Distal Femoral Fracture Fixation: Locking Plates Vs. Retrograde Nails

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Introduction: Contemporary fixation of distal femoral fractures (DFFs) mostly refers either to retrograde intramedullary nailing or locking plate fixation. However, thus far there has been limited comparative evidence as to the outcome and complications of these different fixation techniques. The aim was to define the midterm clinical and functional outcome of DFFs treated with retrograde nailing versus locked plating.

Methods: Retrospective comparative analysis of consecutive patients treated in a single Major Trauma Centre within the last decade following a distal femoral fracture. Patients younger than 16 years and pathologic fractures were excluded. Demographics, comorbidities, associated trauma and surgeries, transfusion requirements, the AO/OTA classification system, Injury Severity Score (ISS), Charlson co-morbidities Score (CCS), complications and functional outcome as measured according to the Oxford Knee Score (OKS) over a minimum period of follow up 15 months, were collected and analyse. Descriptive statistical methods, and non-parametric statistical tests were utilised in-between matched subgroups according to the fracture pattern, as well as by excluding those with other severe lower extremity/spinal trauma.

Results: The group totalled 128 patients (39 males) with an average age of 71 years (20-96). 63 retrograde nails, and 65 locking plates were implanted. Statistically the groups have similar age profile, gender, and CCS. The average ISS for the retrograde nail group was 10 and 9 for the plate group. The proportion of other injuries in addition to the DFF was 6% in the plate group and 18% in the retrograde nail group (p=0.04).

Comparing the perioperative factors, the operative time was similar between the two groups (plates 159 min (75-270), and retrograde nail 146 min (90-285)). Following the exclusion of polytrauma patients, no statistical difference was identified between the 2 groups as to the peri/postoperative transfusion, length of postoperative stay, or length of follow up. The average follow up was 4.9 years (1.4-9.8). The average Oxford Knee Score for the plating group was 39 compared to the retrograde nailing group which had a score of 24 (<p=0.01). Less functional deficit was demonstrated in those patients treated with plates compared to retrograde nail. Statistically, the subgroups of patients with diabetes or who smoked, did not do significantly worse in terms of function with either fixation.

Secondary surgeries were more frequent to the nailing fixation (17%) compared to the 6% in the plating group (<p=0.01), with the proportion of patients who smoked higher in both these groups. The principle need for intervention in the retrograde nail group was non-union, prominent metalwork, and nail failure, whereas for plates the need arose from non-union. The average RUST score at 18 (+/- 1) week for both group was similar, a score of 11 for the retrograde nails and 10.2 for the plates. The rate of local and systemic complications was similar at 14-15%.
Discussion: This work, with the inherent limitation of a retrospective case series, demonstrated favourable outcome of distal femoral fractures treated with a locking plate in comparison to those treated with a retrograde intramedullary nail and highlights the need for further studies of higher level of evidence.

Significance: This is one of the longest retrospective studies of these two types of fixation.

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