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SHORTENING IN PSEUDARTHROSIS. TREATMENT WITH THE KÜNTSCHER DISTRACTOR

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Shortening in pseudarthrosis may be due to loss of substance by resorption, displacement of fragments, or more often a combination of both.

The problem deserves consideration in the planning of treatment and the aim should be to leave the patient with as little shortening as possible. In many cases it is impossible to correct the shortening at the time of operation, and it would seem necessary to make a resection in order to accomplish reduction of the fragments. However, this means of treatment neglects the shortening and should not be recommended, at any rate not as far as the lower extremity is concerned.

Preoperative traction of conventional type is insufficient. The weight which is needed could not practically be applied, even by lowering the upper end of the bed.

Pseudarthroses may, of course, be very mobile, but then shortening is often considerable, and the last part of the elongation process takes as much force as in firm pseudarthroses.

The ideal would be elimination of the shortening preoperatively, so that apposition of the bone ends is the only reduction needed at operation.

A reasonable period of time must be allowed for the soft tissue structures to adapt themselves to the changes of tension that follow. We have been using the Küntscher distractor in the preoperative treatment of some cases of pseudarthrosis with shortening. The principle will be understood from Figure 1. Kirschner wires proximal and distal to the pseudarthrosis are the puncta fixa, which are connected by the apparatus, and traction is accomplished by screwing the Kirschner wires apart. In the case of a femur the wires are put through the spina iliaca ant. sup. and the distal femur. In the tibia they are put through the proximal and the distal part of the bone. (The calcaneus has been

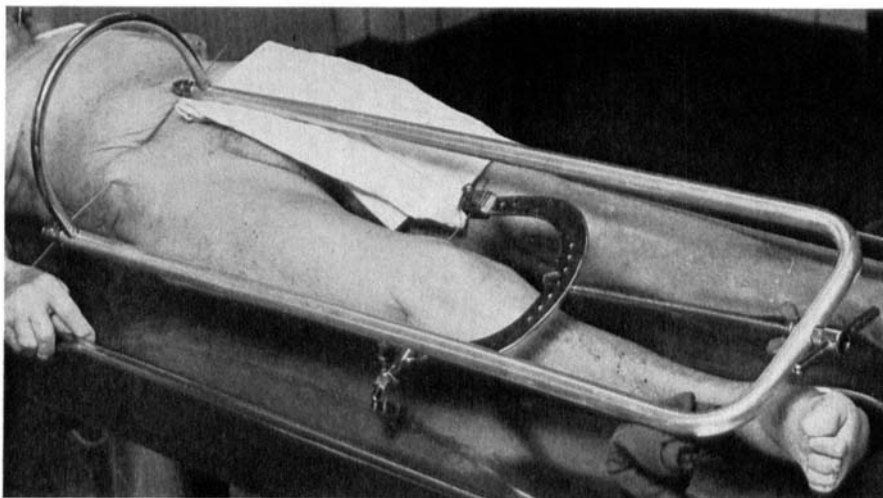


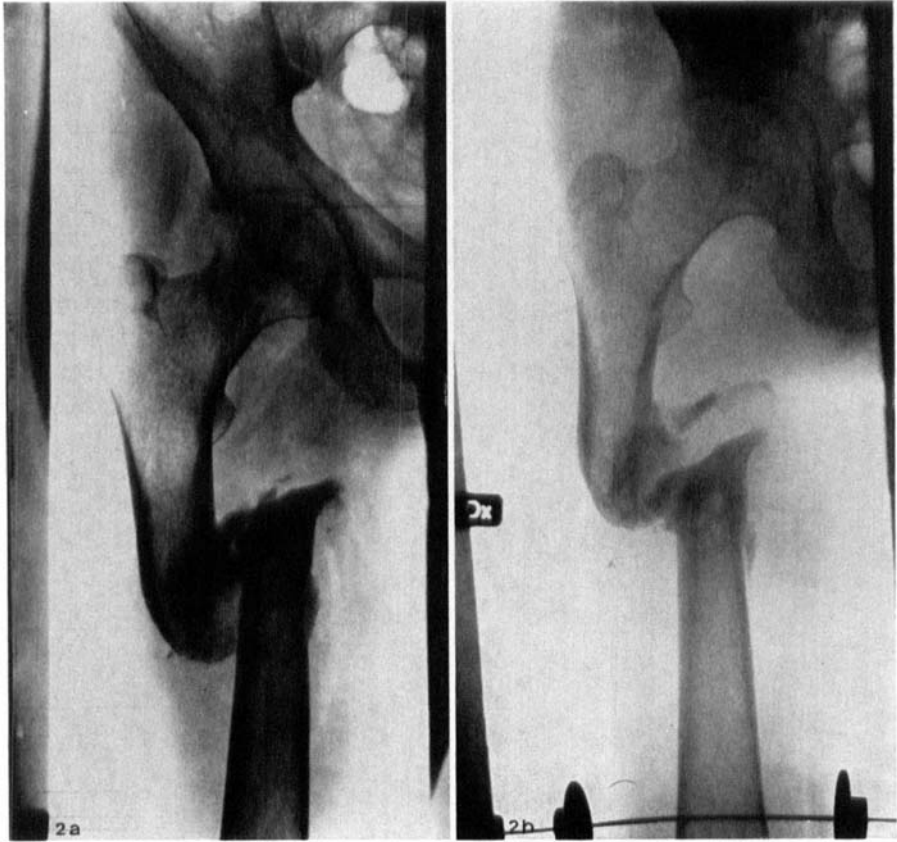
Figure 1. Distractor applied for traction on the femur.

suggested, but it seems unnecessary to submit the ligamentous structures of the ankle joint to this very strong traction.) At the same time a fibulotomy must be done. The fibula has generally healed.

The screwing of the distractor is done at a rate of 1–2 mm a day. Moderate pain is often experienced by the patient, but disappears after a while.

By this procedure it is possible to break up even very firm pseudarthroses. We have seen no unfavourable reactions from the muscles, the vessels, or the nerves. A mild infection at the spina has been observed, but it subsided quickly after removal of the distractor. The spina is actually rather fragile as an anchoring point. We have seen cutting through by the Kirschner wire here after weeks of traction, but it has been possible to apply the distractor again if necessary and to continue the treatment. A special metal cylinder, threaded over the Kirschner wire, has been recommended to prevent this complication.

After distractor treatment, rigid fixation is extremely important. The mechanical demands on osteosynthetic material and its fixation to the bone are great. It is an advantage therefore if the pseudarthrosis allows fixation with a heavy Küntscher nail. This method generally gives a reliable stability and makes early mobilization possible. Additional measures such as bone grafting will only be necessary in exceptional cases, and resection of "bad" pseudarthrosis tissue should not be done. The sclerotic masses have a potential healing capacity which has



31 May 1966

3 June 1966

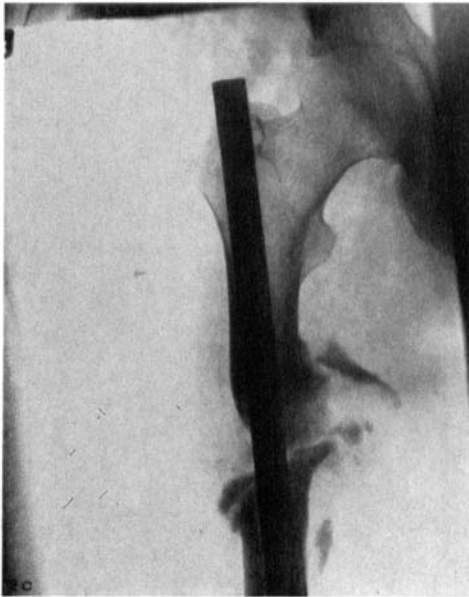
Figure 2.

often been underestimated. The reaming, which always precedes nailing, might be of importance in promoting healing.

Two case histories illustrate the effect of the treatment:

Case 1. (See Figure 2). 35-year-old man with a very mobile pseudarthrosis of his right femur after a fracture when he was 20. The fracture was treated primarily by Lane plate and cerclage. Infection followed and a fistula was discharging for many months. The metal was removed. The fracture did not heal, and an increasing shortening followed, finally a total of about 10 cm. The right knee was practically stiff. In 1965 there was a flare-up of the infection. The patient was seen by us in 1966. The infection was then quiet.

After 6 weeks of distractor treatment a Küntscher nailing was performed. A new flare-up of the infection followed in spite of prophylactic treatment with cloxa-



15 July 1966



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4 April 1968

Figure 2.

cillin. Drainage brought the infection under control, but a fistula persisted. Weight-bearing was allowed after a few days. The pseudarthrosis healed. Only after extraction of the nail could the infection be treated effectively and has not recurred (1½ years). 5 cm shortening remained because of defect.

Case 2. (See Figure 3). 22-year-old man, who had a fracture of the right tibia and fibula in a traffic accident 1965. He was treated conservatively with traction and plaster. The fibula healed, the tibia did not. He had been walking all the same, and an increasing shortening and varus deformity followed. In April 1968, after a fibulotomy, the distractor was applied. After one month of traction Küntscher nailing was performed. Weight-bearing was allowed early. The pseudarthrosis healed.

The distractor is delivered by Firma Waldemar Link, Steilshooper strasse 155, Hamburg 33.



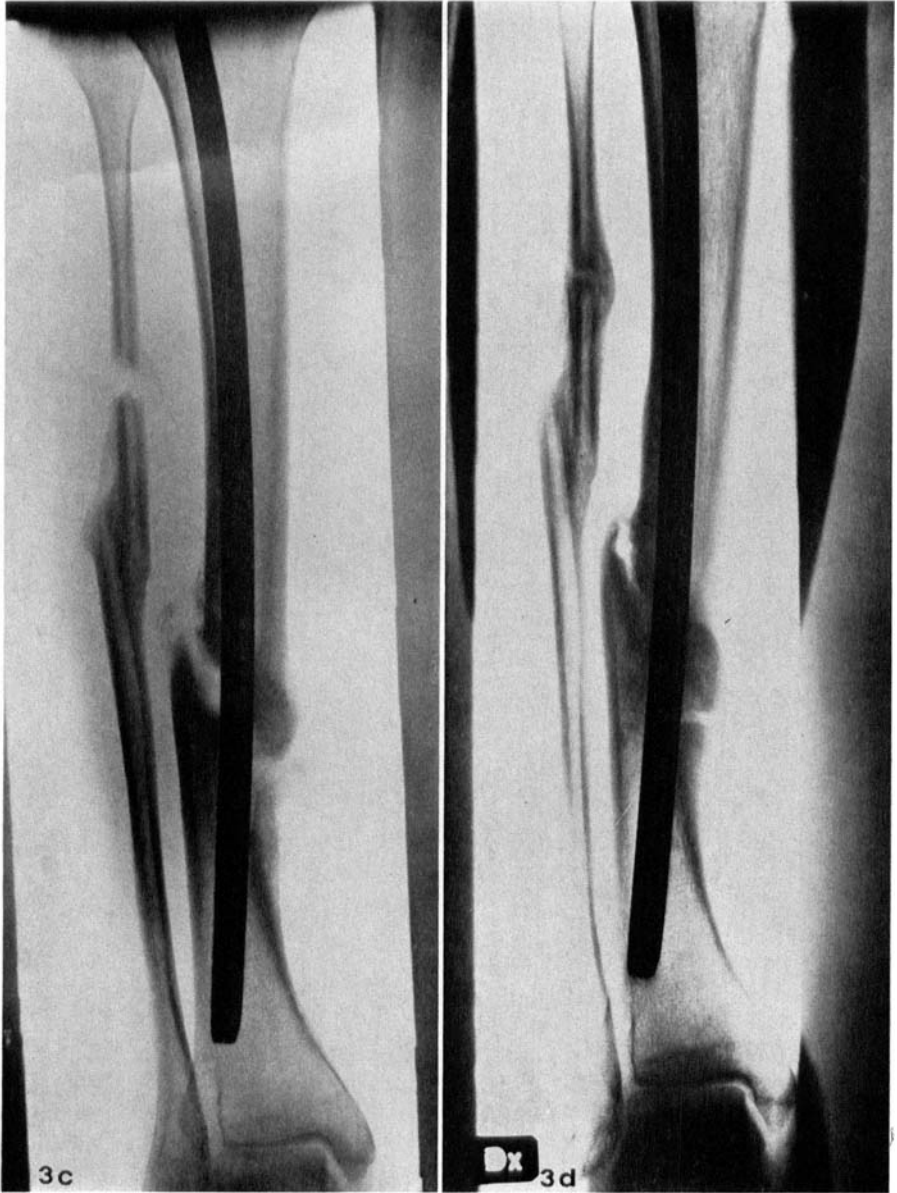
17 April 1968

6 May 1968

Figure 3.

SUMMARY

The effect of the Küntscher distractor is illustrated by two cases with shortening of the femur and the tibia because of pseudarthrosis.



17 May 1968

13 January 1969

Figure 3.