In Situ Screw Fixation for Stable Slipped Capital Femoral Epiphysis is Safely Treated in Both Inpatient and Outpatient Settings

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INTRODUCTION: Patients diagnosed with slipped capital femoral epiphysis (SCFE) are usually admitted and treated with screw stabilization as quickly as possible to prevent development of an unstable or worsened slip. In the modern quality and value healthcare environment, prevention of unnecessary inpatient hospital admissions is ideal. This study compares the safety of SCFE stabilization in an inpatient (admitted and pinned same hospital stay) versus outpatient (pinned and discharged on same but separate day from diagnosis) setting.

METHODS: A retrospective review of all stable SCFEs treated at 2 level 1 pediatric trauma centers from 2010 to 2018 with a minimum follow up of 12 months was performed. Comparisons were made between patients stabilized as an inpatient or an outpatient. General demographics were collected along with slip severity as determined by Southwick angle on anteroposterior (AP) and lateral hip radiographs at 5 separate timepoints. Outcomes assessed included postoperative complications (e.g., infection, avascular necrosis, chondrolysis), slip angle progression, need for revision screw fixation (due to slip progression, growth off screw, symptomatic hardware), and symptomatic femoroacetabular impingement (FAI) requiring further, or planned for, surgical intervention. Independent t-test was used to evaluate quantitative variables, chi-squared test for qualitative variables, and logistic regression for differences between severity groups. P-values <0.05 were considered significant.

RESULTS: A total of 171 SCFEs in 140 patients (92 inpatient, 52 outpatient) were reviewed. In total, 108 were stabilized as an inpatient and 63 as an outpatient. Table 1 reports the patient demographics between the groups including slip severity, need for revision surgery, other complications, and residual symptomatic FAI. Outside of age at time of stabilization, there were no significant differences between the groups including overall complications (p=0.1705) or need for revision surgery (p=0.1657). There was a significant difference for initial Southwick AP and lateral angles at time of diagnosis between inpatient and outpatient groups (p=0.0493 and 0.0310 respectively). Despite this, AP angles did not significantly change over time between groups (p=0.3548). Lateral angles did progress 2.4 degrees from time of diagnosis to final follow up in all SCFEs (p=0.0028) but were not significantly different between inpatient or outpatient groups (p=0.0981). If a complication occurred, there was a 4.7 times higher odds for a greater slip severity (p=0.0170). As expected with the natural history of more severe SCFEs, patients with symptomatic FAI had a 3.3 times higher odds to have a greater slip severity (p=0.0012). Inter-rater reliabilities for Southwick angles were good or excellent across all time measurements (ICC ≥0.8).

DISCUSSION AND CONCLUSION: Screw stabilization for stable SCFEs can be safely performed in both inpatient and outpatient settings, limiting the need for unnecessary inpatient admissions and ultimately, decreasing overall hospital care costs. This is predicated on a system that can ensure expedient SCFE stabilization within a reasonable time period and close patient follow up between diagnosis and screw fixation.

Table 1: Group Demographics

Characteristic	Overall N=171	Inpatient N=108	Outpatient N=63	P-Value
Age (years)	11.8 ± 1.7	12.0 ± 1.7	11.5 ± 1.5	0.0334
Sex (Male %)	96 (56.1)	63 (58.3)	33 (52.4)	0.4492
BMI (kg/m²)	28.3 ± 5.4	28.8 ± 5.9	27.6 ± 4.4	0.1878
Race (%)				
White	87 (51.5)	50 (47.2)	37 (58.7)	
African American	71 (42.0)	49 (46.2)	22 (34.9)	0.2559
Hispanic	8 (4.7)	6 (5.7)	2 (3.2)	
Other	3 (1.8)	1 (0.9)	2 (3.2)	
Bilateral (%)	51 (36.4)	29 (26.9)	22 (34.9)	0.2659
Side Pinned (%)				
Left	86 (50.3)	58 (53.7)	28 (44.4)	0.2427
Right	85 (49.7)	50 (46.3)	35 (55.6)	
Slip Severity (Δ from contralateral side)				
Mild (<30°)	118 (69.0)	72 (66.7)	46 (73.0)	
Moderate (30-50°)	155 (21.6)	23 (21.3)	14 (22.2)	0.2867
Severe (>50°)	16 (9.4)	13 (12.0)	3 (4.8)	
Complications (%)				
Infection	0 (0.0)	0 (0.0)	0 (0.0)	.
Revision Surgery	15 (8.8)	7 (6.5)	8 (12.7)	0.1657
AVN	6 (3.5)	4 (3.7)	2 (3.2)	1.0
Other	11 (6.4)	9 (8.3)	2 (3.2)	0.3322
Total Complications (%)	22 (12.9)	11 (10.2)	11 (17.5)	0.1705
Symptomatic Femoroacetabular Impingement (%)	38 (22.2)	28 (25.9)	10 (15.9)	0.1272