A CASE OF BILATERAL SUPRACONDYLAR FRACTURE OF THE FEMUR

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SUPRACONDYLAR fracture of the femur is not an uncommon injury in Service personnel. This is due to the high incidence of road traffic accidents. The "Champ" is often the vehicle involved. The injury is caused by a direct blow on the flexed knee. This case of a double supracondylar fracture is, however, a rarity and is reported because it presents certain special problems in management and nursing.

A corporal of the Royal Military Police was admitted to the B.M.H., Hanover, on 15th March, 1958, following a road traffic accident in the Soltau district of North-West Germany. The accident occurred at 0230 hours and he was admitted to the German hospital, Soltau. He was transferred by ambulance to Hanover at 0700 hours the same day and arrived three hours later. An X-ray examination revealed a supracondylar fracture of each femur. The fracture on the left side was impacted and minimally displaced medially and posteriorly. The right side showed a supracondylar fracture which was grossly displaced (see Plate I, *A*). There was overlap and the distal fragment was flexed backwards on the proximal fragment, making an angle of 40 degrees, the gastrocnemius insertion flexing the lower fragment at the knee joint.

On admission, he was critically shocked, his blood pressure was 60/0 mm. of mercury and he could be roused only with difficulty. He was given an immediate transfusion of one pint of dextran followed by three pints of blood. The Martin transfusion pump was used. In an hour his condition had improved considerably and he had a blood pressure of 110/60 mm. of mercury. Arterial supply to both legs was normal and all pulses were palpable in the usual positions.

A Steinmann's pin was inserted through the right tibial tuberosity and skeletal traction maintained with the limb placed on a Braun's frame with the end of the bed raised 20 inches. This method of splintage was exchanged the following day for a bent-knee Thomas splint. At the same time a second Steinmann's pin was inserted through the left tibial tuberosity and similar traction was applied to this limb, using a second bent-knee Thomas splint. An X-ray examination of the right femur twenty-four hours after the application of traction showed the overlap to be partially overcome, but the displacement was still present (see Plate I, *B*).

Under anæsthetic three days after admission an attempt was made to reduce

the fracture on the right side by using slings and pads under the fracture site and exerting vertical traction. The attempt at reduction was a failure, which, at operation later, was shown to be due to interposition of soft parts, and the pressure exerted under the fracture site caused embarrassment to the circulation to the leg and foot. This method of reduction therefore had to be abandoned.

On 22nd March, 1958, seven days after admission, an open reduction of the fracture on the right side and insertion of a Kuntschner nail was carried out, an antero-lateral approach being used. The fracture was found to be comminuted with a free antero-medial fragment. There was interposition of muscle tissue between the fragments. A $16\frac{1}{2}$ in. by $\frac{5}{16}$ in. nail was used. There were $3\frac{1}{2}$ inches of bone in the lower fragment and an anatomical reduction was produced, using the loose fragment as a graft. Under X-ray control the lower end of the Kuntschner nail was brought to within three-quarters of an inch of the knee joint and became impacted in the anterior cortex of the femur, thus gaining a firm hold. A final X-ray showed complete anatomical reduction of the fracture (see Plate I, *C* and *D*).

It was not considered safe to leave the limb without external splintage because of the risk of external rotation of the leg at the fracture site. The fragments of the left fracture were manipulated into better position and then a double hip spica was applied.

The plaster was changed fourteen days later and after removal of the stitches a firm P.O.P. double spica was applied. At the time of writing, six weeks after operation, the satisfactory position of both fractures is maintained. The patient has been comfortable during this period and nursing has been no problem. Immobilisation of the limbs in a P.O.P. double spica will have to be continued, however, until union of the fractures is well advanced.

DISCUSSION

The control of the lower fragment in supracondylar fractures of the femur has, as Watson-Jones says, "exercised the ingenuity of generations of surgeons." In cases where there is a flexion deformity of the lower fragment, manipulation of the fragments without the aid of skeletal traction is invariably unsuccessful. Bohler recommends skeletal traction from a Steinmann's pin inserted through the tibial tuberosity with the limb placed on a Braun's frame with its angle behind the fracture site. A bent-knee Thomas splint may be used instead of the Braun's frame. Reduction is brought about using slings and pads applied under the fracture site. Successful results have been reported using a second Steinmann's pin inserted through the lower fragment of the femur and exerting vertical traction. This is, however, not without danger to the femoral artery as it emerges from the sub-sartorial canal. A Kirschner wire can also be used in the same way with less danger to vessels and nerves.

Closed reduction often fails, in which case open reduction must be used. Fixation with an intra-medullary nail can be used in some cases when the lower ragment is of sufficient length, but when this is too short a plate and screws

may have to be used. The use of plates and screws is, however, undesirable because of the proximity of the fracture to the knee joint.

All these methods are applicable in the single supracondylar fracture, but the nursing problems encountered with a double supracondylar fracture are considerable when both legs are on traction. For the patient to use the bed pan and urine bottle the legs must be widely abducted, which imposes an undesirable lateral pull at the fracture site. With both legs elevated on traction the entire weight of the body is taken on the sacral region. With the possibility of twelve weeks in this position the danger of skin sores is very great.

When two Thomas splints are applied to the same patient, the rings impinge on one another in the perineal region. Two pulley systems exerting longitudinal traction and two exerting upward traction require a complex system of weights, pulleys and strings. All weights must be free in their rise and fall, and two overhead beams are required with a scaffolding at the lower end of the bed. These pulley systems require constant adjustment and the patient suffers a considerable amount of discomfort. Our aim was to immobilise both fractures if possible so that the patient could be moved in bed, turned on his front, and make nursing as simple as possible.

The use of the Kuntschner nail for a supracondylar fracture has not been generally applied in the past because of the shortness of the lower fragment and the instability of the Kuntschner nail in this region. Our X-ray films show the lower end of the Kuntschner nail three-quarters of an inch from the knee joint and impacted against the anterior cortex of the femur, thus giving it a firmer hold in this part of the bone. The nail finds itself in this position because of the natural anterior bowing of the femur.

SUMMARY

A case of bilateral supracondylar fracture of the femur, the left side impacted and only slightly displaced, the right side grossly displaced, is described. Bilateral skeletal traction and the use of two Thomas splints led to considerable nursing problems and the right supracondylar fracture failed to reduce with slings exerting vertical traction under the fracture site. A Kuntschner nail driven to within three-quarters of an inch of the knee joint and impacted into the anterior cortex of the femur was used to reduce and hold the right femoral fracture. A bilateral hip spica was applied. Nursing was comparatively easy with this method and union proceeded with the fragments of both fractures in good position.