

The Impact of Tumescant Local Anesthesia on Postoperative Pain and Opioid Use in DIEP Flap Breast Reconstruction

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Introduction

- The **opioid epidemic** continues to pose significant public health challenges, with reported costs exceeding \$1.02 trillion in 2017 due to opioid use and fatal overdoses.¹³
- In efforts to enhance postoperative pain control and reduce the risk of opioid misuse, our team has implemented the use of tumescant local anesthesia with bupivacaine (TLA) in DIEP flap breast reconstruction for both the breast and abdominal donor-site.

Objectives

This study aims to evaluate the impact of **tumescant local anesthesia** on postoperative pain and opioid use in patients undergoing DIEP flap breast reconstruction.

Methods

- An institutional retrospective study on patients who underwent DIEP flap BR from 2018 to 2023 was conducted.
- Patients were categorized by TLA use:
 - Tumescant:** Tumescant fluid and Bupivacaine as a TAP block and intercostal and local anesthetic block.
 - No Tumescant:** TAP block alone (Bupivacaine)
- Multivariable linear regression models evaluated differences between groups.

Demographics

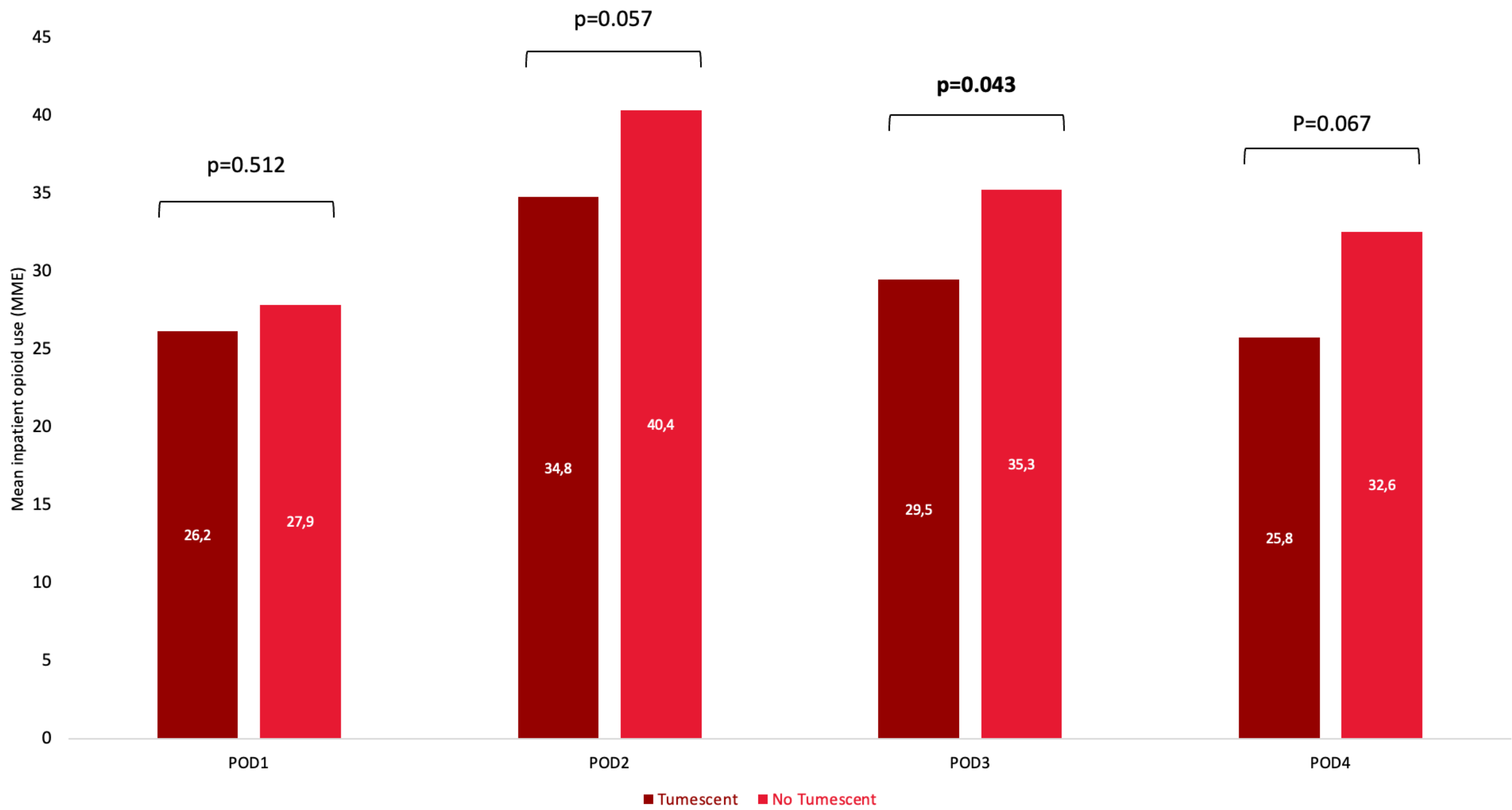
Characteristics	Tumescant	No Tumescant	p-value
Total <i>n</i> (%)	271 (56.3)	210 (43.7)	
Age mean (SD)	50.3 (9.3)	53.7 (22.3)	0.025
BMI mean (SD)	29.5 (5.7)	28.8 (5.9)	0.211
Race <i>n</i> (%)			0.682
White	196 (75.1)	162 (79.8)	
Black	27 (10.3)	21 (10.3)	
Asian	16 (6.1)	9 (4.4)	
Other	11 (4.2)	5 (2.5)	
Not Reported	11 (4.2)	6 (3.0)	
Ethnicity <i>n</i> (%)			0.336
Non-Hispanic	229 (88.4)	187 (91.7)	
Hispanic	15 (5.8)	11 (5.4)	
Not Reported	15 (5.8)	6 (2.9)	
Smoking History <i>n</i> (%)	53 (19.7)	49 (23.3)	0.369
Alcohol use <i>n</i> (%)	146 (54.7)	104 (50.2)	0.355
Steroid use <i>n</i> (%)	20 (7.4)	28 (13.7)	0.031
Narcotics use <i>n</i> (%)	65 (24.1)	67 (31.9)	0.064
Hormonal Therapy use <i>n</i> (%)	93 (34.7)	91 (43.8)	0.047
Radiation <i>n</i> (%)	106 (39.1)	111 (52.9)	0.003
Chemotherapy <i>n</i> (%)	102 (37.6)	96 (45.7)	0.077
Comorbidities <i>n</i> (%)			
Diabetes	19 (7.0)	21 (10.0)	0.248
Hypertension	56 (20.7)	58 (27.6)	0.084
Chronic kidney disease	2 (1.7)	3 (2.8)	0.672
Dyslipidemia	46 (38.7)	44 (41.1)	0.786
Fibromyalgia	5 (1.8)	8 (3.8)	0.258
Autoimmune disorders	7 (2.6)	12 (5.7)	0.099
Chronic pain diagnosis	16 (5.9)	11 (5.2)	0.843
Hypercoagulable state	29 (10.7)	20 (9.5)	0.762

Post-Operative Complications

- Post-operative breast hematoma:
 - Tumescant:** 12 (4.5%)
 - No Tumescant:** 13 (6.2%); **p=0.033**

Univariate analyses revealed significant lower rates of hematoma in the tumescant group. No significant differences in other postoperative complications were found between groups.

Inpatient opioid use in MME by TLA for the first 4 days



Multivariate linear Regression Models

	Overall pain (VAS)		Overall inpatient opioid use (MME)		Overall opioid prescribed at discharge (MME)	
	Coefficient (95% CI)	p-value	Coefficient (95% CI)	p-value	Coefficient (95% CI)	p-value
No Tumescant	<i>Reference</i>		<i>Reference</i>		<i>Reference</i>	
Tumescant	0.265 (-0.04, 0.57)	0.086	-29.379 (-45.29, -13.45)	<0.001	-36.127 (-58.27, -13.98)	0.001

- Linear regression models demonstrated an **average inpatient opioid use of 29.4 MME** (morphine milligram equivalent) **lower** than the control group (95% CI [-45,29,-13.45]; **p<0.001**).
- Additionally, TLA had an **average opioid prescribed at discharge of 36.1 MME lower** than the control group (95% CI, [-58.27,-13.98]; **p<0.001**).

Postoperative pain and opioid use

Post-Operative Complication	Tumescant	No tumescant	p-value
Overall postoperative pain (VAS) mean (SD)	4.3 (1.6)	4.1 (1.4)	0.113
POD1 pain (VAS) mean (SD)	4.6 (1.8)	4.4 (1.8)	0.416
Inpatient opioid use <i>n</i> (%)	259 (95.9)	204 (97.1)	0.620
Overall inpatient opioid use (MME) mean (SD)	85.8 (82.0)	108.5 (84.5)	0.003
Outpatient opioid use			
Opioid prescription at discharge <i>n</i> (%)	258 (95.6)	202 (96.2)	0.820
Renewal of opioid prescription <i>n</i> (%)	44 (17.4)	31 (16.1)	0.799
Total amount of prescribed opioid at discharge (MME) mean (SD)	177.3 (117.0)	206.7 (104.3)	0.006
Nausea, vomiting, anti-emetic use <i>n</i> (%)	269 (99.3)	210 (100.0)	0.507

Conclusions

- Our findings suggest that the use of TLA during DIEP flap breast reconstruction is significantly associated with **reduced opioid consumption both during hospitalization and post-discharge**.
- Using a multimodal strategy for pain reduction, our study proposes a strategy to **potentially decrease opioid misuse**.

References

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