Percutaneous bone grafting from the distal femur

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BACKGROUND

Internal fixation of lower limb fractures or non-unions may be supplemented with autogenous bone graft harvested from the iliac crest. This can be poor quality, especially in the elderly, and associated with morbidity from pain, haematoma and nerve damage and requires a prepared remote surgical site. Percutaneous harvesting of iliac crest bone¹ has a lower morbidity than an open technique² but is still limited by the quality and width of bone available and risks pelvic penetration. The distal femur contains excellent cancellous bone and an open technique for its harvest has been reported.³ We have routinely used a percutaneous approach for 9 years in over 50 patients.

TECHNIQUE

Through a 1-cm skin incision over the lateral epicondyle, a circular window is made in the lateral femoral cortex using a commercially available precision bone grafting trephine. Multiple cancellous bone cores (Fig. 1) are obtained by passing the trephine in different directions through this cortical window. It is important not to breach the opposite cortex and to be aware of the tibiofemoral and patellofemoral joints. Usually, up to six cylinders of bone can be harvested and, because only a single cortical defect is made, the distal femur is not structurally weakened. Patients are allowed to weight-bear postoperatively according to the surgical procedure they have undergone without additional cast or brace support.

DISCUSSION

This is now our standard bone grafting site for lower limb surgery unless structural tri-cortical graft is required when an open iliac

Figure 1 Cancellous bone core.

crest approach is used. It affords an excellent volume of good quality bone, even in the elderly, from within the operative field with minimal morbidity. There have been no bleeding complications, haematomas, nerve injuries or iatrogenic supracondylar femoral fractures.

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An aid to tibial alignment in total knee replacement

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Figure 1 Extensor hallucis longus marked at the ankle pre-operatively.

Figure 2 Extensor hallucis longus mark clearly visible after draping.

BACKGROUND

During a knee replacement in the UK, the majority of tibial components are inserted using extramedullary alignment. Proximal landmarks for the alignment jig include the tibial tubercle, anterior to the origin of the posterior cruciate ligament, and the medial third of the tibial tuberosity. Distal landmarks include the centre of the ankle and the second metatarsal. The centre of the ankle can be difficult to assess, especially in obese patients or if the ankle is covered by surgical drapes. The second metatarsal position can be altered dramatically by foot rotation. We describe a technique to aid tibial alignment by using a visible mark at the ankle.

TECHNIQUE

Pre-operatively, the extensor hallucis longus (EHL) tendon at the ankle is marked with a black permanent marker pen (Fig. 1). The patient is asked to extend the big toe. This allows EHL to be visible at the ankle if not, it is easily palpable. EHL has been shown to represent the centre of the ankle.¹ By placing the foot/ankle in a clear bag during draping, the mark over EHL is clearly visible during surgery. The pen mark of EHL at the ankle is used as the distal reference for the extramedullary tibial alignment jig (Fig. 2).

DISCUSSION

One of the known causes for early revision surgery following knee replacement is component malalignment.²⁻⁴ This technique

provides a fixed, visible distal reference at the ankle which may aid tibial alignment.

References

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Gallow's traction in an incubator for treatment of neonatal femoral fracture

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BACKGROUND

Osteopenia and fractures from nutrient deficiencies can occur in preterm infants. Fractures not related to birth trauma are diagnosed in 1.2% of preterm infants between the 24th and the 160th day of life.¹ They are usually associated with a low intake of calcium and phosphorous.^{2,3} Poor bone mineralisation has been shown in 55% of infants born at less than 1000 g. Treatments of femoral fractures in an incubator have practical difficulties making treatment with a hip spica or splinting difficult.

TECHNIQUE

We report the use of 'Gallow's' traction in an incubator using a frame made from thermoplastic material (Fig.1). The frame is constructed from standard thermoplastic splints (Fig. 2) and provides vertical-extension 'Gallow's' traction to a femoral fracture in a pre-term infant whilst still in an incubator.

DISCUSSION

In the pre-term infant, treatment of a femoral shaft fracture can be difficult using the vertical-extension method of traction as they are commonly in an incubator. This method employing a frame made from simple and cheap thermoplastic splints can be