Pediatric Supracondylar Humerus Fractures: Does After-hours Treatment Influence Outcomes?

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Purpose: Pediatric supracondylar humerus fractures are common and, when displaced, require surgical reduction and fixation. Surgery frequently occurs outside of normal operating hours. This may be suboptimal due to factors such as surgeon fatigue, limited hospital resources, and variation in surgeon comfort with pediatric fracture care. This study compared the outcomes of pediatric supracondylar humerus fractures treated during daytime operating room hours to those treated after hours.

Methods: We retrospectively reviewed the charts of 195 pediatric patients treated with surgical reduction and pinning of closed supracondylar fractures at one institution. Patients were divided into two groups. 59 patients underwent surgery during daytime hours, defined as a surgery start between 06:00 and 15:59 on weekdays. 136 patients underwent surgery after hours, defined as surgery start between 16:00 and 05:59 on weekdays or any surgery on weekends. Demographics, surgeon subspecialty, operative time, complications, and clinical outcomes were extracted from the patient medical records. Radiographs were assessed for injury classification and quality of reduction. Statistical analysis was performed using $\chi 2$, Fisher exact test, Student t test and logistic regression.

Results: There were no significant differences in demographics between the daytime hours and after-hours patient groups. Surgery performed during daytime hours was more likely to be performed by a pediatric orthopaedic surgeon than after-hours surgery (93% vs 49%, $P < 0.001$). Fractures treated with after-hours surgery had more severe injury patterns with 74% classified as Gartland Type III compared to 54% in the daytime hours group ($P = 0.007$). After controlling for injury pattern and surgeon fellowship training, after-hours operations were not independently associated with increased operative times (odds ratio 1.2, 95% CI 0.5-2.7, $P = 0.48$). There were no significant differences between groups in terms of need for open reduction, complications, range of motion, or radiographic alignment at final follow-up.

Conclusion: After-hours surgical treatment of pediatric supracondylar humerus fractures is more likely to involve Gartland Type III fracture patterns, but is less likely to be performed by a fellowship-trained pediatric orthopaedic surgeon when compared to daytime surgery. There is no difference in operative times or outcomes following surgical treatment of pediatric supracondylar humerus fractures performed outside of normal operating room hours when compared to surgery performed during daytime hours. Supracondylar humerus fractures can be treated after hours without increased risk. These data can better inform surgeons who must decide how and when to treat these fractures.

See pages 49 - 106 for financial disclosure information.