Effectiveness and Safety of Epidural versus General Anesthesia on Postoperative Outcomes in Pediatric Patients with Cerebral Palsy Undergoing Proximal Femoral Osteotomy, A National Matched Cohort Analysis

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INTRODUCTION:
Pediatric patients with cerebral palsy undergoing proximal femoral osteotomy face significant postoperative pain challenges. This study aimed to assess the efficacy of epidural anesthesia combined with general anesthesia compared to general anesthesia alone in reducing postoperative intravenous (IV) opiate usage in this vulnerable population.
METHODS:
A retrospective cohort study was conducted, analyzing medical records of pediatric cerebral palsy patients who underwent proximal femoral osteotomy between 2003 and 2023. This query was run in a large national database of healthcare organizations across the United States. Patients were dichotomized into two groups based on the anesthesia technique: general anesthesia only (General) and general anesthesia with adjunct epidural anesthesia (Epidural). The primary outcome measured was the use of IV opiates within the first three days post-operation. Secondary outcomes included the use of per os (PO) opiates, length of stay, and postoperative complications such as ICU admission, mortality, pneumonia, respiratory failure, urinary retention, and urinary tract infections. Patient characteristics such as age, BMI percentile, and gender were statistically controlled.
RESULTS:
In total, 1,303 patients were analyzed. 722 patients were included, with 361 receiving Epidural and 361 under General anesthesia. The Epidural group demonstrated a significantly lower proportion of IV opiate usage (55.68% vs. 71.75%, Risk Ratio [RR] = 0.78, 95% confidence interval [CI] 0.67-0.89, $p < 0.001$) within the first three days post-operation. There was no significant difference in the usage of PO opiates and the rates of ICU admissions, mortality, pneumonia, respiratory failure, urinary retention, or urinary tract infections between the groups. The Epidural group also showed a reduced overall length of hospital stay (3.41 days vs. 4.74 days, $p < 0.001$).
DISCUSSION AND CONCLUSION:
The addition of epidural anesthesia to general anesthesia in pediatric cerebral palsy patients undergoing proximal femoral osteotomy significantly reduces the need for IV opiates in the immediate postoperative period and shortens the hospital stay. Further, the use of epidural anesthesia is not associated with increased postoperative complications. These findings suggest that epidural anesthesia may be a preferable option for pain management in this population, potentially enhancing recovery and reducing the risk of opioid-related side effects.

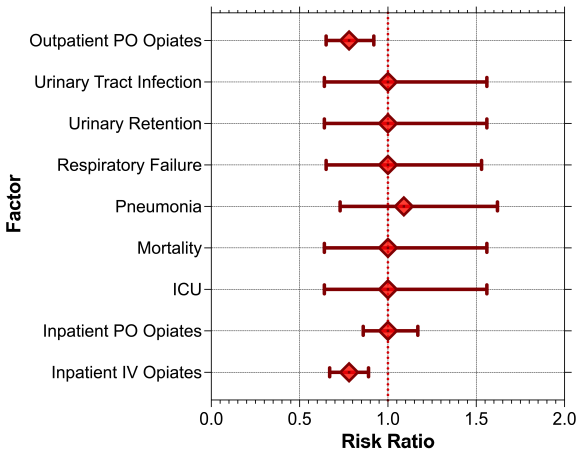

Table of Proportions & Risk

Time	Variable	Epidural	General	Epidural Proportion	General Proportion	Risk Ratio	LB	UB	P-Value
3 Days	IV Opiates	201	259	55.68%	71.75%	0.78	0.67	0.89	0.00
	PO Opiates	223	222	61.77%	61.50%	1.00	0.86	1.17	1.00
90 Days	ICU	10	10	2.77%	2.77%	1.00	0.64	1.56	1.00
	Mortality	10	10	2.77%	2.77%	1.00	0.64	1.56	1.00
	Pneumonia	12	11	3.32%	3.05%	1.09	0.73	1.62	1.00
	Respiratory Failure	11	11	3.05%	3.05%	1.00	0.65	1.53	1.00
	Urinary Retention	10	10	2.77%	2.77%	1.00	0.64	1.56	1.00
	Urinary Tract Infection	10	10	2.77%	2.77%	1.00	0.64	1.56	1.00
	Opioid	94	121	26.04%	33.52%	0.78	0.65	0.92	0.03
Overall	Length of Stay (days)	3.41	4.74						0.00