

# Impact of Obesity on Surgical Outcomes in Pediatric Lower Extremity Fractures: A Propensity Matched Cohort Study

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## INTRODUCTION:

The impact of obesity on the outcomes of surgically treated pediatric fractures of the lower extremity remains poorly understood. This study aims to evaluate the influence of obesity on the surgical outcomes of pediatric patients with fractures of the femur and tibia/ankle, focusing on complications such as infection, wound dehiscence, return to the operating room (OR) or revision surgery, and nonunion over a one-year follow-up period.

## METHODS:

A large national database in the United States was queried. This retrospective cohort study analyzed data from pediatric patients who underwent surgical treatment for femur and tibia/ankle fractures between January 2003 and March 2023. The cohort was stratified into obese and non-obese groups for each fracture location used BMI-percentiles. A total of 41,226 patients were identified, with 840 patients matched 1:1 in the femur cohort and 788 patients matched 1:1 in the tibia/ankle cohort. Outcomes were compared using risk ratios and statistical significance was assessed.

## RESULTS:

Among femur fractures, obese patients exhibited higher rates of wound dehiscence (2.74% vs. 1.31%, RR 2.09, p=0.06), return to OR/revision surgery (10.00% vs. 3.10%, RR 3.23, p<0.001), and nonunion (3.10% vs. 1.31%, RR 2.00, p=0.02) compared to their non-obese counterparts. Infection rates were similar between the groups (1.67% vs. 1.55%, RR 1.08, p=1.00). For tibia/ankle fractures, obese patients had significantly higher rates of infection (1.65% vs. 1.27%, RR 1.30, p<0.001), wound dehiscence (2.66% vs. 1.27%, RR 2.10, p<0.001), return to OR/revision surgery (11.29% vs. 1.40%, RR 8.09, p<0.001), and nonunion (3.05% vs. 1.40%, RR 1.90, p=0.04).

**DISCUSSION AND CONCLUSION:** Obese children undergoing surgery for these fractures are at a higher risk for wound dehiscence, return to OR/revision surgery, and nonunion, with tibia/ankle fractures also showing higher infection rates. These findings emphasize the need for careful preoperative assessment and postoperative management in obese pediatric patients to mitigate these risks.

Pediatric Surgically Treated Lower Extremity Fractures (41,226)		
Characteristics	N or Mean	SD or %
Age	10.26	5.13
BMI Percentile	67.11	31.89
Male	23042	55.89%
Female	14568	35.34%
Black	6704	16.26%
White	23792	57.71%
Unknown Race	5758	13.97%
Hispanic or Latino	4780	11.59%

Femur (840)								
Variable	OB-Femur	NotOB-Femur	OB-Femur Proportion	NotOB-Femur Proportion	Risk Ratio	LB	UB	P-Value
Infection	14	13	1.67%	1.55%	1.08	0.75	1.55	1.00
Wound Dehiscence	25	11	2.98%	1.31%	2.27	1.82	2.84	0.03
Return to OR / Revision	84	26	10.00%	3.10%	3.23	2.88	3.63	0.00
Nonunion	26	11	3.10%	1.31%	2.36	1.91	2.93	0.02
Tibia/Ankle (788)								
Variable	OB-Tibia/Ankle	NotOB-Tibia/Ankle	OB-Tibia/Ankle Proportion	NotOB-Tibia/Ankle Proportion	Risk Ratio	LB	UB	P-Value
Infection	13	10	1.65%	1.27%	1.30	0.91	1.87	0.68
Wound Dehiscence	23	10	2.92%	1.27%	2.30	1.83	2.90	0.03
Return to OR / Revision	89	11	11.29%	1.40%	8.09	7.41	8.83	0.00
Nonunion	24	11	3.05%	1.40%	2.18	1.73	2.75	0.04