Technical Section [TECHNICAL NOTES AND TIPS

The helicopter technique: a technique for removing cold-welded titanium plates

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BACKGROUND

Titanium locking plate-screw constructs are susceptible to cold welding, which may occur when two surfaces of ductile material are forced together under substantial pressure.¹ Removal is often challenging. We describe a useful technique for removing such plates when other methods have failed.

TECHNIQUE

Following radiographic assessment (Figures 1 and 2), the surgical site is prepared and the plate fully exposed. All non-cold-welded screws are removed in conventional fashion. A high-speed carbide burr (Figure 3) is then used to cut the plate either side of the cold-welded screws. The burr removes metal, leaving a gap between the

Figure 1 Lateral radiograph of a cold-welded less-invasive stabilisation system plate – screws 1, 3 and 5 are cold welded.

Figure 2 Anterior-posterior radiograph of the same cold-welded less-invasive stabilisation system plate.

cut ends of 3–5 mm to allow removal. Constant irrigation disperses the heat generated and adjacent tissues are protected with damp swabs so debris can be easily removed. Each cold-welded screw plate section may then be removed by twisting them anticlockwise – the 'helicopter technique' (Figure 4), either by hand or with pliers. The removed plate is shown in Figure 5.

DISCUSSION

Various techniques have been previously described for removing cold-welded titanium plates, including improving the driver-screw interface with foil, using reverse threaded conical screws and removing screw heads with high speed burs.^{1,2} Our technique has the following advantages: the surgeon need not break the cold weld around the screw; all pieces of plate can be removed; the screws are never

Figure 3 An example of a high-speed burr.

Figure 4 The 'helicopter technique' is used to remove each section of the plate.

Figure 5 The segmented plate with cold-welded screws retained in the proximal end and the distal locking screws replaced for illustrative purposes only.

retained; and there is no damaged equipment. Disadvantages include: having to perform a fully open procedure; and the generation of heat and debris (minimise with use of wash and soft-tissue protection).

References

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2. Kumar G, Dunlop C. A technique to remove a jammed locking screw from a locking plate. *Clin Orthop Relat Res* 2011; **469**: 613–616.

Improved ‘suture passer’: an easy and cost-effective tool for transcorporeal suturing

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Traditional ‘suture passers’ may be difficult to manoeuvre at some intra-abdominal locations due to their weight and rigidity. We describe an improvised suture passer, made of a 16G intravenous

cannula needle with a loop of polypropylene thread passed through it (Figure 1).¹ This featherweight tool can bring out thread from any corner of the abdomen through a needle prick only. After piercing through the peritoneal cavity, a gentle upward pull on the needle opens up the polypropylene loop for holding the thread. The accompanying video demonstrates the technique.

Reference

1. Tammy LO, Tindall A. Improved straight needle suture passer. *Ann R Coll Surg Engl* 2010; **92**(2): 172.

Technique for contouring the cut end of infix bars and external fixator pins

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Background

Anterior subcutaneous pelvic fixation (infix) achieves bony stabilisation of unstable pelvic fractures, and is considered for rotational or vertically unstable fractures requiring operative intervention (Figure 1).^{1,2} The infix bar is cut to size with sterile heavy cutters. This leaves one end of the rod on the cut surface sharp to touch (Figure 2a). We believe that contouring the cut end of the rod to a smooth rounded edge allows a more benign environment for surrounding tissue to heal (Figure 2b,c). Sharp surfaces are also

Figure 1 Improved suture passer.

Figure 1 Anterior subcutaneous pelvic fixation (infix) for pelvic fracture, sacroiliac screw posteriorly.