

Flexible Versus Rigid Nailing of Femur Fractures in 8- to 12-Year Olds: Where Are We Now?

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Purpose: Patient age, weight, and fracture pattern are often considered when treating pediatric femur fractures. Recent studies with stainless steel flexible nails have demonstrated improved outcomes in older and larger children than titanium flexible nails. Conversely, options for rigid nails are increasing, making them available for use in younger and smaller patients. The aim of this study was to compare patient variables, surgical variables, and outcomes in patients aged 8 to 12 years treated with either rigid or flexible nailing of their femur fractures.

Methods: A retrospective review from January 2011 to June 2019 of operatively treated femur fractures was performed at a Level-I pediatric trauma center. Patients aged 8 to 12 years, treated with either flexible or rigid nailing, were included. Demographic data, radiographic measurements, operating room (OR) time, length of stay, associated injuries, and complications were collected. Standard statistical measurements were employed.

Results: There were 49 patients in the rigid nail group and 66 in the flexible nail group. The rigid nail group was significantly older (average 10.5 vs 9.7 years) and heavier (average 47 vs 36.4 kg) than the flexible nail group. Flexible nailing resulted in significantly shorter OR time, fluoroscopy time, and less estimated blood loss. Patients in the rigid nail group were significantly more likely to be obese and were allowed to weight-bear earlier. There was no difference in length of stay, mechanism of injury, associated injuries, time to radiographic healing, fracture pattern, or total complications. There were 14 complications in the flexible nail group including 1 infection, 1 loss of reduction requiring revision to rigid nail, and 3 additional unplanned trips to the OR for hardware prominence. There were 6 complications in the rigid nail group, including 1 trochanteric growth arrest after nail placement and subsequent removal.

Conclusion: This is the largest series comparing these 2 treatment methods for femur fractures in the preadolescent age group. The flexible nail cohort had shorter OR time, fluoroscopy time, and less blood loss. The rigid nail group was more likely to be obese. Complication rates were similar in both groups but included 4 unplanned trips to the OR in the flexible nail group and 1 trochanteric growth arrest in the rigid nail group. With increasing options for femur fracture fixation in the pediatric population, this data can be used for surgical decision making and counseling families.