



Technical Section

TECHNICAL NOTES AND TIPS

Technical Notes

Use of a bone awl to aid removal of broken interlocking screws

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BACKGROUND

Local complications of locked intramedullary (IM) nailing are numerous and include delayed or non-union, osteomyelitis and nail or screw deformation or breakage.¹ Removal of IM nails can be technically difficult especially if a broken or bent nail or screw needs to be removed.² We report a surgical technique to aid broken screw removal.

TECHNIQUE

Skin and subcutaneous tissues overlying the interlocking screw are divided as usual down to bone. The screw head is exposed and the proximal fragment of the interlocking screw is unscrewed. In most

cases, the distal retained fragment of the interlocking screw, if small, does not interfere with the IM nail removal. It can, however, continue to 'lock' the IM nail and prevent its removal. In these cases, we use a bone awl inserted through the same track under image-intensifier control with the distal fragment being pushed through. (Fig. 1). This frees the IM nail, which can then be removed uneventfully. The retained fragment can then be extracted through a small overlying skin incision.

DISCUSSION

Broken interlocking screws are a recognised complication following IM nailing procedures. When the distal part of a broken screw is jammed in the screw hole, it can prevent nail removal. Use of excessive force to remove the nail will damage and weaken bone as the screw scores bone during nail removal. Even worse, the screw may jam in the nail so that the nail is completely stuck. Use of a bone awl as described will avoid these complications and allow safe nail removal.

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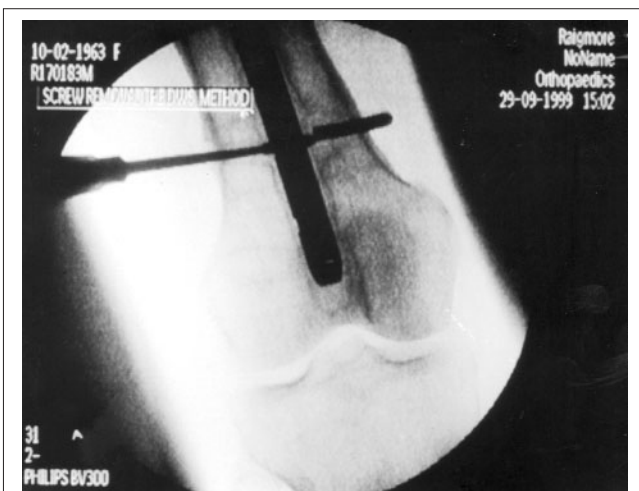


Figure 1 Intraoperative radiograph demonstrating use of bone awl.

Pain control after tricortical iliac crest bone grafting: a new technique

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BACKGROUND

Autologous tricortical iliac crest grafting is used in reconstructive orthopaedic procedures. Harvesting from this site can cause complications, primarily postoperative pain.¹ We describe a new surgical technique, which we feel improves donor site pain.



Figure 1



Figure 2

TECHNIQUE

A curved incision is made along the iliac crest following its contour, starting 5 cm from the anterior superior iliac spine. Subcutaneous fat is divided to expose the muscle attachments to the ilium.

A 1/3-tubular plate is pre-contoured over the iliac crest, the size depending on the amount of graft required but at least two holes must be available anterior and posterior to the area of crest required (Fig. 1). These holes are pre-drilled between the tables of the iliac wing. The muscle attachments to the iliac wing are mobilised from the outer table using cutting diathermy and blunt dissection, maintaining haemostasis. Transverse cuts are made and the graft removed.

The plate is fixed using 25–30 mm cancellous screws (Fig. 2) and the muscle attachments are repaired using 1.0 vicryl. The site is infiltrated with 20 ml 0.5% chirocaine and the wound closed in layers. A superficial drain remains *in situ* for 24 h.

DISCUSSION

Iliac crest harvesting complications include: heterotopic bone formation,² incisional hernia,³ and crest fracture.⁴ The commonest complications include pain, ambulatory difficulty and sensory disturbance around the donor site.⁵

At our unit, we stabilise the iliac crest using a pre-contoured plate in patients who require tricortical grafting. Anecdotally, their pain in the early postoperative period is better controlled and the physiotherapists feel that better early mobilisation is being achieved.

References

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Minimally invasive stapled surgical approach to the management of sigmoid volvulus

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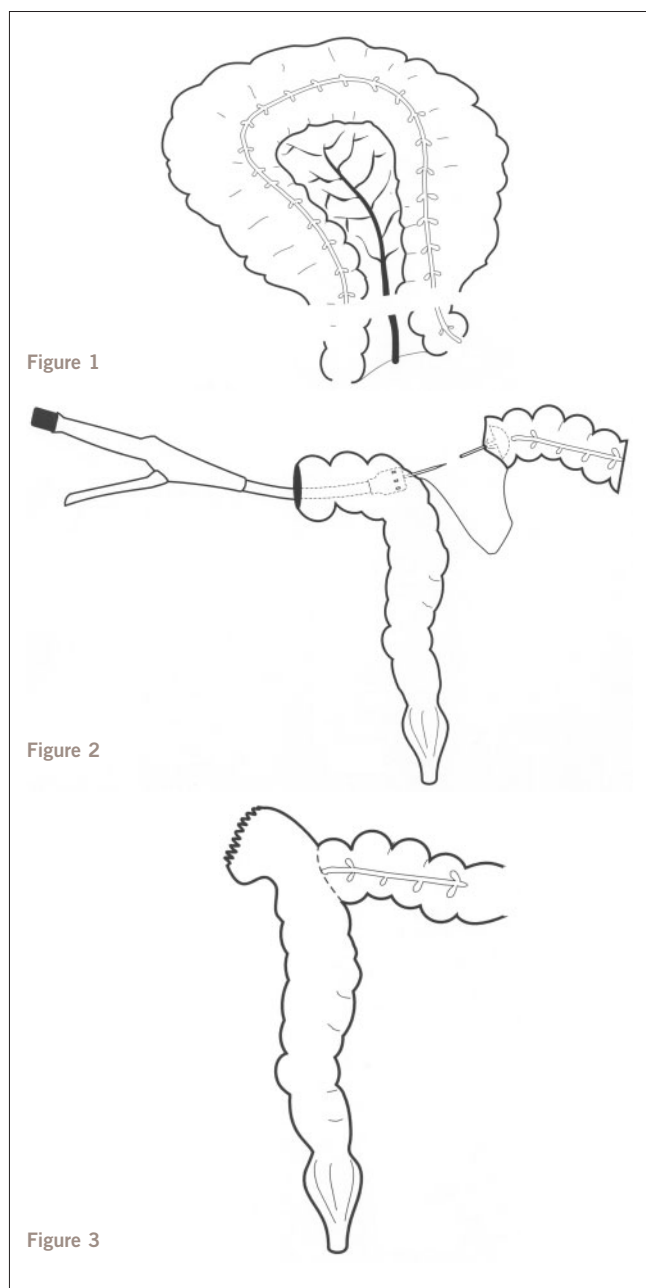
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BACKGROUND

The incidence of volvulus as a cause of large bowel obstruction is 2–5% in the West¹ and commonly affects the sigmoid colon.² It is commonest in elderly, institutionalised patients who are often unfit for major surgery. Colonoscopic decompression can be achieved in 75–90% of cases⁴ and derotation in 58%.⁵ However, the recurrence rate is high (43–90%),³ requiring semi-elective surgery.

TECHNIQUE

We propose a simple, minimally invasive, surgical technique to resect the volvulus. Under general anaesthesia, a 5–7 cm muscle splitting left iliac fossa (Lanz) incision is made and the redundant sigmoid loop is delivered and untwisted. Provided the colon is viable, the mesenteric pedicle is ligated and resection margins defined (Fig. 1). The sigmoid colon is resected and a purse string suture inserted to



the proximal end. The head of a 33 mm circular stapler is positioned and the purse string approximated. The circular stapler is passed through the lumen of the distal end, and the spike brought out through the ante-mesenteric border at the rectosigmoid junction and stapled to the proximal limb (Fig. 2). The redundant rectosigmoid is excised with a linear stapler and over-sewn with absorbable monofilament suture (Fig. 3).

Discussion

Most patients with sigmoid volvulus require definitive surgery. A conventional laparotomy and sigmoid colectomy is associated

with considerable morbidity. The approach we have described has the advantage of a small muscle splitting incision, simple extra corporeal stapled anastomosis of disparate colonic segments without the danger of any faecal spillage.

References

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Foley catheter aids the treatment of traumatic vascular injuries

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BACKGROUND

Lacerations to major vessels often present with life-threatening haemorrhage and can be difficult to manage with compression alone in the acute setting without definitive surgery. We describe a simple technique popularised by many surgeons which allows the rapid control of bleeding without the need for compression, allowing safe visualisation of the extent of injury.

Technique

The careful insertion of a spigoted 8- or 12-FG Foley catheter under direct vision into both proximal and distal ends of peripheral transected vessels followed by gentle inflation of the balloon allows effective control of the haemorrhage (Fig. 1). For larger limb vessels such as femoral artery and vein, a 14-FG Foley can be safely accommodated, with 16-FG catheters being used to tamponade caval or aortic lacerations and ruptures. This has the intended benefit of releasing the surgeon to plan definitive

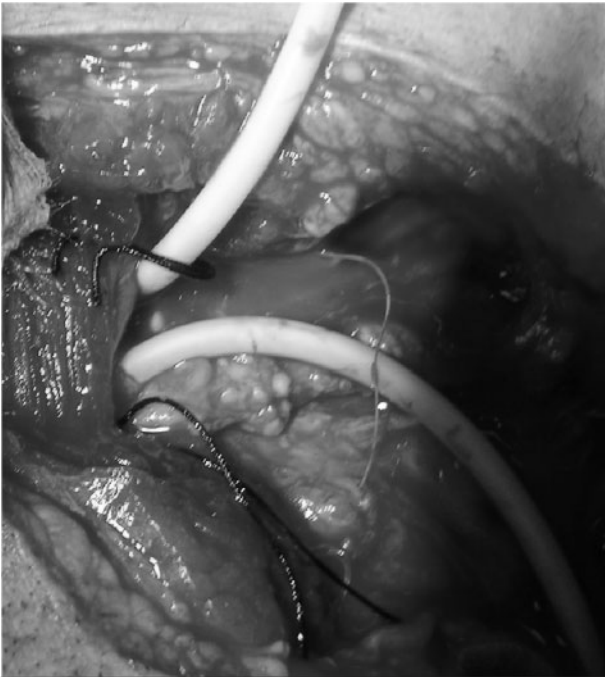


Figure 1 Direct placement of spigoted 12 French gauge Foley catheters into proximal and distal limbs of transected internal jugular vein in a patient presenting with severe haemorrhage from a neck laceration

surgery having once stabilised the patient. This obviates the need to ligate large vessels and minimises vascular trauma induced by indiscriminate clamping of bleeding arteries or veins.

DISCUSSION

The Foley catheter has been successfully used at laparotomy and sternotomy to occlude both great vessels and heart chambers¹ and to tamponade haemorrhage from other penetrating injuries.^{2,3} The direct insertion of a Foley catheter into a bleeding vessel outside of the emergency operating theatre is a further life-saving adjunct which improves both the identification of anatomical structures and visual field.

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The Prolene® zip technique: prevention of wound infections in contaminated abdominal incisions

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BACKGROUND

Wound infection rates after grossly contaminated laparotomy are up to 40%. Previously published data support the use of delayed primary closure to almost eliminate wound infection and reduce incidence of incisional hernia and evisceration.¹ However, these patients usually return to theatre for wound closure with interrupted sutures leaving a poor cosmetic result.

Technique

We describe a technique we have named 'the Prolene® zip'. After contaminated laparotomy, the muscle and fascia layer is closed with a standard mass closure. Povidone-iodine soaked gauze is placed in the wound to keep the fat and skin open and a very loose continuous subcuticular Prolene® suture (polypropylene, Ethicon) is positioned (Fig. 1). The wound is covered with a

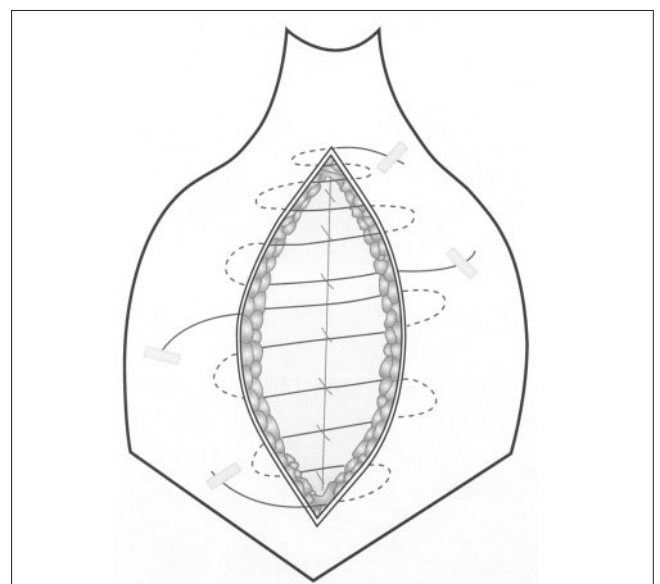


Figure 1

waterproof dressing. When the patient is recovering, the packing is removed and the Prolene® suture is pulled tight like a zip. This can be performed on the ward requiring only simple analgesia. The suture is removed 10 days after closure.

Discussion

We have used this simple technique in 106 patients all of whom had laparotomies for gross intra-abdominal contamination such as perforated appendicitis or faecal peritonitis. The age range was 7–92 years (median, 56 years). The time to wound closure varied between 2–8 days (mode, 5 days), though 6 patients died before wound closure. Six further patients died before discharge with a clean healed wound. The remaining patients were followed until discharge. There was only one superficial wound infection and one case of evisceration. This is a simple technique which may reduce morbidity compared to staples, and leaves an improved cosmetic result.

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A simple technique to assist in the minimally invasive harvesting of the saphenous vein in cardiac surgery

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BACKGROUND

Long saphenous vein (LSV) harvesting is a common procedure performed during coronary artery bypass by the junior surgical trainee. Typically, it is harvested as an open technique, though various methods of harvesting the vein minimally invasively are described. Such methods improve the cosmetic result, wound infection rate and the associated pain and restriction in movement but have led to concerns over the quality of vein harvested.¹

TECHNIQUE

The method involves using a standard laryngoscope with working light, sterilised as its components and then re-assembled with the battery inserted in theatre (Fig. 1). Having incised the skin over the vein at the ankle, the operator creates through blunt



Figure 1 The operator having created a subcutaneous tunnel uses a laryngoscope to visualise the SVG and gently retract the overlying tissues.



Figure 2 Incisions of the leg with skin bridges.

dissection a subcutaneous tunnel over the vein. The laryngoscope is inserted into the tunnel and held by the operator or an assistant. The vein can then be safely dissected from the surrounding tissues under direct vision and with excellent illumination the side branches are ligated and divided. A further short incision is made at the most proximal extent of the tunnel and the process repeated to obtain the desired length of vein conduit. This technique may be even more advantageous in harvesting LSV from the thigh.

Discussion

By creating skin bridges using this simple method it leaves the patient with an acceptable cosmetic result, less pain and restriction of movement but does not compromise on the quality of the vein conduit harvested as it is dissected under direct vision (Fig. 2).

Reference

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Locking loops for flexor tendon repair

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BACKGROUND

The original Kessler suture for repair of flexor tendon lacerations, is a grasping suture.¹ The locking loop configuration described by Pennington² provides superior biomechanical repair properties³ by enhancing holding power at the suture–tendon interface. Important differences between these configurations stem from the relationship of the intratendinous sutures; in a locking configuration, the transverse component passes superficial to the longitudinal component (Fig. 1).

However, due to the obscuring effects of the tendon fibres, it is impossible to be certain that a locking and not grasping loop has been performed. There is also a risk that the needle may damage the suture during the transverse pass. This simple technique used by hand surgeons, avoids this possibility and ensures true locking loops.

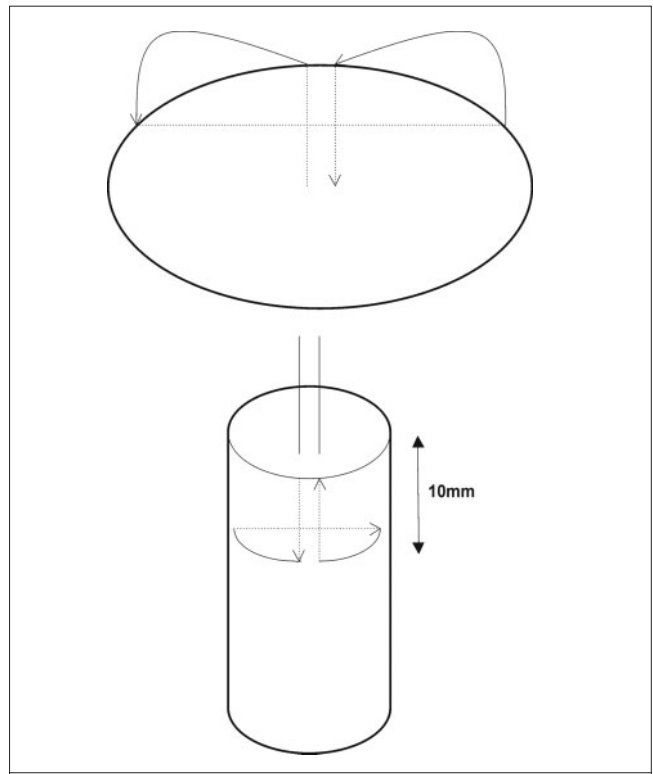


Figure 1 Pennington locking suture (transverse and longitudinal sections). Note relationship of intratendinous suture components. Dashed lines represent suture within tendon substance.

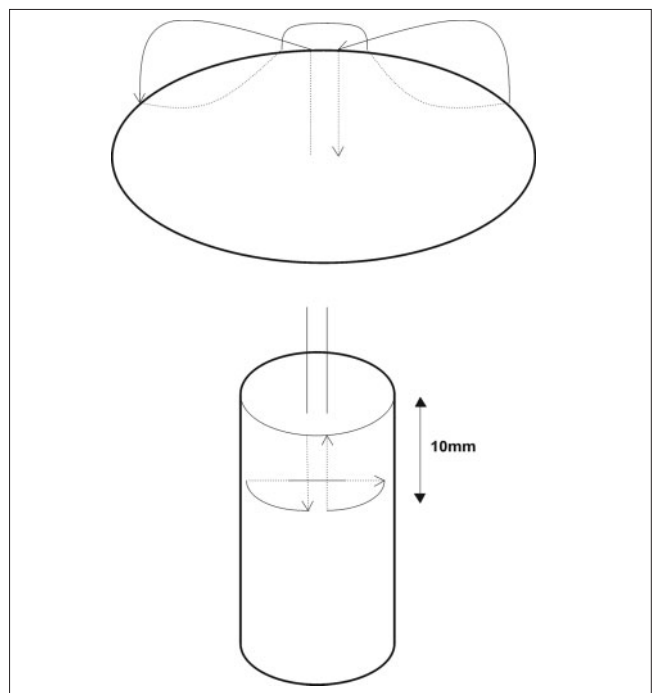


Figure 2 New locking suture.

TECHNIQUE

A central longitudinal pass exits 10 mm from the cut tendon end on the palmar surface (Fig. 2). The needle is then inserted transversely, outside and dorsal to this point and delivered to a point just outside the longitudinal suture. The area of the locking loop thus formed varies with bite size. Next, the suture is re-inserted at a symmetrical point on the other side, to form a second locking loop of equal size (a small transverse length of suture remains on the tendon surface). The second longitudinal component passes under the superficial transverse suture and parallel to the original longitudinal component, exiting the tendon end. With the tendon ends accurately approximated and adequately tensioned this is repeated on the other end, before tying a single buried knot.

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Finger-guided transrectal biopsy of the prostate: A modified, safer technique

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BACKGROUND

Prostate biopsy is the gold standard for the diagnosis of adenocarcinoma in this gland. It is commonly performed on an out-patient basis via the transrectal route and usually with the aid of transrectal ultrasound (TRUS). The principal role for TRUS is to facilitate systematic sampling of all relevant zones of the prostate.¹ Advances such as high resolution probes with biplanar imaging and spring-loaded needles permitting multiple biopsies have ensured that TRUS biopsy has become the method of choice. Simple, finger-guided, transrectal biopsies are indicated in men with significantly elevated prostate specific antigen (PSA) and abnormal digital rectal examination (DRE) in whom radical treatment is not an option.² Biopsy-needle injuries are a potential risk of infection transmission to both patient and operator (especially HIV, hepatitis B and hepatitis C^{3–5}).

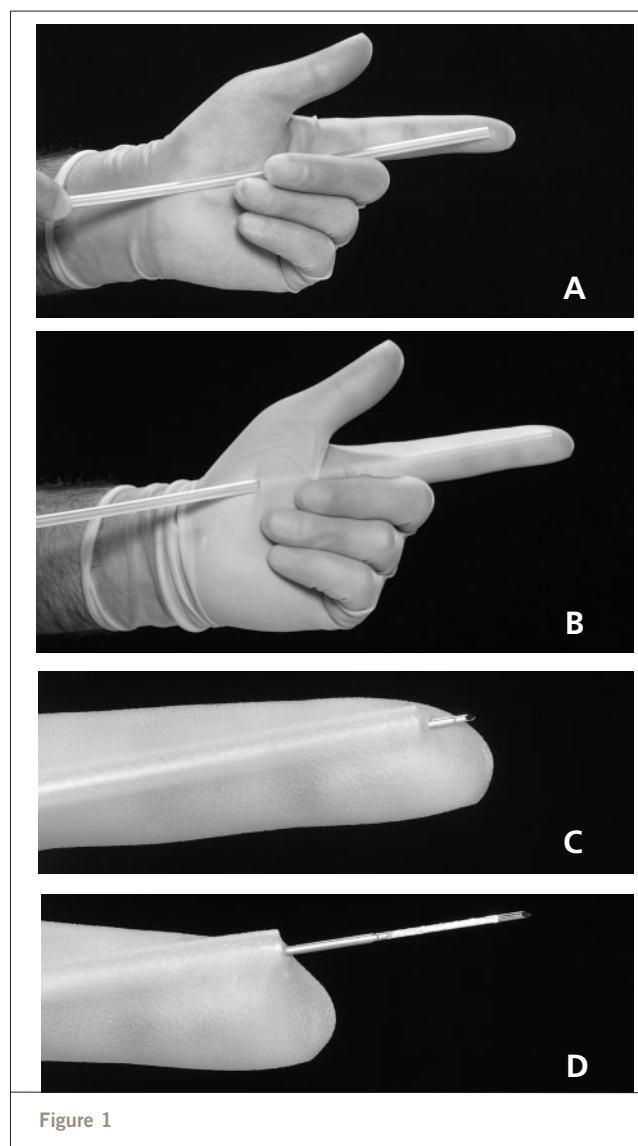


Figure 1

TECHNIQUE

The procedure is illustrated in Figure 1. The biopsy-needle sheath is first shortened by approximately 3 cm and placed against the index finger (Fig. 1A). It is subsequently sandwiched between two gloves on the index finger (Fig. 1B). This finger is subsequently advanced to palpate the area to be biopsied. The needle of the biopsy gun is then passed through the sheath and the tip is advanced through the glove, making contact with the prostate (Fig. 1C). The biopsy is then performed and the needle withdrawn from the sheath to release the core of tissue obtained (Fig. 1D). This can be repeated several times.

DISCUSSION

This modified biopsy technique significantly reduces the risk of injury to the patient and the operator's finger especially in cases of accidental firing of the needle, an event that is common. It has

been employed in our unit and has proven to be operator safe. We would, therefore, highly recommend this approach to other units performing finger-guided transrectal prostate biopsy.

References

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Technical Tips

Laparoscopic butterfly needle cholangiogram

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Identifying inflamed structures during a laparoscopic cholecystectomy can be difficult and siting an incision through which to place a cholangiogram tube potentially hazardous. Employing a butterfly needle can assist. The plastic 'wings' of a green (21-G) butterfly are cut off and the needle end passed, with a grasper, through an 11 mm port into the abdomen. The needle can be introduced into structures where the anatomy is unclear and aspiration of bile will confirm placement in the biliary tree. Contrast can then be injected to obtain a cholangiogram. No closure of the puncture site is necessary.

A simple technique to reduce fogging of a standard visor face mask

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Visor facemasks have become standard practice in trauma and orthopaedic surgical procedures, where there is a risk of exposure to body or lavage fluids. Standard visor masks often do not allow clear vision to the operating surgeon due to fogging of the inner surface of the mask because of poor mask ventilation. We routinely make a small, easy and safe modification to these masks by attaching a 4 cm strip of clear adhesive tape from the inferior margin of the visor to the facemask. This pulls the visor forwards away from the surgeon's forehead and allows superb mask ventilation without fogging.

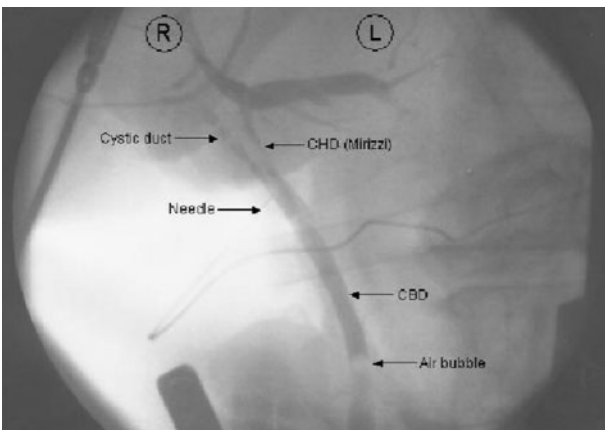


Figure 1 Cholangiogram obtained with a butterfly needle laparoscopically in a patient with acute empyema and Mirizzi syndrome.

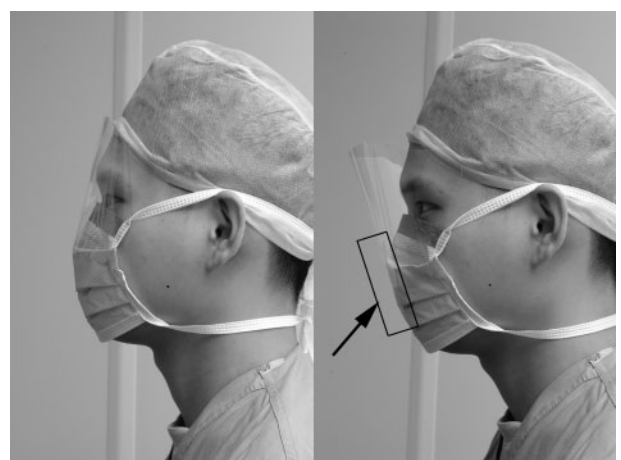


Figure 1 (A) Visor without tape; (B) visor with tape as shown by arrows and box.

Intramedullary nailing of femur – syringe to avoid soft tissue interposition while reaming

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Intramedullary nailing is the commonest fixation method for most fractures of the shaft and sub-trochanteric fractures of the femur. This procedure involves reaming the femoral medullary canal with flexible power reamers. A cobra plate is often used to prevent soft tissue interposition while reaming. This involves the assistant holding the plate while the reaming is being done. In spite of this, the soft tissue can be caught with the reamer when the reaming is being done. We have been using a novel and simple way to avoid this using a standard 20-ml syringe. The tip of the syringe is cut and shaft is cut up to the 10-ml mark. The cut syringe is introduced over the guide wire and is pushed up to the entry point on the trochanter. The reamer can be passed over the guide wire with the syringe acting as a spacer between the soft tissue and the reamer. The syringe allows the reamer to pass through it without any hindrance. This method avoids the assistant holding the cobra plate as well as preventing the soft tissues intruding while reaming.

A technique for nail avulsion using the cleaner found in hand-scrubbing packs

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Various instruments exist for nail avulsion, for example periosteal elevators, closed tips of Iris scissors, the English nail anvil or the nail elevator. These slide under the nail and prise it away from the bed. Some practitioners grasp the nail with a haemostat and pull while rocking it from side-to-side. We found that the plastic nail cleaner in the sterile hand scrubbing kits are perfectly suited for the task. These nail cleaners are readily available, cheap, disposable and do not damage the nail-bed. In years of use, we have never experienced breakage of either nail or cleaner.

A simple method for securing a surgical drain

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There are a variety of methods used for securing a drain, and one is described here that is very quick to perform and very secure, despite requiring only a single surgical tie. A silk suture is preferred, and the method begins conventionally by securing the stitch a short distance from the drain and knotted a little above the skin. The drain is then held between the two strands of the silk and one strand is looped once around the drain from outside to in and tucked underneath itself. The same is done with the other strand, making sure after the loop is made around the drain that it is tucked underneath itself so that both strands emerge below the loop that has encircled the drain. The free ends of the suture are now tied firmly as a single surgical tie, once the loops are pushed down to lie flat at the base of the drain. There is no need for multiple ties, and the drain is held very securely. This technique is illustrated in Figure 1.

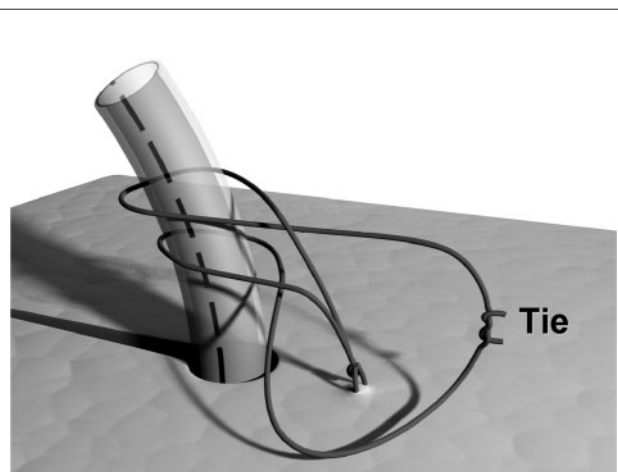


Figure 1 Quick, simple and reliable method for securing a surgical drain. The loops should be pushed down to lie flat before the knot is tied. Multiple loops or ties are not required.

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Preventing inadvertent digitations after rectal anastomoses

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Figure 1 Stickers sealed with transparent dressing on patient's buttock.

Rectal anastomoses are at risk of disruption postoperatively from inadvertently giving of rectal medicines. Disruption may arise from mechanical trauma or from the presence of the medication at the anastomosis. An anastomotic leak may result in morbidity and mortality with medicolegal consequences. Prevention of this by oral or written communications may be ineffective due to the multitude of personnel involved. Two stickers with adaptation of the 'no entry' traffic sign placed on the patient's buttocks using a water-proof transparent dressing (Fig. 1) alert potential violators to the dangers. Furthermore an alert sticker on the patient's drug chart minimises the risks.

Dynamic hip screw guide-wire placement

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Dynamic hip screw guide-wire placement is straightforward in the antero-posterior view using an angle guide. However, central placement

of the guide wire in the lateral view needs accurate interpretation of femoral neck anteversion. I recommend rotating the fluoroscopy image to show a vertical outline of the radioluscent counter-traction post. The angle the femoral neck makes with a perpendicular to this post gives the correct anteversion angle. This determines how much the drill needs to be raised or lowered to achieve central wire placement. I prefer this technique to placing a guide wire parallel and anterior to the femoral neck which can be traumatic.

Control oozing during laparoscopy with a swab

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Persistent oozing can obscure the operative field in laparoscopic surgery and diathermy/suction may fail to improve the view safely and effectively. As in open surgery, placing a swab on the oozing area often solves the problem. A 3 × 4 inch gauze swab is unfolded, held at one corner by a grasper and passed through an 11 mm port into the abdomen. After placing the swab onto the oozing area, gentle pressure can be applied with the laparoscopic instruments. Retrieval of the swab is achieved with the port by shaking it open and removing both swab and port corner first through the 11 mm skin incision.

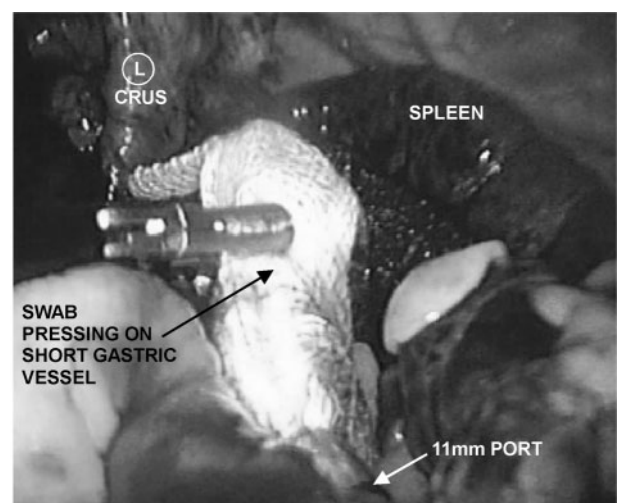


Figure 1 Pressure on haemorrhage from short gastric vessel during laparoscopic repair of large para-oesophageal hernia.