Predictors of Failure for Cephalomedullary Nailing of Proximal Femoral Fractures

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Purpose: The purpose of this study was to identify factors that predict cut-out in cephalomedullary nailing of intertrochanteric and subtrochanteric hip fractures, and to test the significance of calcar-referenced tip-apex distance (CalTAD) as a new predictor for cut-out.

Methods: All patients who underwent cephalomedullary nailing for an intertrochanteric or subtrochanteric fracture between 2003 and 2013 were retrospectively reviewed. Pertinent data were extracted from chart reviews, and from radiographical images at time of diagnosis, immediately postoperatively, and at last follow-up.

Results: 170 consecutive patients underwent cephalomedullary nailing during the period studied. Of those, 77 patients met the inclusion criteria of a nonpathologic fracture with a minimum 80 days radiographic follow-up (average 408 days). Ten cut-outs (13.0%) were identified. Univariate analysis found TAD, CalTAD, cervical angle difference, and lag screw placement in the AP view (Parker's ratio index) as significant ($P < 0.01$). Age, gender, fracture side, fracture type (AO classification), Singh osteoporosis index, lag screw placement in the lateral view, and reduction quality (modified Baumgaertner's method) were not significant ($P > 0.01$). In the multivariate analysis, CalTAD was the only significant parameter ($P = 0.001$). CalTAD had an almost-perfect interobserver reliability (intraclass correlation coefficient [ICC] = 0.901).

Conclusion: Our data provide the first reported clinical evidence for CalTAD as a risk factor for cut-outs. The findings of CalTAD as the only significant parameter in the multivariate analysis, along with the univariate significance of Parker's ratio index in AP view, suggests that a more inferior placement of the lag screw is preferable for reduced cut-out rates.

- The FDA has not cleared this drug and/or medical device for the use described in this presentation (i.e., the drug or medical device is being discussed for an "off label" use). For full information, refer to page 600.