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BACKGROUND

- Pediatric fractures of the femur are primarily treated with reduction of the fracture and hip spica cast placement from ages 6 months to 5 years old
- Results are generally good, with minimal complications
- This is usually done in the operating room under general anesthesia
- Pain control in pediatric patients is trending to move away from opioid prescriptions to minimize community prescriptions
- Hematoma blocks can be used to bathe fresh fracture sites in a local anesthetic, potentially decreasing the need for prescriptions of opioids for pediatric patients

OBJECTIVES

- To assess the efficacy in pain control for pediatric femur fracture patients treated in hip spica casts
- Assess pediatric opioid usage amongst pediatric femur fractures

METHODS

- Consecutive patients at Randall's Children's Hospital in Portland Oregon from 2018-2020 treated for femoral shaft fractures in hip spica casts were included in the study
- A 10cc volume of 0.2% ropivacaine was injected directly into the fracture hematoma using lateral approach after patients underwent anesthesia
- We tracked intra-operative, PACU, and post-operative opioid administration for the cohort of patients receiving hematoma block
- Opioids were prescribed at nursing/anesthesiologist discretion for perceived patient discomfort.
- Age, sex, laterality, fracture pattern, time in OR, complications, and morphine equivalent doses were recorded
- Intention to compare to prior cohort of patients treated without hematoma block at the same institution is underway

RESULTS

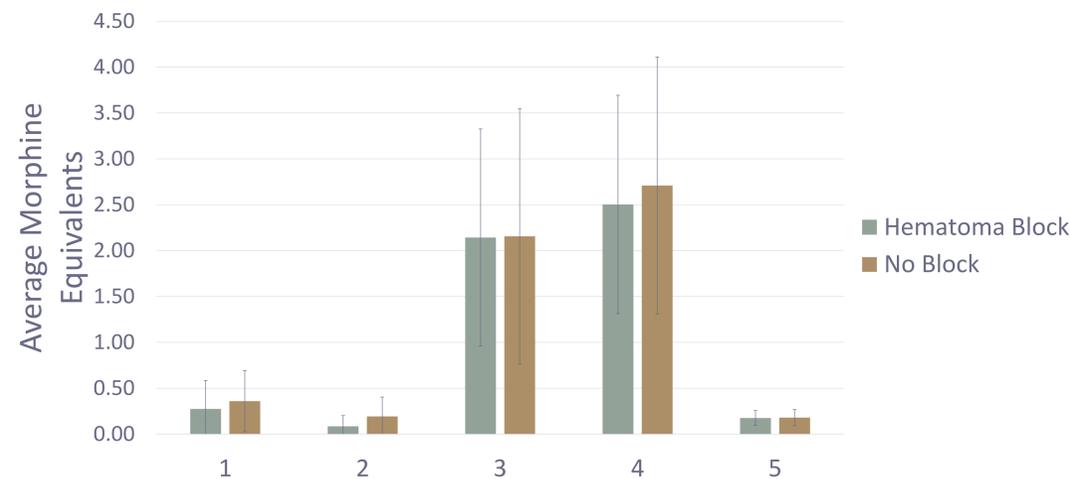


Figure 1: Average morphine equivalent doses over hospital stay for both patients receiving hematoma block and those not. (1) Average doses intra-operatively by anesthesiologist, (2) average doses in the PACU, (3) Average doses on the floor post-procedure, (4) Average MED per 24 hours, (5) average 24 hour morphine usage per kilogram



Figure 2: Fluoroscopic localization of needle into fracture site demonstrating appropriate positioning.

CONCLUSIONS

- This is a preliminary study
- Our data demonstrates low rates of opioid utilization intra-operatively, in the PACU, and on the floor following operative reduction and spica casting both with and without hematoma blocks
- There is a trend towards less usage of opioid medication both intra-operatively as well as directly post-operatively
- Administration of hematoma block can be done in a time efficient manner and does not effect the overall workflow or increase time in the OR compared to control group.
- Early prescribing of post-operative opioids continued following implementation of this protocol, which may have swayed the results in our small study.
- There was only one complication in our cohort, involving a malunion related to the fracture and casting rather than a block. All fractures went onto radiographic and clinical union regardless of injection, and the use of local anesthetic in the fracture site does not appear to effect healing in this age group- this was not directly investigated

FUTURE IMPLICATIONS

- We propose the addition of a simple hematoma block to treatment of pediatric femur fractures in the operating room during the application of hip spica casts
- Further studies will include a larger cohort, and larger matched control group to determine true efficacy

REFERENCES & ACKNOWLEDGEMENTS

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	Pt Age (yrs)	Time in OR (min)	Avg Weight (Kg)	Average 24 Hr MED (95% CI)	Avg 24/kilogram MED (95% CI)	OR MED(95% CI)	PACU MED (95% CI)	Floor MED (95% CI)
Hematoma Block	2.34 (1.9-2.7)	31.9 (28.4-35.3)	14.78 (13.3-16.2)	2.50 (1.31-3.69)	0.18 (0.1-0.26)	0.28 (-0.03-0.58)	0.09 (-0.03-0.20)	2.14 (0.96-3.33)
No Block	2.08 (1.7-2.5)	26.1 (22.5-29.7)	14.88 (12.9-16.8)	2.71 (1.31-4.11)	0.18 (0.9-0.27)	0.36 (0.03-0.69)	0.19 (-0.02-0.40)	2.26 (0.76-3.55)

Table 1: Demonstration of the average age, time in OR, average weight of patients, 24-hour opioid use, 24 hour weight based morphine equivalents, narcotics administered in the OR, PACU, and floor respectively. There was no significant differences in any category. There was a trend towards smaller OR, PACU, and floor administration but this was not statistically significant and weight-based doses administered were equivalent overall.