Paper - International

Paper Session: Geriatric

Screw-Calcar Related Tip-Apex Distance Is the Most Reliable Indicator for Compression Hip Screw Failure

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Purpose: With an exponentially aging population, the incidence of annual hip fractures is predicted to steadily rise. These fractures regardless of anatomic configuration are associated with high morbidity and 30-day mortality; as such, failure of fixation and the need for subsequent revision can be catastrophic for patient outcomes. Intertrochanteric fractures are amenable to fixation with dynamic/compressive hip screws (CHSs); historically it has been accepted that a combined AP/lateral tip-apex distance (standard TAD) above 25 mm was a fair predictor of failure, while more recent analysis of intramedullary devices suggests calcar-screw related TAD is a better predictor of cut-out compared to standard TAD. As such, this study examines the significance of calcar-screw distance as a predictor of cut-out in extramedullary fixation devices for extracapsular hip fractures

Methods: We retrospectively reviewed 198 consecutive fractures that had undergone dynamic hip screws for an intertrochanteric neck of femur fracture in a 24-month period. Of these, 108 met the inclusion criteria of a nonpathological fracture with a minimum 60-day radiological follow-up (mean 77 days; range, 60 days to 23 months). Intraoperative images were used to calculate screw-calcar distance on the AP film as well as TAD on both the AP and lateral. Failure was defined as radiological cut-out of the screw from the femoral head.

Results: The overall failure rate was 6.5% (7 of 108), mean combined screw-calcar distance on the AP + TAD on the lateral was 24.1 ± 11.1 compared to standard AP + lateral TAD of 21.8 ± 18.6. In those that cut out, failure was significantly associated with an increased screw-calcar related TAD (mean 36.1 ± 4.9; $P < 0.04$), whereas mean standard TAD in this group was 23.9 ± 1.6. In all 108 patients reviewed, of those with a standard TAD above 25 mm but a screw-calcar related TAD below 30 mm (68/108), no failures were noted; as such an increased standard TAD alone was not significantly associated with failure ($P < 0.07$).

Conclusion: Our data suggest that screw-calcar related TAD is a more effective predictor of failure than standard TAD alone and, as such, may be beneficial intraoperatively when determining screw placement.