Adductor Canal Regional Anesthetic Placement in Pediatric Patients for Knee Arthroscopy: Defining the Optimal Location and Analysis of Other Trends

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Introduction: The incidence of acute sport injuries in children is on the rise, with 2.6 annual million emergency room visits for sports-related injury. Concurrently, opioid prescribing practices have increased in recent decades, especially in pediatric populations. To help curb opioid usage, a multimodal pain management guideline should be instituted. Further investigation is needed on the precision of regional anesthetic in performing an adductor canal nerve block (ACB) in pediatric knee arthroscopy procedures. Variations in nerve locations within the thigh may impact postoperative pain and opioid usage. We are interested in studying the optimal location of ACB placement to reduce postoperative pain and consequently reduce opioid medication usage after pediatric knee arthroscopy.

Methods: A prospective, double-blinded randomized control trial consisting of 80 pediatric patients (ages 5-17) undergoing knee arthroscopy at St. Christopher's Hospital for Children, approved by the Institutional Review Board. Enrolled patients are randomized to receive an ultrasound-guided placement of an ACB using 0.2% ropivacaine in one of three locations in the thigh: proximal, middle, distal, or control group with saline. The primary data collected are postoperative pain scores and amount of opioids taken, standardized to morphine milligram equivalents (MME), in the 24 and 48-hour postoperative period. Secondary outcomes included correlational assessment of pre and postoperative anxiety of patients and caregivers, correlation between patient anxiety and pain, and a postoperative dermatome sensation test. Data analysis performed with ANOVA test. Complete results including analysis of primary and secondary outcomes are shown in Tables 1 and 2.

Results: 60 patients (mean age 15.5) have completed this actively enrolling study. This includes 14 in the proximal placement group, 15 in the middle placement group, and 16 in the distal placement group, and 15 in the control group. Primary outcomes analysis showed no significant difference in pain scores or opioids taken at 24 and 48-hours postoperatively among groups. Increased anxiety positively correlated with heightened postoperative pain.

Conclusion: ACB placement in proximal, middle, and distal thigh locations provided comparable 24 and 48-hour postoperative analgesia and opioid medication usage in our first 60 patients.