

Publication

A new technique for cement augmentation of the sliding hip screw in proximal femur fractures

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BACKGROUND: Fractures of the osteoporotic proximal femur are a significant source of mortality and morbidity in today's ageing population. Even with modern fixation techniques such as the sliding hip screw, a certain percentage of fixations will fail due to cut-out of the screw. This study presents a new method for augmenting hip screws with cement to reinforce the fixation. **METHODS:** Unstable pertrochanteric fractures were created in paired osteoporotic cadaver femora (n=10). The fractures were fixed using either standard fixation techniques (dynamic hip screw), or using a dynamic hip screw augmented with cement. Cement was introduced using a customised jig to guide cement into a region superior to the screw in the femoral head. Cut-out resistance was assessed using a biaxial material testing machine, with loading applied in compression until failure. **FINDINGS:** The new cement augmentation technique significantly improved the cut-out strength of the fixation (mean 42%; P=0.032). The failure mechanism for both groups was the same, with failure occurring through compression of the cancellous bone superior to the screw. The mean increase in temperature at the femoral neck was 3.7 degrees C in augmented bones, which is much lower than values previously reported for polymethylmethacrylate cements. **INTERPRETATION:** Several benefits with this technique have emerged. The method is technically straightforward. The risk of cement penetration into the joint is reduced, and cement is targetted to the areas of the femoral head where it is most needed. The exothermic reaction is minimised by reducing the volume of cement used. The first clinical results are promising.

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