

Positioning of Dynamic Hip Screw as a Predictor of Implant-Failure Following Fracture Neck of Femur: A Survival Analysis of 10 Years

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Surgical fixation of fractures of the extracapsular neck of the femur (ENoF) with a dynamic hip screw (DHS) is a standard procedure performed. The position of DHS is considered a crucial determinant of fracture stability and healing. Minimal studies were found in the literature on the positioning of DHS as a predictor of implant failure. The study assessed the predictive value of the surgical position of DHS on implant failure, measured utilizing radiological parameters. A descriptive longitudinal study was conducted on a cohort of patients (n=514). The surgical outcomes of implant-failure and non-failure groups were assessed in the 2nd, 5th, and 10th postoperative years. Radiological parameters were assessed and compared between the two groups. The null hypothesis was tested using the Wilcoxon rank-sum test. TAD (AP/Lat), TSDAP (AP/Lat) and NSA (AP) distances were significantly higher ($p < 0.000$) in the implant-failure group (n=259) in comparison to the non-failure group (n=255). Statistically significant differences in the radiological variables were found between the two groups $z = -19.7$, $\text{Prob} > z = 0.0000$. TAD, TSD (AP), TSD (Lat) and NSA (AP) were predictive of implant failure. Standardized coefficients regression indicated that the most important variables for predicting implant failure are TSDL at (-0.110) and TSDAP (-0.067). The position of the DHS is concluded to be a critical determinant of the implant's stability and survival. TSD (Lat) and TSD (AP) predicted implant failure. Femur neck screw position in the central zone in the lateral view and the central zone or central inferior zone screw placement in the anterior view did not associate with implant failure.

Keywords: *fracture neck of femur, Dynamic Hip Screw (DHS), implant failure, radiological parameters of DHS position*