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Bruce Campbell, Section Editor

Technical Section

TECHNICAL NOTES, TIPS AND DEBATES

Technical Notes

The subtalar distraction screw

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BACKGROUND

Arthrodesis is an effective procedure for relieving the pain of subtalar joint arthritis and can be used for correcting foot deformity.[1,2] To obtain a satisfactory arthrodesis between two bones, a number of prerequisite conditions must be satisfied. These include: (i) stability; (ii) optimal local biological conditions (*e.g.* a healthy blood supply and lack of infection); and (iii) maximal opposition of surfaces which have been denuded of soft tissue, osteophytes and cartilage. In the narrow space of the subtalar joint, access to clear the opposing surfaces is often difficult. We present a simple technique which markedly improves access to both the anterior and posterior facets when performing a subtalar arthrodesis.

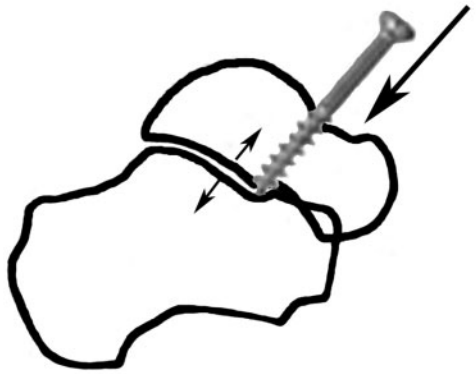

Figure 1 Diagram indicating how the joint is opened (small arrows) with screw advancement (large arrow).

TECHNIQUE

During subtalar arthrodesis, a large fragment, partially threaded cancellous screw is placed across the joint in a dorso-medial to plantar-lateral direction. In this technique, one initially drills through the talus only. The cancellous screw is then advanced through the talus to abut the calcaneum. As the calcaneum has not been pre-drilled, the screw does not penetrate this bone, but rather has the effect of jacking out the subtalar joint with further advancement. This gives a much improved exposure of the subtalar joint which can then be prepared for arthrodesis. Following this, the screw can be removed, the calcaneum drilled and the screw then advanced across the joint to give the required compression.

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A simple method of dressing external fixator pin sites

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BACKGROUND

The use of external fixators in both trauma and elective orthopaedics is increasing. Although there are a wide variety of protocols for pin site care throughout the UK,[1] there is no consensus on how often pin sites should be dressed, with what, and whether they should be left open to the air at any stage. Pin site infection rates of up to 80%[2] have been reported and an on-going Cochrane Review aims to reduce this by allowing practice to be more evidence-based.[3] The Ilizarov Institute in Kurgan, Russia, claims low pin infection rates. Although this is a multifactorial complication, it may be influenced by their dressing technique. Pin sites are dressed with gauze sponges held against the skin with rubber stoppers, specifically manufactured for this purpose, which

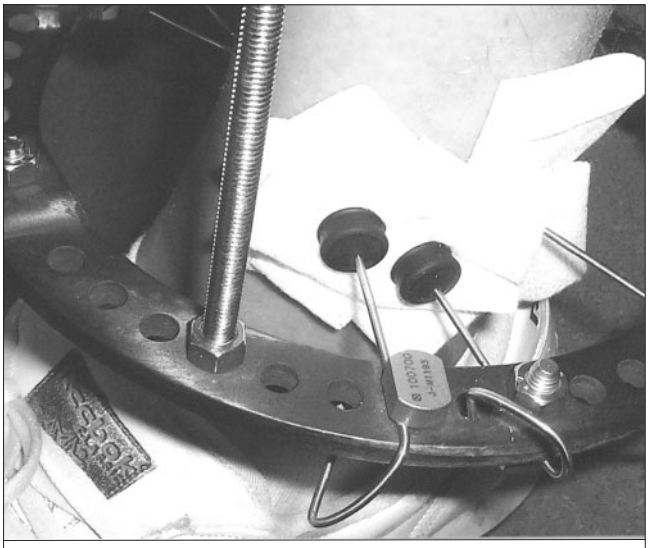

Figure 1. Rubber bungs holding dressings securely around the fine wires of a circular frame.

are passed over the wires.[4] These provide pressure at the pin site. We describe a simple method of dressing pin sites based on this principle that can be used in British operating theatres.

TECHNIQUE

Plastic syringes consist of a barrel and a plunger with a rubber bung, These are readily available in every operating theatre and a 5-ml syringe costs about three pence. The rubber bung from a 5-ml syringe can easily be removed from the plunger and slid over the end of either a half pin or both ends of a fine wire. Care must be taken to do this before the frame is attached. We recommend applying the bungs each time a pin is inserted and a vigilant assistant is invaluable. At the end of the procedure, a cut piece of gauze is applied around the pin site and held in place by the rubber bung (Fig. 1). This provides a secure, non-bulky dressing. The bungs can be slid back up the pin when the dressings are changed and left up if the pin site is to remain uncovered. Should the pin site begin to discharge, the rubber bung can once more be used to hold the dressings securely. We have found this to be a simple, quick, inexpensive and reliable method of pin site dressing.

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A simple technique for obtaining particulate bone autograft during primary total hip replacement

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BACKGROUND

During primary total hip replacement (THR), it is sometimes necessary to have particulate autograft available, for example, to graft the acetabular floor if a degree of protrusio is present or if the floor has been inadvertently breached during reaming. Acetabular reamings can be used, but such bone may not be plentiful enough and is of variable quality. The patient's femoral head is a convenient, but less often used, source of good quality graft.

Graft can, in theory, be obtained from the resected head using a bone mill or manually. It is unusual, however, to have a bone mill available in the setting of a primary THR and the use of curettes or other instruments is a cumbersome task as it is difficult to hold the head securely in one hand whilst using the other to obtain graft.

TECHNIQUE

We routinely use a method to obtain graft from the femoral head before it is resected. After marking the required femoral neck resection level, the graft is harvested by using a few appropriately sized acetabular reamers to ream the femoral head (Fig. 1). A

Figure 1. Reaming the femoral head.

Figure 2. The graft obtained free of articular cartilage.

sliver of femoral head can be removed before reaming so that the reamer does not skid off, and to ensure that the graft obtained is free of articular cartilage. Graft collects in the reamers. Plentiful, good-quality graft is easily obtained (Fig. 2). The head remnant is then resected as usual.

DISCUSSION

This method is sufficiently quick and easy that it can be used routinely during total hip arthroplasty so that graft is available in case it is required during the procedure. In revision cases, where femoral head allograft is to be used as a source of particulate graft, this technique can also be used as an alternative to a bone mill, but the femoral head needs to be securely held during reaming.

The 'hiss sign': an effective way of confirming satisfactory intra-articular placement of the first portal in shoulder arthroscopy

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BACKGROUND

Shoulder arthroscopy is an increasingly common procedure carried out for both diagnostic and advanced interventions. Correct first portal placement is critical in ensuring adequate visualisation and can be difficult for even experienced arthroscopists. If the fluid pump is started whilst the cannula tip is located extra-articularly, rapid soft tissue swelling will ensue making subsequent correct cannula placement more difficult. Traditionally, the joint is distended with saline via a spinal needle prior to cannula insertion; however, this is not a guarantee of correct placement and may in itself be extra-articular.

We describe a technique of determining intra-articular placement of the first portal, which has been used by the senior author reliably in over 300 cases.

TECHNIQUE

This technique can be employed with the patient positioned in the beach chair position or laterally with a traction weight of 5–10 lb. The posterior portal is located 2–3 cm inferior and 1–2 cm medial to the posterolateral tip of the acromion – the 'soft spot' representing the interval between the infraspinatus and teres minor muscle. Ensure that the arthroscope trocar is seated securely within the sheath, the inflow/outflow taps are closed and that nothing is attached to them. After a small skin incision, introduce the arthroscope trocar and direct it towards the coracoid process. The position of the glenoid and humeral head can be palpated with the tip of the trocar to assist with correct glenohumeral joint entry. Then, advance the arthroscopic cannula into the joint.[1]

Open the inflow tap and, if the cannula is within the joint, the negative intra-articular pressure[2] will neutralise. This results in an audible 'hiss' confirming correct placement of the cannula. The pump tubing may then be connected and safe insufflation of the joint commenced.

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A reliable technique for early reduction of ankle fracture dislocations

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BACKGROUND

Ankle fracture dislocations must be reduced at the earliest opportunity to reduce the incidence of postoperative complications.[1] In a busy emergency department, the preparation and administration of

Figure 1. With an assistant supporting the patient's knee, longitudinal traction is applied to the calcaneus.

intravenous analgesia and sedation may delay reduction. We describe a technique in which rapid reduction of ankle fracture dislocations can be carried out without any form of sedation or analgesia.

TECHNIQUE

The patient should be lying supine on a trolley and asked to flex the hip and knee on the affected side to 90°. With the knee passively supported by an assistant, longitudinal traction on the calcaneus results in reduction of the dislocated tibio talar joint (Fig. 1).

DISCUSSION

The anatomical basis of this technique is attributable to the relaxation of the gastrocnemius-soleus complex effected by the exaggerated hip and knee flexion described above. This method of reduction was well tolerated by patients when used in our emergency department with rapid diminution of pain following the manoeuvre. To our knowledge, this technique has not been described previously.

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For debate

Patient positioning on the operating table: a priority in surgical training?

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The clinician's responsibility to the patient extends from the initial consultation to final discharge. As surgeons, we carry the onus of safely positioning our patients in theatre to prevent severe injury and permanent disability.[1–7] Such 'misadventures' should be avoided, for the well being of our patients, and to circumvent medical litigation. The Medical Defence Union states: 'In terms of poor on-table positioning, defence based on lack of training may not be possible'. The legal test of breach of duty (negligence) is the Bolam test and applies to diagnosis, treatment and disclosure of risk. In a case of litigation, defence of the practitioner's actions may fail, on the grounds that medical experts would expect any practitioner to ensure that the patient's position is safe and that any equipment used in supporting the patient is not faulty and is properly used prior to operating.

Currently, correct techniques in patient positioning are not part of the training curriculum for basic or higher surgical trainees. We confirmed this with each of the three British Royal Colleges of Surgery, the Specialist Advisory Committee for Higher Surgical Training and the British Association of Plastic Surgeons. The training of surgeons in patient positioning, if at all, is an informally acquired theatre skill. The situation is similar in the US.

The risk of unintentional iatrogenic injury escalates with the complexity and urgency of the operation. Polytrauma cases may be rushed into theatre for simultaneous reconstructive procedures by multiple teams. Such operations may become prolonged, with inadequate precautions culminating in avoidable injuries such as pressure sores. Co-morbid disease or its significance may not be fully recognised by the theatre team positioning patients (or repositioning intra-operatively). Multistage procedures may require 'all hands on deck' to turn corpulent or delicate patients from supine to prone positions and back again (this may mean the surgeons rescrubbing). Our own experience highlights this. An obese 38-year-old woman with advanced breast cancer, carrying the BRCA-2 gene, required bilateral mastectomies with immediate bilateral latissimus dorsi reconstructions. Postoperatively, she suffered prolonged paraesthaesia and weakness in a C5 and C6 spinal root distribution. We suspect her pre-existing cervical spondylosis was exacerbated by her position on

the operating table, resulting in the MRI-confirmed prolapse of her C5–C6 disc.

Surgical trainees lack the formal training that other theatre staff receive. The National Association of Theatre Nurses issues to its members formal guidelines on equipment, positions, safeguards and assessment of individual patient needs. Theatre nurses are also expected to attend sessions with manual handling instructors. The Royal College of Anaesthetists includes patient positioning in its curriculum for senior house officers who also receive training by the hospital's manual handling trainer. Whilst not formally a part of its higher trainee curriculum, a recent Anaesthetic Fellowship exit exam included a long question on patient positioning.

Through formal training and assessment we, as surgeons, can minimise the risks to patients and protect ourselves from litigation. The surgical colleges should recognise the problem and drive the improvements needed to the surgical training curricula.

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Investigation of a surgical myth

Dry or damp theatre swabs?

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BACKGROUND

Many urological surgeons in the East of Scotland use damp theatre gauze swabs for operating. This is based on claims that damp swabs absorb blood more quickly than dry swabs (Mr Turner-Warwick, personal communication). We had not encountered this practice before and decided to examine this theory formally.

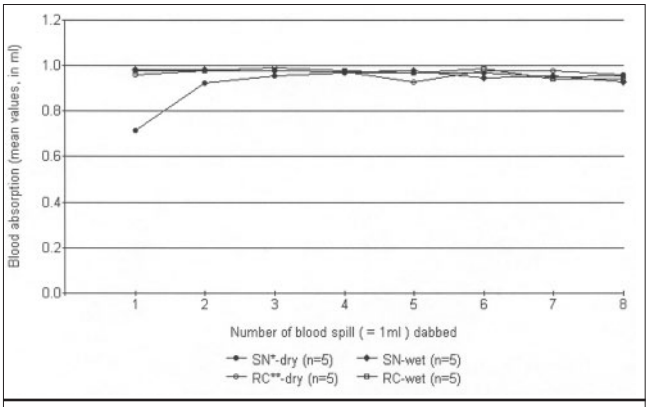

Figure 1 Theatre gauze swab blood absorption.

METHODS

We used dry and damp swabs of two commonly used brands (SN – Smith & Nephew Healthcare Ltd, Healthcare House, Goulton Street, Hull HU3 4DJ, UK <www.smith-nephew.com>; and RC – Rocialle Medical Ltd, Dales Manor Business Park Sawston, Cambridge CB2 4TJ, UK <www.rocialle-medical.com>). Damp swabs were soaked in 0.9% N/saline and the fluid wrung out before use. Each tested swab was used to dab a row of 8 blood spills (1 ml = 2 cm diameter) consecutively with a 1 s contact time. The remnant blood volume was measured (digital scales accurate to 0.01 g). Additional tests assessed the overall absorptive capacity, 3-s contact time and interobserver variability.

RESULTS

Damp swabs had 15% less total absorptive capacity (14.0 ml) than dry swabs (16.5 ml). Dry SN-swabs showed incomplete absorption compared to damp SN-swabs (dab1 – dry = 72%, damp = 98%, $P < 0.001$); dab2 – dry = 93%, damp = 98%, $P < 0.05$) on dabbing the first two blood spills. Dry and damp SN-swabs both showed complete absorption of all subsequent blood spills (3–8). Dry and damp RC-swabs both showed complete absorption of all blood spills (1–8). The initial absorptive difference of dry and damp SN-swabs was reduced by higher pressures on dabbing (interobserver variability) and abolished by 3-s contact time.

DISCUSSION

Dabbing by hand and by different individuals reflects theatre conditions better than tests with mechanical devices. A clinically significant difference between dry and damp swabs was not observed. A minor initial absorption difference was seen with one brand only and this could easily be corrected by a slightly longer contact time. Disadvantages of using damp swabs include overall reduced absorbency, cost of normal saline and extra preparatory work. We recommend that the use of damp swabs should be abandoned.

Technical Tips

Placement of guidewire for fixation of intertrochanteric femoral neck fractures

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It is well known that correct placement of the sliding screw in the femoral neck is essential when fixing intertrochanteric fractures of the femoral neck. The best purchase for fixation is along the centre of the neck in both anteroposterior and lateral planes (Fig. 1).[1] This enables the lag screw to be advanced to within 10 mm of the femoral head joint surface without risking penetration. Central positioning also allows maximal telescoping of the screw. Such points are important in reducing the risk of failure of the fixation.

Inserting the guidewire into the femoral neck is most commonly performed through the 135° jig as this facilitates subsequent attachment of the plate to the sliding screw. Obtaining the optimum position of the guidewire in the femoral neck can prove difficult to the junior surgeon as adjustments of only a few millimetres have to be made. Such small adjustments can be difficult if the incorrectly placed guidewire is not removed as it may obstruct repositioning of the jig on the femoral shaft. Numerous incorrect passes with subsequent wire removal will also prove detrimental to the bony integrity of the neck. It is common to be left with a guidewire in a worse position than the initial attempts. We describe a method where guidewire position can be improved by use of an AO parallel guide without the need for removal of previous wires.

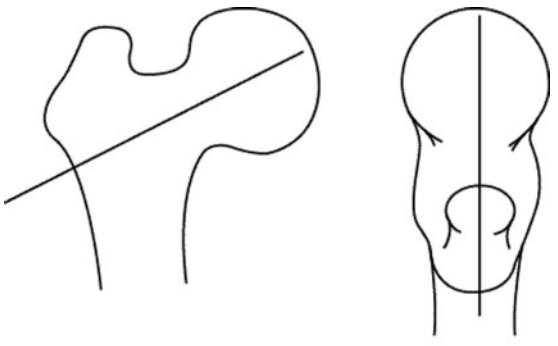

Figure 1. Antero-posterior and lateral views of the proximal femur showing the optimal position of the guide wire.

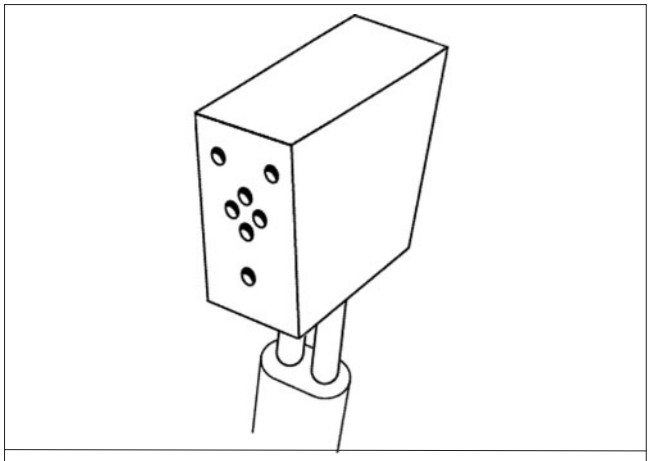

Figure 2. The AO parallel guide provides a number of holes for passage of guide wires to obtain central position.

If the guidewire has been inserted into the femoral neck with the use of the 135° jig but has been judged to be off-centre in any plane, we have found that replacement of the 135° jig with an AO parallel guide over the end of the wire will provide a number of options for passing a guidewire parallel to the initial attempt but in a differing plane (Fig. 2). Choosing the hole for the most central position enables adjustment to be made without having to remove previous guidewires and move the jig on the femoral shaft. Once a guidewire has been passed in the correct position, the parallel guide can be removed, other guidewires withdrawn and the femoral neck reamed in the usual manner.

Reference

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Orthopaedic instrument ideal for manual evacuation of faeces

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The Murphy's skid is an instrument employed for dislocating the hip joint. It is little used nowadays but it can instead be utilised for evacuating faeces from the rectum. It is smooth and thin enabling easy insertion through the anus. It is rigid and spoon-like allowing large amounts of faeces to be withdrawn. It is over

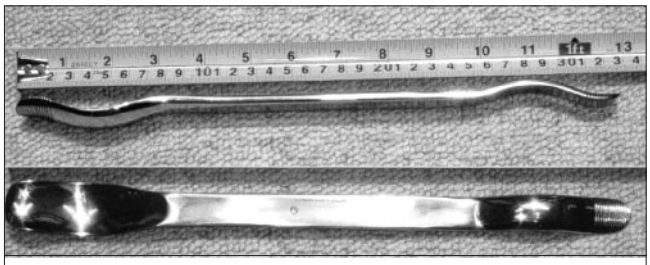

Figure 1. The Murphy's skid.

20 cm long and so can pursue faecal material out of reach of the finger or teaspoon. The Murphy's skid has been used by the author to speed up this unpleasant procedure safely and is proposed for this use.

Drains, planes and automobiles

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Secure fixation of chest drains is important especially during patient transfer. We present a simple, quick method of fixation for use on chest and other drain tubes. A 'flag' of Sleek tape (Smith & Nephew Medical Fabrics Limited, Brierfield BB9 5NJ, UK) is stuck to itself around the tube (Fig. 1, left). This can be applied prior to insertion. One or more interrupted sutures are placed in the chest incision as required. A heavy silk suture is placed through the skin of the chest wall, adjacent to the tube, and through the flag of tape, and tied (Fig. 1, right). The drain is now fixed securely.

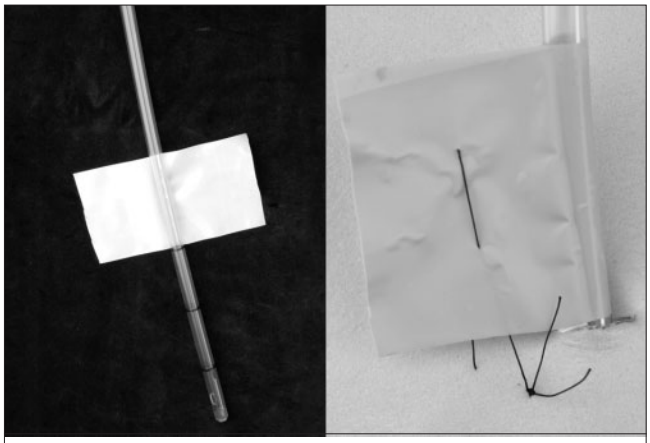

Figure 1. The 'flag' of Sleek tape (left); the chest drain secured to the chest wall (right).

A simple method for cannulated screw removal

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Cannulated screws are often used in the proximal femur for intracapsular fractures and slipped upper femoral epiphyses. Occasionally, these screws have to be removed. On removal, the screw head may become damaged so the screwdriver can no longer engage the screwhead. If this occurs when the screw has been partially removed, the screw can be bent with pliers as shown in Figure 1 and can then be removed by hand with ease like an Allan key.

Figure 1. Conversion of cannulated screw to Allan key.

Manual evacuation of the rectum

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Manual evacuation of faeces from an impacted rectum is a rewarding yet unpleasant and smelly job, usually delegated to the most junior member of the surgical team. Lignocaine spray (AstraZeneca, Kings Langley WD4 8DH, UK), sprayed directly into the nostrils (if a clean applicator is available) or sniffed from a gauze swab, ablates the sense of smell promptly and the effect lasts for up to 40 minutes. Caution should be exercised in the tearoom after the procedure as anaesthesia may also affect the lips. We always use two or three pairs of gloves; otherwise the smell tends to linger on the hands. Of course, caution must be exercised in order not to damage the anal sphincters.

Simple mirror for teaching perineal procedures in lithotomy

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Perineal procedures are often performed in the lithotomy position. The surgical assistant is usually required to hold the anal retractor from 'above', as it is often difficult to fit both surgeons between the patient's legs. However, the assistant may find it difficult to observe the operation from 'above' and may, therefore, lose concentration as well as important training opportunities. Attempts to 'peep' over the top often results in inadvertent movements of the retractor.

With a simple removable hinged mirror fixed to the operating lights behind the operating surgeon's head, the assistant can then observe the entire procedure. Furthermore, this allows the assistant to finely adjust the position of the retractor without prompting from the surgeon. The detachable mirror, an extension used for improving views whilst towing, can be bought cheaply from any motoring accessories shop.

A simple radiolucent drill guide to aid intramedullary nail locking

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Distal femoral locking can be unforgiving. We recommend the use of a disposable plastic Yankauer sucker as a radiolucent drill guide and tissue protector to facilitate this. The bend of the sucker is first exaggerated to 45–60°, and the drill passed retrograde up the sucker to create an opening on the neck of the sucker in line with its tip. The drill can then be passed antegrade through this opening, down to the tip. The proximal part of the sucker is used as a handle to control the drill effectively and prevent spinning off the cortex.

Erratum

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USE OF RHYS-DAVIES EXSANGUINATOR IN POSITIONING FOR RETROGRADE FEMORAL NAILING

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We apologise to the authors and the readers for printing the figure upside down. The exsanguinator should be placed under a flexed knee joint.