

Temporal Trends and Outcomes for General versus Regional Anesthesia in Hip Fracture Repair Surgery – A Retrospective Single-Center Study

Casey Kukielski MD, Brittany Deiling DO, Bhiken Naik MD, Nabil Elkassabany MD



Introduction

- Hip fractures are associated with significant morbidity and an estimated one-year mortality of 21% in the U.S.¹
 - It is anticipated that the incidence will triple by 2050 in the setting of an aging population
- Observational studies suggested that neuraxial anesthesia may improve patient outcomes in hip fracture surgery, but the REGAIN and RAGA trials concluded that neuraxial anesthesia was not superior to GA^{2,3}
- A 2020 Cochrane review of 43 RCTs reported that peripheral nerve blocks (PNBs) for hip fractures reduce dynamic pain scores, risk of delirium and chest infection, and time to first mobilization⁴
- It is unclear how the evolving literature has influenced changes in clinical practice

Study Aims:

- Investigate temporal trends in anesthesia techniques for hip fracture surgery
 - General versus neuraxial anesthesia, and use of PNBs
- Assess the diurnal variation of regional anesthesia utilization (during vs. outside of normal business hours)
- Study the association of anesthetic techniques with postoperative outcomes
 - Hospital length of stay, postoperative pain scores, acute kidney injury, myocardial injury, discharge disposition

Methods

- Retrospective single-center study of adult patients who underwent hip fracture surgery at UVA Medical Center from 1/2018 to 12/2022
- Patients were identified by CPT codes for hip fracture surgery and relevant data was collected from the EMR
- GLMERs with a Poisson Link were used to examine trends in anesthetic techniques over time

Results

Patient Demographic and Clinical Characteristics:

- 620 patients over five years (range 117-132 cases per year)
- Predominantly female (n=394, 63.5%) and Caucasian race (n=570, 92.1%)

General versus Neuraxial Anesthesia:

- 481 patients (77.6%) received general anesthesia and 139 patients (22.4%) received neuraxial anesthesia
- 30% increase in the number of neuraxial anesthesia cases per year from 2018 to 2022
- No difference in the proportion of cases who received general versus neuraxial anesthesia in cases starting before and after 5pm (p=0.466)
- Neuraxial anesthesia was associated with a 17.1% lower hospital length of stay compared to general anesthesia (mean 6.2 vs 7.4 days, p=0.006)
- No significant differences in postoperative pain scores, incidence of acute kidney injury, or odds of being discharged to home between the two groups
 - Insufficient data for analysis of postoperative myocardial injury

	M	SD
Age	74.31	10.99
BMI	26.28	6.51
Elixhauser score	3.06	6.29
Intraop OME (mg)	17.04	17.55
Intrap transfusion (#)	0.08	0.34
Surgery duration (min)	95.01	50.96
Anesthesia duration (min)	167.02	60.76
AUC for BP (< 60mmHg)	367.32	523.80
Time of admission to time to surgery	31.04	42.90
Postop OME (mg)	31.38	97.00

Table 1. Descriptive statistics of demographic and clinical characteristics.

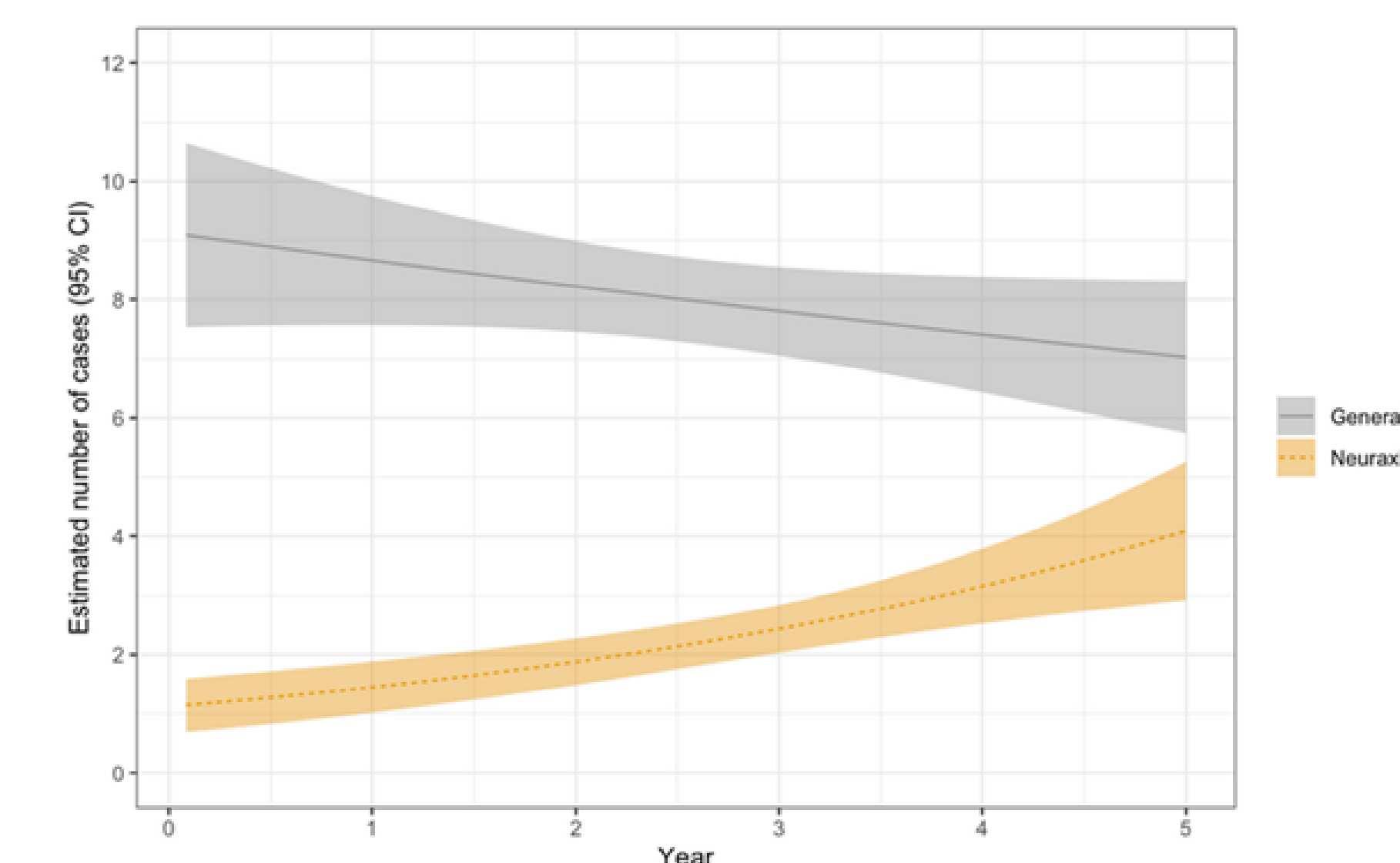


Figure 1. Estimated number of general and neuraxial cases over time. Shaded areas depict 95% confidence intervals.

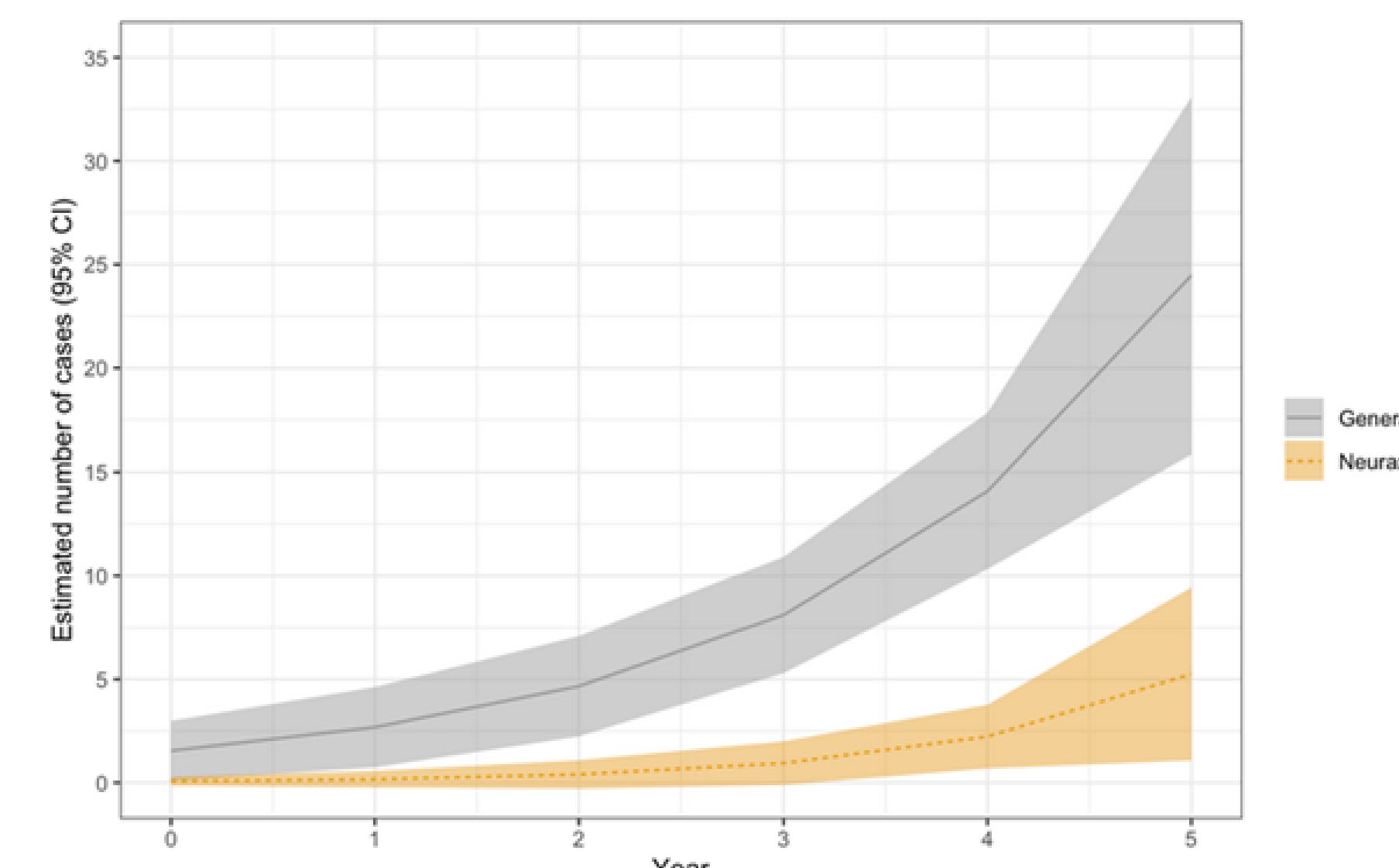


Figure 2. Estimated number of cases who received nerve blocks over time. Shaded areas depict 95% confidence intervals.

Peripheral Nerve Blocks:

- 63 patients (10.16%) received peripheral nerve blocks for postoperative analgesia
- Increasing trend in the use of peripheral nerve blocks over time (1.7% [n=2] in 2018 to 28.1% [n=32] in 2022)
- No evidence of diurnal variation or difference in postoperative outcomes

Discussion

- In summary, our analysis revealed trends of increasing use of neuraxial anesthesia and peripheral nerve blocks for hip fracture surgery at our institution over time, and neuraxial anesthesia was associated with a 17.1% lower hospital length of stay
- These trends are consistent with a prior observational study which reported a 50% increase in the use of spinal anesthesia for hip fracture surgery from 2007 to 2017, corresponding with the growth of an elderly subpopulation⁵
- Given the current evidence, the decision between neuraxial and general anesthesia will likely continue to largely depend on individual practice style and patient-specific factors
- Our results demonstrate progress in quality of care pertaining to peripheral nerve block utilization, but there is still significant room for improvement
- We were surprised by the lack of difference in regional anesthesia utilization in surgeries starting before and after 5pm, as we would have expected higher utilization during regular working hours at an institution with a dedicated regional anesthesia division
 - Possibly explained by most anesthesiologists being comfortable with neuraxial techniques and the low proportion of patients who received PNBs limiting the power to detect potential variation
- Our study has numerous limitations stemming from its retrospective single-center design and relatively small cohort, which inherently limit generalizability

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49th Annual Regional Anesthesiology
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March 21-23, 2024 | San Diego, CA

