

Does Delay to Surgery in Type III Supracondylar Humerus Fractures Lead to Longer Surgical Times and More Difficult Reductions?

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Purpose: As numerous studies have shown that delay in reduction of pediatric supracondylar humerus fractures (SCHFx) does not affect clinical outcomes, and as many hospitals adopt dedicated daytime trauma operative time, more type III SCHFx are being pinned non-emergently after hospital admission. We sought to determine if delay in surgical treatment of type III SCHFx would affect the length of operative time.

Methods: This is an IRB-approved, retrospective review of a series of 309 modified Gartland type III supracondylar fractures treated operatively at a tertiary referral center from 2011 to 2013. Mean patient age was 5.4 years (range, 2-10). To balance the study design, 15 hours was selected as the cutoff between early and delayed treatment. 53.7% of fractures (166 of 309) were treated early, and 46.3% (143 of 309) were delayed. Surgical time was defined as "incision start" to "incision close." Fluoroscopy time was used as a surrogate for difficulty of reduction.

Results: Time from injury to operating room was shorter for high-energy fractures (fractures with soft-tissue or neurovascular injury) versus low-energy fractures (12.9 vs 15.3 hours, $P < 0.0001$); however, surgical time (37.3 vs 31.8 minutes, $P = 0.004$) and fluoroscopy time (54.6 vs 48.6 seconds, $P = 0.027$) were longer in high-energy fractures versus low-energy fractures. Among low-energy fractures, no significant difference was detected in surgical time between the early and delayed treatment groups (32.2 vs 31.4 minutes, $P = 0.514$) or in the fluoroscopy time (51.1 vs 46.3 seconds, $P = 0.646$). Additionally, there was no statistically significant difference found in surgical or fluoroscopy time with the presence of a surgical assistant. Mean surgical time when the attending surgeon was alone was 28.9 minutes, compared to 38.4 minutes with a fellow, 33.5 minutes with a resident, 34.8 minutes with a mid-level practitioner, and 40.9 minutes with both a fellow and resident ($P = 0.061$). Mean fluoroscopy time when the surgeon was alone was 42.3 seconds, compared to 58.2 seconds with a fellow, 51.3 seconds with a resident, 47.6 seconds with a mid-level practitioner, and 53.4 seconds with multiple trainees ($P = 0.127$).

Conclusion: Delay in surgery did not result in a longer surgical time or more difficult reduction for type III SCHFx. Patients with low-energy fractures still underwent a shorter operative time even with delay from injury to surgery. When excluding high-energy injuries, surgical treatment of Gartland type III SCHFx may be delayed without increasing surgical time or difficulty of reduction.