Complications with Surgical Treatment of Pediatric Supracondylar Humerus Fractures: Does Surgeon Training Matter?

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Purpose: National trends reveal increased transfers to referral hospitals for surgical management of pediatric supracondylar humerus (SCH) fractures. This is partially due to the belief that pediatric orthopaedic surgeons (POs) will have better outcomes compared to non-pediatric orthopaedic surgeons (NPOs). We compared outcomes of operatively treated SCH fractures between POs and NPOs at a single tertiary care center where both groups cover primary call for pediatric fractures.

Methods: Patients age 3 to 10 years undergoing operative treatment of SCH fractures from 2014 to 2020 were included. Patient demographics and perioperative details were recorded. Radiographs at surgery and short-term follow-up assessed quality and maintenance of reduction. Primary outcomes were major loss of reduction (MLOR) and iatrogenic nerve injury (INI). Secondary outcomes included overall complications, reoperation, quality of pin construct, need for open reduction, and surgical time.

Results: 311 fractures were reviewed, including 103 Gartland type 2, 170 type 3, 28 modified Gartland type 4, and 10 flexion type. POs performed 132 cases, and NPOs performed 179 cases. The rate of MLOR was 1.5% among POs and 2.2% among NPOs ($P = 1$). The rate of INI was 0% among POs and 3.4% among NPOs ($P = 0.041$). All nerve palsies resolved at mean 13.1 weeks postoperatively. Rates of reoperation, infection, and readmission were not significantly different among PO and NPO groups. Rates of open reduction were also similar (3.8% vs 4.5%). Operative times were decreased with POs compared to NPOs (38.1 vs 44.6 minutes; $P = 0.030$). Pin constructs were graded as higher quality in the PO group, having a higher mean pin spread ratio ($P = 0.029$), a lower rate of "C" grade (only 1 column engaged with pins; $P = 0.010$), and less frequent crossed-pin technique (9.8% vs 32.4%; $P<0.001$). The NPO group took significantly more cases to the operating room overnight (21.2%) compared to the PO group (3.8%) ($P<0.001$). Multivariate analysis revealed positive associations for operative time with MLOR (odds ratio [OR] = 1.021; $P = 0.005$) and INI (OR = 1.048; $P = 0.009$).

Conclusion: Postsurgical outcomes between POs and NPOs were similar in this study. The rate of MLOR was not different between groups, despite differences in pin constructs. The NPO group experienced a statistically higher rate of INI (3.4%), although this association is likely confounded by longer operative time, which serves as a proxy for fracture complexity. The rate of other complications was similar between groups and universally low. These findings support the assertion that pediatric subspecialty training is not a prerequisite for safely and successfully treating these common injuries.