which the patient's cooperation is required, especially when internal fixation is used without a plaster cast. It is therefore to be expected that the course of this particular injury will be influenced to some extent by a disturbed personality.

This article draws attention to the increased incidence of complications suffered by alcoholics and psychologically abnormal patients in a series of tibial fractures treated by internal fixation. To the experienced surgeon this is quite well known, but so far we have not found the problem analysed.

MATERIAL

From 1965 to 1969, 129 patients were treated in the University Hospital, Uppsala, by compression fixation of the tibia following the AO technique (Olerud and Karlström 1972). All the case notes were examined and all complications in the course of healing were noted. It was possible to follow up 118 of these patients. Of the other eleven, eight had died and three could not be traced. Alcoholism and other changes of personality were noted, partly from the case notes and partly on later examination of the patients. The alcoholics were often already known to the hospital when they were admitted with their fractures, but in certain cases the abuse became apparent only during convalescence. Other forms of psychological deviation were noted, such as manifest psychosis requiring admission to a psychiatric ward, epilepsy, serious criminal conduct with repeated imprisonment, and in some patients, strange behaviour with almost total inability to follow instructions during treatment, shown for example by absconding from the hospital. The severe complications of healing included deep infection, bending or breaking of the plate, refracture and new fracture, extensive skin necrosis and delayed union.

RESULTS

Of the 129 patients, twenty patients (15 per cent) had problems of the kind already mentioned and were divided in two groups—those with complications and those without. In the first group (Table I) not one was really an institutional patient after leaving the surgical ward. In the second group (Table II) two-thirds were taken care of in an institution of some kind. In the whole series twenty-five patients developed the more serious complications listed above (Olerud and Karlström 1972), and of these, eleven were alcoholics or had other psychological abnormalities (Tables I and III). The incidence of graver complications in such patients was 55 per cent, while in the rest of the patients it was only 12 per cent (Table IV).

Because healing time in the conventional sense—the time to reach stability of the fracture and final removal of plaster—cannot be used for fractures treated by internal fixation and functional after-treatment, the time till full weight-bearing was resumed and the time off work were taken instead. The disturbed group was markedly different from the normal group in these respects, with twice as long recovery times (Table V).

TABLE I
DETAILS OF ELEVEN DISTURBED PATIENTS WITH COMPLICATIONS DELAYING HEALING

Case number	Age at operation (years)	Psychological defect or abnormal behaviour	Admitted to mental hospital or institution during convalescence	Complication	Number of secondary operations	End-result
1	50	Absconded from hospital. Weight-bearing after 2 weeks. No control over this patient	No	Refracture	1	Good
2	46	Chronic alcoholism	No	Infection	2	Good
3	40	Chronic alcoholism. Weight-bearing too early	No	Infection	1	Good
4	48	Chronic alcoholism. Weight-bearing too early	No	Two refractures, the first caused by injury	2	Excellent
5	37	Chronic alcoholism. Weight-bearing too early	No	Broken plate	1	Good
6	54	Chronic alcoholism. Weight-bearing too early. No control over this patient	No	Infection and pseudarthrosis	2	Acceptable
7	23	Chronic alcoholism. Weight-bearing too early	No	Refracture	1	Excellent
8	19	Alcoholic. Criminal. Weight-bearing too early. No control over this patient	No	Refracture	1	Excellent
9	17	"Problem child." Weight-bearing too early	No	Pseudarthrosis	3	Good
10	27	Alcoholic. Weight-bearing too early	No	Refracture	None (only stopped weight-bearing)	Excellent
11	31	Chronic alcoholic. Weight-bearing too early	No	Pseudarthrosis	1	Excellent

DISCUSSION

The clearly increased incidence of severe complications in these disturbed persons after their operative treatment has undoubtedly several causes. Firstly, they are often lacking in judgment, which means that they pay very little attention to instructions, thus increasing the risk of infection and refracture; they are also particularly liable to suffer further trauma. Secondly, some patients continue to take alcohol, and possibly drugs, during treatment. Intoxication from either cause increases the risk of further accidents, impairs judgment even more, and further decreases or even removes the pain inhibition which makes a normal patient more careful. In advanced alcoholism neuropathy may have some importance in this respect. Thirdly, chronic alcoholics are more often undernourished and osteoporotic than the normal population (Saville 1965), which means, for example, a greater risk of fracture of the neck of the femur (Nilsson 1970). Osteoporotic bone is a poor foundation from which to repair a fracture.

It was obvious in this series that most complications arose in alcoholics who bore weight too early (Table I), but given after-care in an institution or mental hospital, the risk would seem to be significantly less (Table II). Consequently the treatment of tibial fractures, particularly by plating, should be modified in these patients.

TABLE II
DETAILS OF NINE DISTURBED PATIENTS WITHOUT DELAYS IN HEALING

Case number	Age at operation (years)	Psychological defect or abnormal behaviour	Admitted to mental hospital or institution during convalescence	Special precautions	End-result	Remarks
12	30	Criminal psychopath	Yes	None	Good	
13	47	Chronic alcoholic	No	None	Excellent	
14	38	Chronic alcoholic	No	None	Excellent	
15	52	Chronic alcoholic	No	Plaster casts	Excellent	
16	24	Chronic alcoholic	Yes	None	Not known	Not examined afterwards. Disappeared
17	39	Epileptic psychosis	Yes	Plaster	Not known	Not examined afterwards. Died of a urological condition
18	71	Paranoid psychosis	Yes	Plaster casts	Excellent	
19	36	Schizophrenia	Yes	None	Good	
20	53	Oligophrenia	Yes	Plate placed on lateral side of tibia	Excellent	A lateral plate acts as a tension plate and gives greater stability

TABLE III
A BREAK-DOWN OF THE SERIES

Patients with delayed healing, 25; number "disturbed", 11 (44 per cent)
Total number of patients, 129; number "disturbed", 20 (15 per cent)

TABLE IV
ANOTHER BREAK-DOWN OF THE SERIES

"Disturbed" patients, 20; with delayed healing, 11 (55 per cent)
"Normal" patients, 109; with delayed healing, 14 (12 per cent)

TABLE V
AVERAGE TIMES FOR RECOVERY

Type of patient	Time till full weight-bearing (months)	Time off work (months)
"Disturbed"	10·4	14·2
"Normal"	4·7	7·1

First of all, the indications for operative treatment must be sharply defined. In some cases conservative treatment is certainly to be preferred, but completely to deny these patients the advantages which stable internal fixation gives in the way of a favourable end-result (Hicks 1971) cannot be right. It is our experience that even treatment by plaster casts in these patients can be hazardous because the plaster so often crumbles. Treatment by plaster alone also tends to be prolonged in these patients, which increases the risk of permanent joint stiffness (Hicks 1969). If the fracture is closed and transverse, intramedullary nailing with a thick nail is preferable to plating, because it makes for easier post-operative treatment (Rehn and Hierholzer 1965).

FIG. 1

Case 4—A cautionary series of radiographs of the right tibia of a woman aged 48, an alcoholic. *a*) A film taken in March 1967, showing a short oblique closed fracture with a fissure extending distally to the metaphysis. *b*) After the insertion of three screws and an eight-hole compression plate. This was successful, and extraction of the plate and screws was planned for the autumn of 1969. *c*) Showing an open comminuted fracture sustained when the patient, inebriated, fell over in August 1969. *d*) Showing further fixation with a twelve-hole compression plate. The patient continued to drink heavily, with premature weight-bearing in consequence. *e*) A film taken in March 1970, showing the plate broken and the tibia refractured. *f*) A film taken after removal of the broken plate and screws, reaming out of the medullary cavity and insertion of a stout intramedullary nail. And (*g*) a film taken a year later, showing consolidation four years after the initial fracture. The patient has since been admitted to a clinic for alcoholics.

If compression-fixation is to be performed by plating, and one has to reckon with the patient not following instructions during the healing period, both the patient and the plate can be protected in several ways. In certain cases a period of hospitalisation is indicated. Again, the montage can be protected by the use of plaster.

A standard plaster cast can of course be applied directly after plating, renewed as necessary, and retained until the fracture is certainly stable under weight-bearing. But this sequence hinders functional mobilisation, which is the great advantage of stable internal fixation. A useful alternative is the intermittent use of plaster casts, even with weight-bearing permitted. With this

routine the patient receives physiotherapy for some days after the operation, so that joint function is largely restored. A cast is then applied, preferably of the patellar-tendon-bearing type. After four to six weeks the patient is freed of plaster for one to two weeks, during which time he is encouraged to work hard at regaining mobility of the joints. Serial plaster casts are used in this way until the fracture has soundly united. It is often best to admit the patient to hospital for the free periods. If plate fixation has been chosen for disturbed patients, it is possible by paying them special attention along these lines to avoid for the most part the serious complications such as those suffered by the patient referred to in Figure 1.

The open reduction of a tibial fracture, especially with compression-plate fixation and early mobilisation, throws a great responsibility upon the surgeon. If the treatment is to be successful, the patient must be able to accept his share of the responsibility during the post-operative treatment. In other words, the patient should have a personality suitable for this specially advantageous technique.

SUMMARY

1. In a series of 129 tibial fractures treated by compression plates, a high incidence of complications causing delay in healing was found in alcoholics and persons with abnormal personality traits.
2. The healing time and time off work for these people were about doubled.
3. The indications for internal fixation in such patients should therefore be sharply defined and, if used, added protection should be given by institutional care and by well controlled plaster casts.

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