

# Obesity Increase the Risk of Post-operative Complications in Patients with Slipped Capital Femoral Epiphysis: A Nationwide Analysis of Surgical Outcomes and Risk Factors

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## INTRODUCTION:

Slipped Capital Femoral Epiphysis (SCFE) is a common hip disorder in adolescents and a leading cause of early hip degeneration. Despite its clinical significance, national data on risk factors and surgical outcomes remain inconsistent. Although obesity is linked to increased surgical complexity and a higher risk of bilateral disease, its direct effect on postoperative complications such as avascular necrosis (AVN) remains unclear. To address these uncertainties, this study aims to address two key questions: 1) What are the surgical approaches and associated complication rates? 2) How does obesity impact surgical outcomes in patients with SCFE?

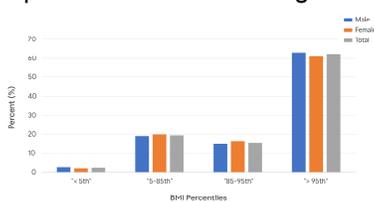
**METHODS:** A retrospective analysis was conducted using the M170Ortho dataset from the PearlDiver Patient Records Database, spanning 2010 to 2022. Surgical outcomes and complications were assessed in patients aged 9 to 16 who underwent in situ pinning or open treatment with at least two years of follow-up. Patients were stratified into obese and non-obese groups based on whether their body mass index (BMI) was above or below the 95th percentile. Postoperative outcomes—including hip avascular necrosis (AVN), hip fracture, second surgery, surgical site infection (SSI), and femoral limb length discrepancy (LLD)—were compared between groups. Statistical analyses included chi-squared tests for categorical variables and logistic regression to adjust for confounders such as age, sex, insurance status, geographic region, and study year.

## RESULTS:

Among 33,885 SCFE cases identified from 2010 to 2022 in the United States, males exhibited a 70% higher incidence rate than females (3.0 vs. 1.75 per 100,000), with the highest rates observed in ages 10–14 years, followed by 15-19 years. Most of the patients were obese, with 62.5% having a BMI exceeding the 95th percentile (Figure 1). Of 5,220 surgical cases with adequate follow-up, 4,363 (83.6%) underwent in situ pinning and 857 (16.4%) had open treatment. Secondary surgery and hip fracture were the most frequent complications in both groups (17.9% and 10% for in situ pinning; 23% and 14.7% for open treatment). Obese patients experienced higher complication rates across both surgical modalities. The incidence of hip AVN and second surgery was significantly greater in the obesity group: 3.2% vs. 2.1% ( $p = 0.043$ ) and 19.0% vs. 16.5% ( $p = 0.037$ ) for in situ pinning (Table 1), and 10.7% vs. 5.3% ( $p = 0.005$ ) and 26.1% vs. 20.0% ( $p = 0.039$ ) for open treatment (Table 2). After adjustment for confounders, obesity independently predicted hip AVN (OR 1.62, 95% CI: 1.089–2.452) and femoral LLD (OR 1.49, 95% CI: 1.031–2.190) following in situ pinning. In patients undergoing open treatment, obesity significantly increased the risk of hip AVN (OR 2.03, 95% CI: 1.201–3.500).

## DISCUSSION AND CONCLUSION:

This study identified obesity as a key factor in SCFE incidence and postoperative complications. Over 60% of patients were obese, exhibiting higher rates of hip AVN, secondary surgeries, and femoral LLD. Obesity remained an independent predictor of these outcomes even after adjustment for confounders. These results highlight the critical need for early identification and management of obesity in SCFE patients, as addressing this modifiable risk factor may substantially improve surgical outcomes and reduce complications.



**Table 1. Overview of Complications in Obese vs. Non-Obese Patients with SCFE Undergoing In-Situ Pinning.**

Complication	Total	Obese	Non-Obese	OR	P-value	Adjusted OR	Adjusted P-value
Hip Fracture	438 (8.0%)	268 (18.7%)	170 (9.2%)	1.87 (0.976–3.453)	0.107	1.165 (0.674–1.649)	0.090
Hip AVN	118 (2.7%)	79 (3.2%)	39 (2.1%)	1.516 (1.028–2.235)	<b>0.043*</b>	1.62 (1.089–2.452)	<b>0.019*</b>
Second Surgery	762 (17.9%)	476 (19%)	286 (16.5%)	1.17 (1.014–1.390)	<b>0.037*</b>	1.17 (1.072–1.285)	0.101
SSI within 90 days	23 (0.5%)	17 (0.7%)	6 (0.3%)	2.169 (0.628–7.590)	0.165	2.237 (0.688–7.427)	0.165
Femoral LLD	138 (3.1%)	88 (3.7%)	50 (2.8%)	1.770 (0.959–3.190)	0.089	1.495 (1.031–2.190)	<b>0.030*</b>

Abbreviations: SCFE = Slipped Capital Femoral Epiphysis, OR = Odds Ratio, AVN = Avascular Necrosis, SSI = Surgical Site Infection, LLD = Limb Length Discrepancy.  
\* A p-value of less than 0.05 was considered indicative of statistical significance.

**Table 2. Overview of Complications in Obese vs. Non-Obese Patients with SCFE Undergoing Open Treatment.**

Complication	Total	Obese	Non-Obese	OR	P-value	Adjusted OR	Adjusted P-value
Hip Fracture	126 (14.7%)	71 (14.9%)	55 (12.6%)	1.405 (0.960–2.057)	0.097	1.274 (0.864–1.880)	0.224
Hip AVN	61 (7.9%)	41 (10.7%)	20 (5.3%)	2.149 (1.276–3.620)	<b>0.005*</b>	2.025 (1.201–3.500)	<b>0.009*</b>
Second Surgery	197 (23%)	119 (26.1%)	77 (20%)	1.419 (1.094–1.954)	<b>0.039*</b>	1.368 (0.914–1.965)	0.144
SSI within 90 days	11 (1.3%)	9 (1.9%)	2 (0.7%)	2.766 (0.757–10.011)	0.265	2.664 (0.671–13.572)	0.128
Femoral LLD	46 (4.7%)	18 (4.3%)	28 (7.8%)	0.841 (0.441–1.591)	0.710	0.990 (0.478–2.065)	0.993

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\* A p-value of less than 0.05 was considered indicative of statistical significance.