Acta Orthop. Belg., 2011, **77**, 541-542

TECHNICAL NOTE

Paper and dynamic hip screw surgery – A cheap and effective aid for hip fracture reduction

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The reduction of hip fractures prior to using dynamic hip screw devices can be challenging. The use of folded paper recreates an optimal angle of 135 degrees to assess adequacy of hip fracture reduction and to alert the surgeon as to the precise entry point of the guidewire in the lateral cortex of the femur.

Keywords : proximal femur fracture ; dynamic hip screw ; technical tip.

INTRODUCTION

Most cases of hardware failure following Dynamic Hip Screw (DHS) surgery for intertrochanteric hip fractures are due to screw cut-out (*2*). A 'tip-apex' distance greater than 25 mm is accepted as a strong predictor of screw cut-out in patients treated by DHS (*1*). To ensure optimum screw placement and tip-apex distance therefore, satisfactory reduction of the neck-shaft angle for a trainee can prove challenging but is a crucial step. This is usually done with the affected leg in a holster on the fracture table, using a combination of movements including traction, ab- or adduction and internal or external rotation.

Technique

Most DHS devices use a standard 135-degree jig for guidewire placement and a 135-degree angle between the lag screw and the plate.

An intial attempt at reduction of the hip is made (Fig. 1). A piece of paper folded onto itself can create an angle of 135 degrees. When viewed in portrait, the top corner of the paper is folded exactly so it meets the opposite side, forming a 135 degree angle as shown in Fig. 2. Using the image intensifier, the paper can then be placed on the screen of the monitor, overlying the lateral cortex of the femur so the apex of the paper bisects the centre of the femoral neck and head as shown on the fluoroscopy screen. This allows the surgeon to assess the adequacy of his reduction on the AP view to ensure he has maintained a neck-shaft angle of 135 degrees. The ideal entry point for the guidewire on the lateral cortex of the femur can also be identified (Fig. 2). This will also allow the trainee to ensure an adequate tip-apex distance with placement of the DHS wire.

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No benefits or funds were received in support of this study

Fig. 1. — A typical intertrochanteric fracture, as seen on the fluoroscopy screen.

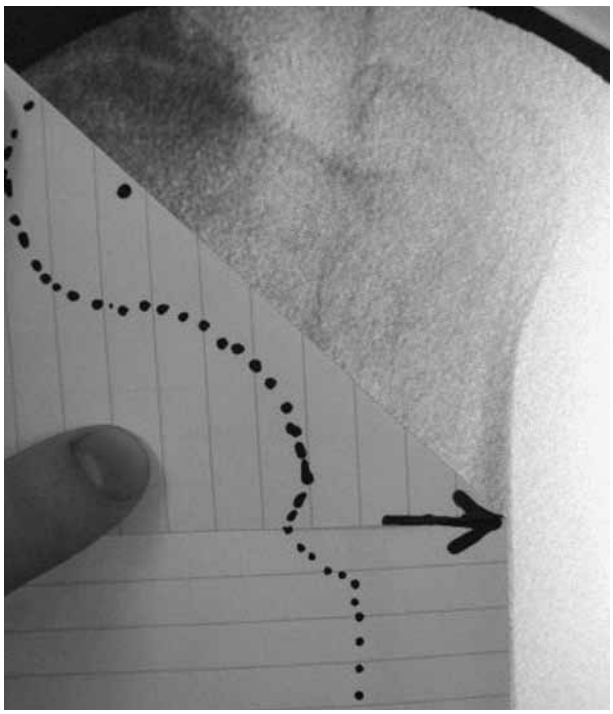

Fig. 2. — A paper sheet which has been folded so as to generate a 135° angle is placed over the fractured proximal femur on the fluoroscopy screen, to show the optimal position into which the guidewire should be positioned, as well as the desired point of introduction.

In our department this technique has improved adequacy of hip fracture reduction, and reduced the number of passes needed to ensure correct positioning of the DHS guidewire. We believe this has improved radiological tip-apex distances on post-operative radiographs and may reduce screw cut-out on further follow-up.

DISCUSSION

Ensuring adequate hip fracture reduction prior to DHS surgery can be a challenge for the trainee. A simple, cheap aid using a folded piece of paper to recreate the optimum neck-shaft angle takes little time to create and is a reliable, reproducible tool for the trainee.

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