



Intraoperative Auricular Acupuncture Among Patients Undergoing Total Hip Arthroplasty Surgery: Experiences From A High-Volume Orthopedic Center

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INTRODUCTION

- Total hip arthroplasty (THA) is associated with significant postoperative pain, necessitating opioid-based analgesia that may lead to side effects.
- **CHENG Protocol** → intraoperative auricular acupuncture technique, may enhance multimodal analgesia by reducing pain, stress, and inflammation.
- At our high-volume orthopedic institution, this protocol is routinely employed by anesthesiologists.

We aimed to report outcomes at a high volume surgical setting with high use of peripheral nerve blocks (PNB)

METHODS

- Retrospectively analyzed **5467 inpatient** (hospital stay >23 hours) and **4811 outpatient** THA records at the Hospital for Special Surgery from January 2021 to March 2025
- Three groups were analyzed:
 1. Acupuncture and without PNB (Acu+PNB-)
 2. Without acupuncture but with PNB (Acu-PNB+)
 3. Without acupuncture nor PNBs (Acu-PNB-)
- Outcomes: opioid use (milligram morphine equivalents; MME) in the first 48 hours after surgery, length of hospital stay (from post-anesthesia care unit entry to discharge)
- Regression models measured associations between groups and outcomes
 - Models are adjusted for year, race, ethnicity, age category, sex, BMI, history of PTSD, chronic pain medication use, and ASA status

“Intraoperative auricular acupuncture using the CHENG Protocol may reduce opioid use and shorten length of stay”

Table 1: Demographic Variables

	INPATIENTS (n=4934)				OUTPATIENTS (n=4088)			
	Acu-PNB+, Acu-PNB- (n=4401)		Acu+PNB- (n=533)		Acu-PNB+, Acu-PNB- (n=3365)		Acu+PNB- (n=723)	
	N	%	N	%	N	%	N	%
Female Sex	3089	62.61	351	65.85	1914	46.82	350	48.41
ASA Comorbidity								
1	135	2.74	1	0.19	203	4.97	11	1.52
2	3674	74.46	415	77.86	3477	85.05	635	87.83
3	1125	22.8	117	21.95	408	9.98	77	10.65
Age Category								
35-44	142	2.88	11	2.06	153	3.74	34	4.7
45-54	456	9.24	48	9.01	617	15.09	108	14.94
55-64	1251	25.35	124	23.26	1595	39.02	286	39.56
65-74	1806	36.6	201	37.71	1316	32.19	225	31.12
75-84	1066	21.61	129	24.2	389	9.52	65	8.99
85+	213	4.32	20	3.75	18	0.44	5	0.69
Primary Anesthetic Modality								
General Anesthesia	278	5.63	1	0.19	90	2.2	1	0.14
Neuraxial Block	4656	94.37	532	99.81	3998	97.8	722	99.86
Antiemetic Use	1195	24.22	156	29.27	538	13.16	126	17.43
Acute Pain Consult	398	8.07	35	6.57	33	0.81	10	1.38
Prolonged Length of Hospital Stay (75 th percentile)	2306	46.74	203	38.09	n/a	n/a	n/a	n/a
High Opioid (MME) use, 48 hours (75 th percentile)	1444	29.27	163	30.58	350	8.56	39	5.39
Number of PNBs								
0	3535	71.65	n/a	n/a	2982	72.95	n/a	n/a
1	398	8.07	n/a	n/a	341	8.34	n/a	n/a
2	995	20.17			763	18.66		
3 or 4	6	0.12			2	0.10		

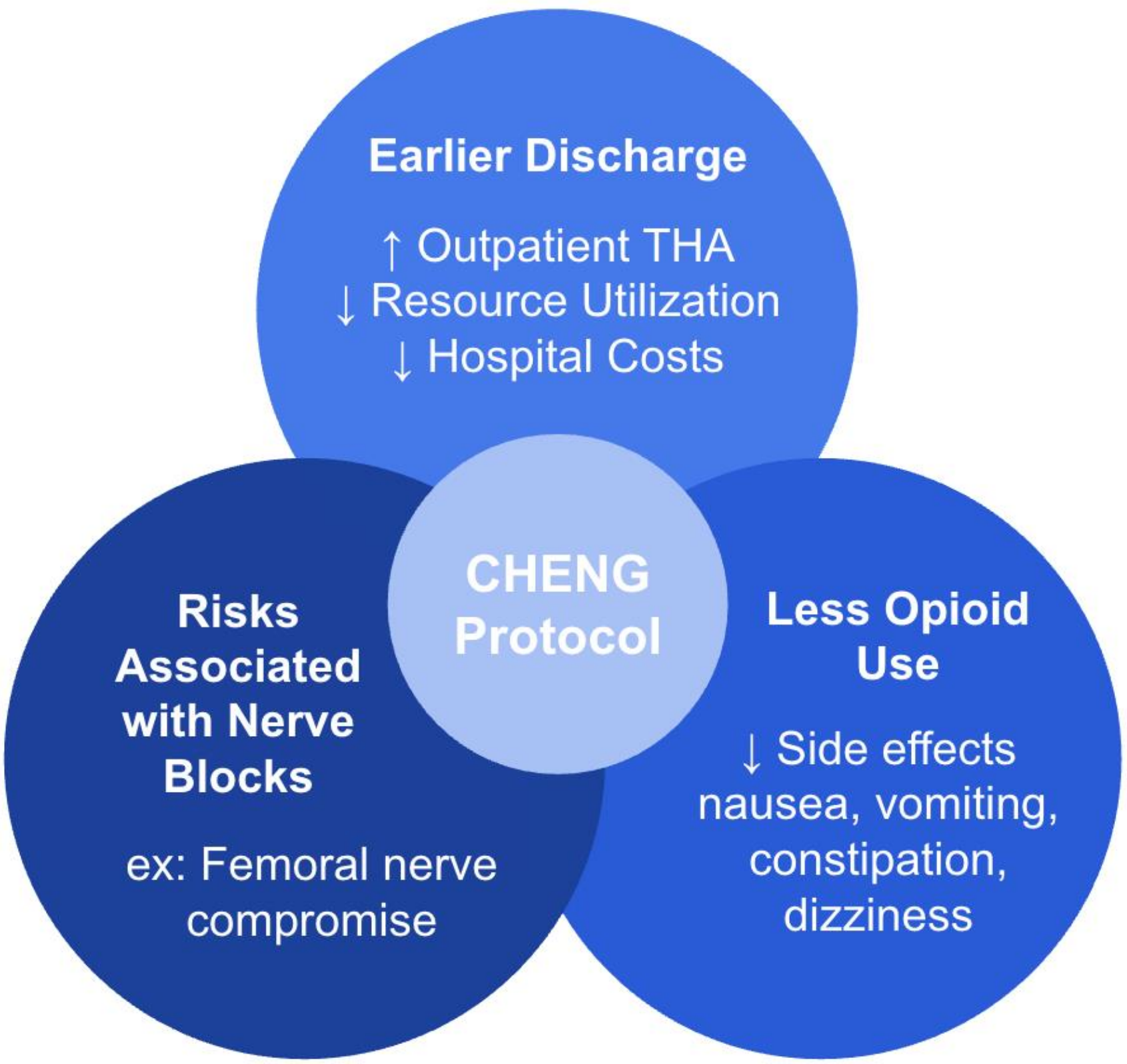
Abbreviations: Anesthesiologist Score (ASA), milligram morphine equivalents (MME), peripheral nerve block (PNB).

Table 2: Adjusted regression models assessing outcomes between groups

Postoperative Outcomes	Inpatient Adjusted Mean (95% CI)	Outpatient Adjusted Mean (95% CI)	P-value* (Inpatient)	P-value* (Outpatient)
Opioid Use (MME)				
Acu-PNB-	72.7 (41.0, 128.8)	31.8 (25.3, 40.0)	—	—
Acu-PNB+	71.4 (40.3, 126.6)	33.6 (26.6, 42.5)	0.6314	0.2755
Acu+PNB-	64.8 (36.5, 115.3)	30.5 (23.7, 39.2)	0.0329	0.4814
Length of Hospital Stay (Hours)				
Acu-PNB-	51.9 (38.6, 69.9)	14.2 (12.6, 16.0)	—	—
Acu-PNB+	51.8 (38.4, 69.7)	15.6 (12.9, 16.5)	0.8693	0.2972
Acu+PNB-	47.6 (35.3, 64.1)	13.9 (12.2, 15.9)	0.0036	0.4806

*each P-value compares the row to the reference group "Acu-PNB-"

Abbreviations: confidence interval (CI), milligram morphine equivalents (MME), peripheral nerve block (PNB).



RESULTS

- **Inpatient THAs:**
 - 9.7% (n=533) were Acu+PNB-
 - 90.3% did not receive acupuncture (n=3535 Acu-PNB-, n=1399 Acu-PNB+)
- **Outpatient THAs:**
 - 15.0% (n=723) were Acu+PNB-
 - 85.0% did not receive acupuncture (n=2982 Acu-PNB-, n=1106 Acu-PNB+).
- For inpatients, the Acu+PNB- group showed significantly lower 48-hour MME use and shorter LOS compared to both Acu-PNB+ and Acu-PNB-
- For outpatients, the Acu+PNB- group had lower maximum pain scores compared to the Acu-PNB+ group (4.9 vs 5.3, p=0.02).

DISCUSSION

- Intraoperative auricular acupuncture may reduce opioid use and shorten LOS, offering a promising non-pharmacologic adjunct to managing postoperative pain
- Further prospective research is needed to confirm these findings for orthopedic surgery patients and assess its role in reducing pain, LOS, and MME use in the outpatient setting