



Evaluating Anesthesia Techniques & Outcomes in Outpatient Total Joint Arthroplasty

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Introduction

Total Hip Arthroplasty (THA) and Total Knee Arthroplasty (TKA) are prevalent procedures for severe hip and knee conditions. There is debate regarding the most appropriate anesthetic techniques for outpatient TKA and THA.¹⁻⁴ Further, there is little guidance on selecting appropriate patients for ambulatory surgery centers (ASC). This study aims to evaluate the determinants of successful ASC total joint arthroplasty and to provide evidence that general anesthesia combined with peripheral nerve blocks is a safe and valid consideration in the private practice setting.

Methods

Following IRB approval, medical charts were retrospectively analyzed from 15 months (January 2023 to March 2024) of TKA and THA patients undergoing general anesthesia at an orthopedic ASC. Demographics and categorical parameters were described for postoperative care unit (PACU) time, pain scores, oral and intravenous (IV) opioid use. Statistical analyses were performed using SPSS version 29. Complications and the need for direct and delayed hospital admission were analyzed. The anesthesia group determined exclusion criteria for all ASC cases.

Results

Of the 1,944 charts identified, 1,889 met inclusion criteria. There were 568 THA, and 1,321 TKA/unilateral knee (UKA) patients included. All patients received a general anesthetic (GA), multimodal analgesia including single injection peripheral nerve blocks (PNB), and aggressive nausea prophylaxis.

Results Cont.

ASA 3 patients constituted 41.2% of THA and 48.6% of TKA/UKA patients. 32.5% of THA and 47.2% of TKA/UKA patients were over 70 years old. Additionally, 10.2% of THA and 14.9% of TKA/UKA patients had a BMI greater than 40. Notably, 28% of ASA 3 patients in both groups had five or more major comorbidities.

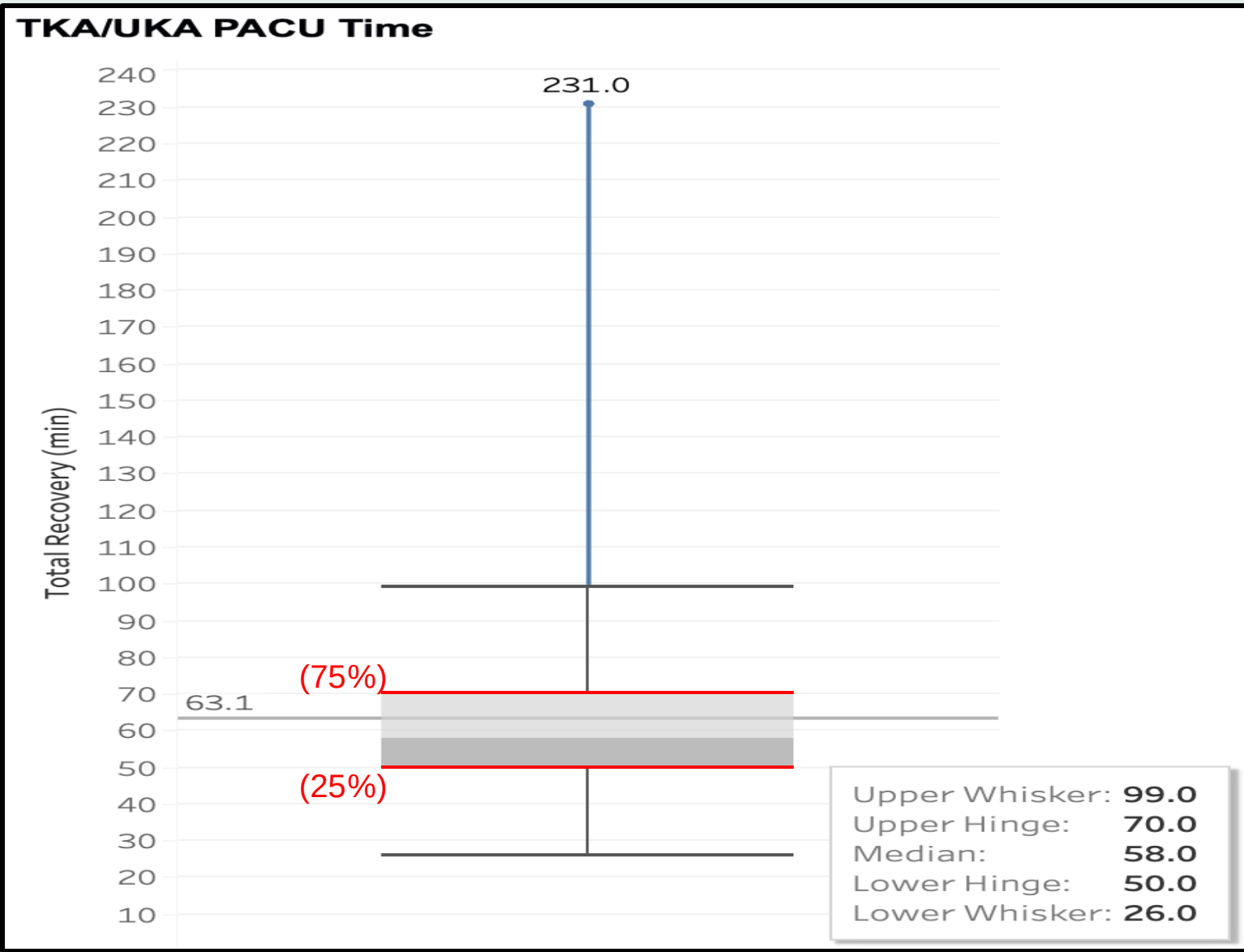
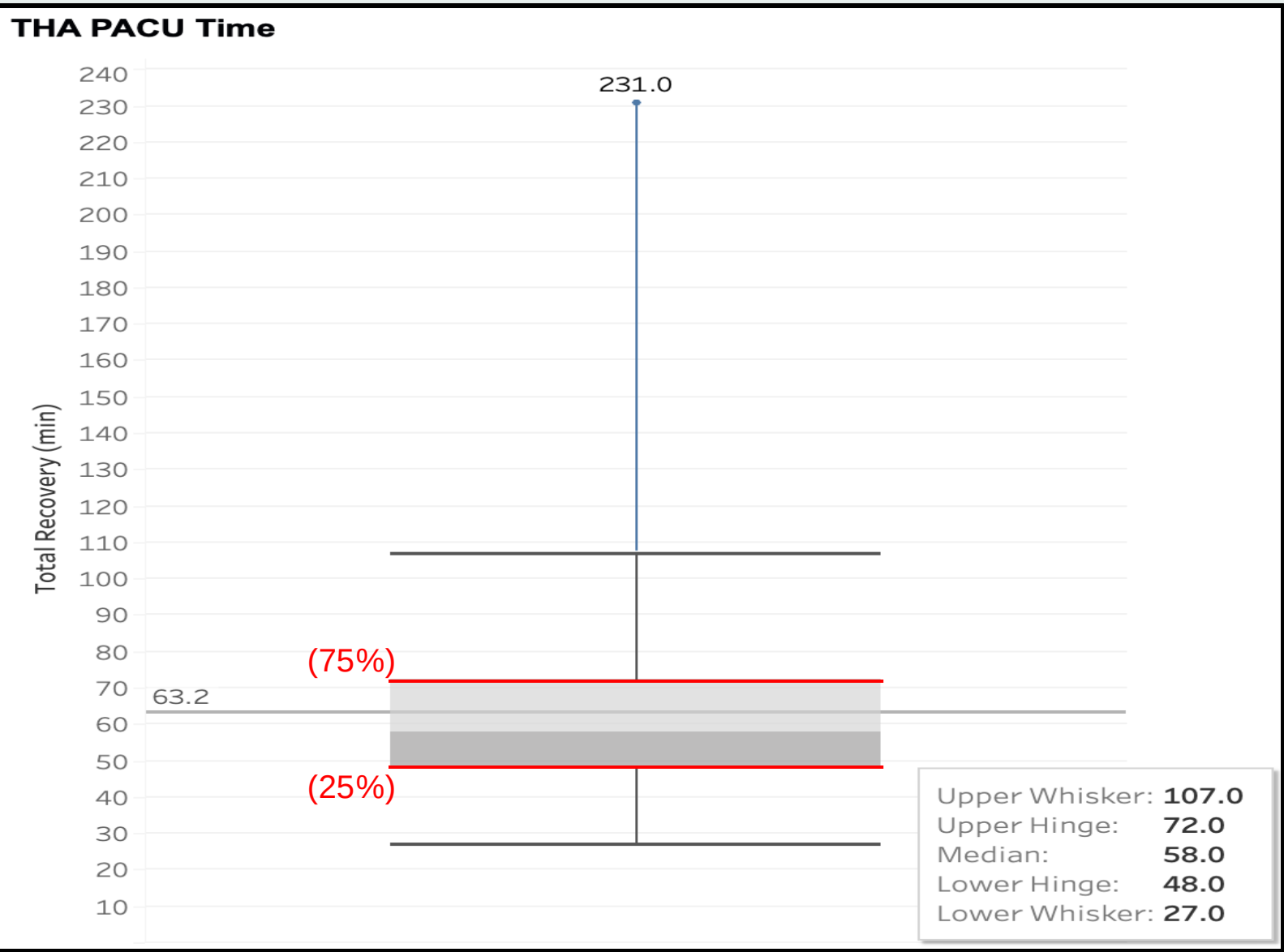
Postoperative IV opioids were required in approximately 2% of patients with PACU times of approximately 63 minutes. PONV was identified in 7.2% of patients overall which increased PACU times by approximately 10%. Pain score analysis showed an average (0-10 scale) of 5.86 preop and 4.13 postop and 4.66 preop and 3.77 postop for THA and TKA/UKA, respectively.

There were 107 identified complications among 69 unique patients, resulting in a 3.65% complication rate. Most complications were minor. Significant complications were primarily surgical. The frequency of individual complications was less than 1%. Three patients required direct hospital admission, two for new onset arrhythmia and one for mental status change after PNB.

Disposition and Most Common Complication

	#	%
Direct Transfer	3	0.15
Remote Hospital Admission	14	0.74
ER-24 hrs	2	0.1
ER-48 hrs	2	0.1
Postop Infection	15	0.79
Irrigation And Debridement	15	0.79
Knee Manipulation	12	0.63
Fall>24Hrs	12	0.63
Wound Dehiscence	11	0.58
Knee Immobilizer> 24	7	0.37

THA (n=568)	Category	TKA/UKA (n=1,321)
261/307	Gender (M/F)	517/807
64.0 ± 11.2	Mean Age (years)	68.0 ± 9.4
24-89	Age Range (years)	38-92
30.9 ± 6.3	Mean BMI	32.5 ± 6.4
17.2-48.8	BMI Range	16.9-53.2
10.2%	% BMI > 39.9	14.9%
41.2%	% ASA 3	48.6%
3.7 ± 1.6	Avg # ASA 3 Comorbidities	3.7 ± 1.5
1-8	ASA 3 Comorbidity Range	0-9
THA (n=568)	Outcomes	TKA/UKA (n=1,321)
63.2% (359)	PACU PO Opioids (%)	66.5% (878)
2.1% (12)	PACU IV Opioids (%)	2.2% (29)
63.2 ± 23.7	Mean PACU Time (min)	63.1 ± 21.6
7.9% (45)	PONV Incidence (%)	6.9% (91)
70.7 ± 27.4	PONV Mean PACU Time (min)	68.9 ± 21.6
5.9 ± 3.1	Preop Pain Score (Mean ± SD)	4.7 ± 3.0
4.1 ± 3.1	Postop Pain Score (Mean ± SD)	3.8 ± 3.16
50.8% (128)	Postop Pain Score <4 (%)	58.5% (319)



Conclusions

GA combined with single injection nerve blocks for ASC total joint arthroplasty appears both safe and effective, even for older ASA 3 patients with multiple comorbidities. The success of this approach with ASC arthroplasty patients is reflected in short PACU times, low pain scores, minimal PACU IV opioid use, and a low complication rate. These findings validate the importance of effective analgesia and a well-developed infrastructure involving patient and staff education for ASC arthroplasty surgery. The low short and long-term complication rates provide evidence of the safety of utilizing GA in the private practice ASC setting. Key determinants for successful ASC total joint arthroplasty surgery include careful patient selection, reliable analgesia, minimizing opioid side effects, surgical skill, patient education, and effective coordination of care pathways. Further research is needed to validate these findings and to develop detailed ASC guidelines for total joint arthroplasty.

References

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