

TREATMENT OF PATHOLOGICAL FRACTURES

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The treatment of 30 patients with 34 pathological fractures is reported. Twenty-six femoral fractures and one ulnar fracture were fixed internally, whereas five fractures of the humerus, one of the radius, and one of the clavicle were treated non-operatively. Twenty-two of the patients were discharged from hospital (21 were mobilized) and eight died in the postoperative period. All patients became free of pain, and bony union occurred in 12 of the fractures. Thirteen per cent of the patients lived less than 1 month whereas 20 per cent lived more than 24 months after fracture. Previously published figures and our results indicate the place of prophylactic nailing of certain femoral metastases, perhaps also in connection with local irradiation of the metastases.

Key words: fractures, internal fixation; fractures, internal fixation, intramedullary; pathological fractures; prophylactic fixation of pathological fractures

Accepted 24.iv.79

The number of patients with pathological fractures attending orthopaedic surgical departments can be expected to increase. Moreover, there is presumably now a longer survival time after treatment for pathological fractures. In order to promote healing of the fractures, to relieve the patients of their pain, and to mobilize them, we have used operative treatment or plaster bandage followed by rehabilitation and early discharge. The object of this paper has been to analyse the results of this intensive treatment.

PATIENTS AND METHODS

From 1971 to 1975, 30 patients with pathological fractures have been treated in the Department of Orthopaedic Surgery at Gentofte Hospital. There were 19 women and 11 men, and the age range was from 38 to 90 years with a median of 69 years. The 30 patients were treated for a total of 34 fractures. There were 26 fractures of the femur, five fractures of the humerus, one of the radius, one of the ulna, and one of the clavicle.

The fractures of the lower extremities were treated with a McLaughlin nail, Jewett nail, Moore prosthesis, sliding nail, or AO intramedullary nailing. The ulnar fracture was treated with a medullary screw whilst the remaining fractures of the upper extremities were immobilized in plaster. The fracture of the clavicle was treated with the three-slings method.

The type of primary tumour and the number and localization of the fractures are listed in Table 1. The primary diseases had started from 0 to 24 years prior to the fracture. In three patients the fracture was the first symptom.

Four patients had received local radiation therapy for metastases before the fracture. Two of these patients received radiation for femur metastases from a mammary cancer and sustained the fractures 2 and 4 years after irradiation. One patient with a squamous cell carcinoma of the lung received supervoltage radiation for metastases to his left femur and suffered a left pertrochanteric fracture within 1 month after the treatment had started, and one patient with a mammary cancer and metastasis to the humerus had X-ray therapy and fractured the humerus within the following month.

In our material four patients received radiation in connection with the osteosynthesis. One patient with renal cancer was given cobalt radiation for

Table 1. The sites of primary origin and the number and localization of the fractures

Primary tumour	Number	Fracture	Number
Carcinoma of breast	14a)	Femur	13
		Humerus	2
Carcinoma of lung	5b)	Femur	6
Multiple myelomatosis	4c)	Femur	3
		Humerus	1
		Clavicle	1
		Ulna	1
Carcinoma of prostate	3	Femur	2
		Humerus	1
Carcinoma of kidney	2	Femur	1
		Radius	1
Carcinoma of thyroid	1	Humerus	1
Carcinoma of bladder	1	Femur	1

a) One patient with one fracture of the femur and one of the humerus

b) One patient with two fractures of the femur

c) One patient with two fractures of the femur and one of the humerus

his femoral fracture. One patient with mammary cancer re-fractured her femur on the 7th postoperative day while still having X-ray therapy. One patient with a femoral fracture received local X-rays. The primary tumour had not been located at the time, but post-mortem section showed a bronchogenous cancer. One patient with multiple myelomatosis sustained a fracture of the olecranon which was irradiated with X-rays before osteosynthesis.

There were no prophylactic nailings in our material.

RESULTS

At the postoperative radiographic examination, it was seen that satisfactory reduction and fixation had been obtained in 26 of the 34 fractures. One McLaughlin nail had bent and one AO intramedullary nail had perforated the femur, but both fractures healed nevertheless. One humerus treated with a plaster bandage developed an angulation and one femur treated with an AO intramedullary nail showed a gap in the fracture. Neither of these fractures healed. The remaining four fractures showed increasing osteolytic activity and

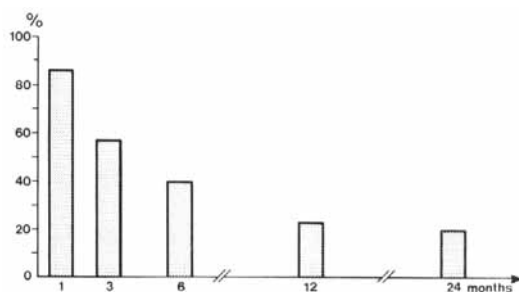


Figure 1. Survival periods after fracture.

were re-operated from 4 days to 6 months later. One of these patients died within 1 week and one of the fractures healed.

Twelve of the 34 fractures (35 per cent) showed bony union in radiograms taken 1 month to 1 year postoperatively.

Twenty-one of the patients were walking either with or without crutches. One patient was discharged in a wheelchair and eight patients died from their primary disease before mobilization.

All patients became free of pain after fixation of their fractures.

The survival periods after fracture are listed in Figure 1.

DISCUSSION

Active and prompt treatment of pathological fractures is justified. In the present series, all patients were relieved of pain immediately after fixation. As a consequence of the fracture treatment it becomes easier to mobilize the patients. The length of the hospital stay is reduced and for those patients who cannot be mobilized because of their primary disease nursing care is made easier.

In our material there were no prophylactic osteosyntheses, but some authors recommend prophylactic osteosynthesis for all impending pathological fractures (Altman 1953, Bremner & Jelliffe 1958, Johnson 1957, and Katzner et al. 1974), whereas others only recommend treatment in the case of femur metastases (Beals et al. 1971, Bennish & Hammond 1955,

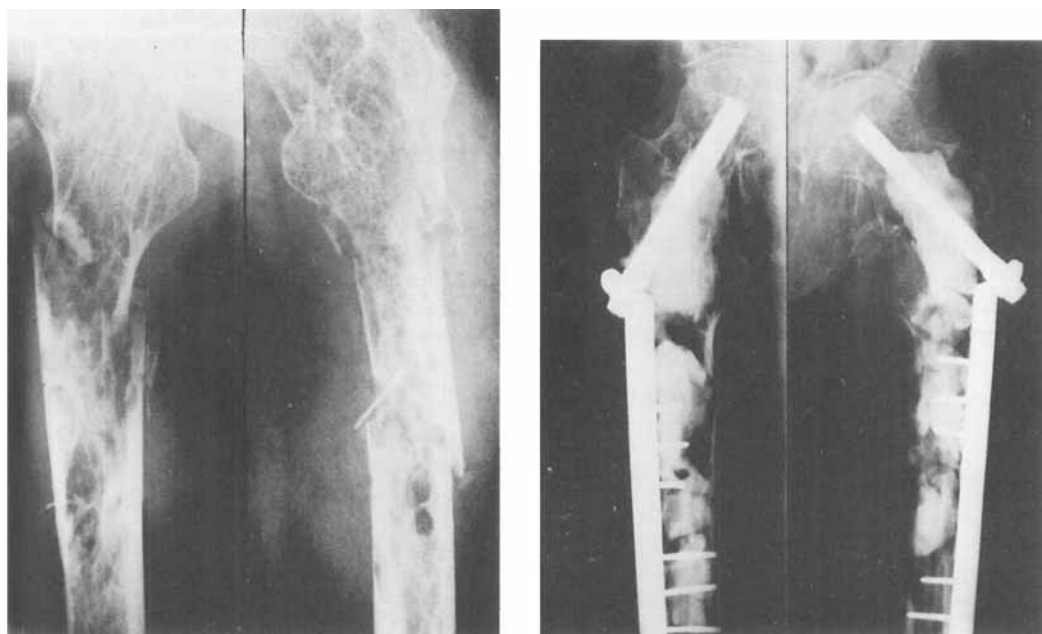


Figure 2. Bilateral pathological fractures in the femurs of a patient with multiple myelomatosis, before and after osteosynthesis.

and Ehrenhaft & Tidrick 1949). Thus, Beals et al. (1971) reduced the incidence of pathological femoral fractures, in a series of patients with mammary cancer, from 32 to 9 per cent by means of internal fixation. The figures collected by Fitts et al. (1953) show that mammary cancer frequently metastasizes to bones and frequently causes fractures, particularly of the femur. This is in accordance with the findings in our material where 14 patients with cancer of the breast had 13 femoral fractures. This high incidence could support the concept of prophylactic nailing of certain femur metastases. Moreover, the four patients in our material, who received local irradiation prior to the fractures, three of which were in the femur, may also have benefited from prophylactic fixation.

Postoperative local irradiation has been recommended as a routine by Bremner & Jelliffe (1958) and Fitts et al. (1953), but the latter, however, mentions primary gastrointestinal tumours as an exception. The four

patients in our material who received radiation in connection with the osteosynthesis constitute too small a group for an evaluation to be made of this regimen.

The survival times after fracture as shown in Figure 1 do not differ from those found by Bremner & Jelliffe (1958), Fitts et al. (1953), and Koskinen & Nieminen (1973).

Bony union occurred in 35 per cent of our cases whereas Fitts et al. (1953) found that 22 per cent healed and Koskinen & Nieminen (1973) reported 7 out of 50 patients with bony union. Bremner & Jelliffe (1958), on the other hand, observed healing in 24 out of 36 patients (67 per cent), which may be due to the fact that all patients in their material were irradiated after operation.

Theoretically there is a risk of spreading the tumour cells by intramedullary nailing of a metastatic fracture. This has been experimentally demonstrated by Peltier (1951). Considering that these patients already at operation have widespread malignant disease [Bremner & Jelliffe (1958)

demonstrated other bony metastases in 67.5 per cent of their operated patients] and considering the palliative nature of the operation, it seems reasonable to take this presumably slight risk.

Thus, we may conclude that pathological fractures in general should be treated with internal fixation and that metastases to the femur, in selected cases, possibly should be treated by prophylactic nailing. The value of local irradiation therapy for bony metastases before, as well as after, osteosynthesis is unclarified, though it may promote bony union.

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