

Dynamic Femur Fracture Brace vs Spica Cast for Pediatric Femoral Shaft Fractures

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INTRODUCTION: Femoral shaft fractures are the leading cause of pediatric orthopedic hospitalization. The dynamic femur functional brace offers a potential alternative to traditional spica casting, which, while effective, has challenges. This study compares outcomes and complications between the dynamic femur brace and spica casting in the management of pediatric femoral shaft fractures.

METHODS: A retrospective matched cohort study analyzed 42 patients aged 1-5 years with diaphyseal femur fractures (OTA 32) treated between September 2021 and August 2024. Twenty-one patients treated with the dynamic femur brace were matched with 21 spica cast patients based on age, weight, and fracture characteristics. Primary outcomes included fracture union, time to weight-bearing, and radiographic alignment. Secondary outcomes encompassed hospital admission rates, length of stay, and complications.

RESULTS: Demographics were similar between groups (mean age 2.3 years, 78.6% male). Hospital admission rates were significantly lower in the dynamic femur brace group (33.3% vs 71.4%, $p=0.013$) with shorter mean length of stay (0.33 vs 1.10 days, $p=0.015$). Notably, 95.2% of spica cast patients required an operating room compared to none in the brace group. All fractures achieved radiographic union at 6 weeks, with similar time to brace/cast removal and weight-bearing (brace: 40.9 days, Spica: 40.1 days, $p=0.715$). Changes in angulation from initial to final radiographs were similar between groups in both planes. The brace group experienced more emergency department returns (3 vs 1), while the spica group had two cases of skin breakdown.

DISCUSSION AND CONCLUSION: The brace demonstrated comparable union rates and alignment to spica casting while reducing hospital admissions, length of stay, and need for operative intervention. Although the brace group had more unplanned emergency department visits, the overall complication profile was similar between groups. These findings suggest the brace represents a viable alternative for pediatric femoral shaft fractures, potentially optimizing healthcare resource utilization without compromising treatment efficacy.