Peripheral Nerve Block Reduces Post-operative Pain and Narcotic use in Robotic Inguinal Hernia Repair

DONALD AND BARBARA ZUCKER SCHOOL of MEDICINE AT HOFSTRA/NORTHWELL

Jacqueline Hausner, BS; Dane Thompson, MD; Sara Siskind, MD; Justin Yu, MD; Gene Coppa, MD; Gianosuke Sugiyama, MD

ELMEZZI GRADUATE SCHOOL of MOLECULAR MEDICINE AT NORTHWELL HEALTH

BACKGROUND

- Over 700,000 inguinal hernia repairs are performed every year in the United States.
- The majority of inguinal hernias are still repaired with an open procedure, but the rates of laparoscopic, and, more recently, robotic repairs are growing in popularity.
- Robotic repair has the advantage of allowing access to both sides with a single set of incisions. Additionally, the robot allows for superior visualization and control compared to other minimally-invasive techniques.

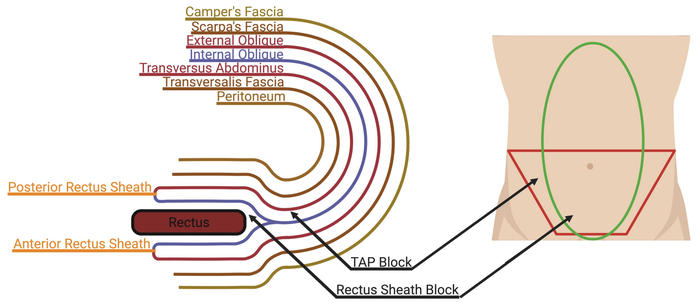
METHODS

- A retrospective review was performed.
- All adult patients who underwent robotic inguinal hernia repair within the Northwell Health System were initially included.
- Patients who were converted to open or laparoscopic operations were excluded.
- Patients were not excluded for concurrent repair of a femoral or umbilical hernia.
- Hernia size was based on the size of the implanted mesh.
- Narcotic medications were converted to milligram morphine equivalents (MME) for comparison.

Study Aim

- Regional nerve blocks have been shown to reduce post-operative pain and narcotic use in both open a laparoscopic inguinal hernia repairs.
- The goal of this study is to determine if regional nerve blocks are also effective in robotic repairs.

PERIPHERAL NERVE BLOCK



- Rectus Sheath Block: injection of local anesthetic within the sheath, providing anesthesia to the T7-T11 spinal nerve roots.
- Transversus Abdominus Plane Block: injection of local anesthetic between the internal oblique and transversus abdominus providing anesthesia to the T6-L1 thoracolumbar nerves.

RESULTS

	No Block (n = 135)	Block (n = 23)	OR [CI 95%]	p-value
Demographics				
Age (years), mean (std dev)	58.41 (15.08)	57.09 (14.49)	-	0.6654
Gender				
Female, n (%)	13 (10)	1 (4)	Ref.	-
Male, n (%)	122 (90)	22 (96)	2.34 [0.39 to 26.05]	0.41
BMI, mean (std dev)	26.50 (4.023)	28.21 (5.038)	-	0.0651
ASA				
1	17 (13)	2 (13)	Ref.	-
2	84 (62)	15 (65)	1.01 [0.28 to 3.58]	>0.9999
3	34 (25)	5 (22)	0.83 [0.18 to 3.45]	>0.9999
Hernia Characteristics				
Recurrence, n (%)	19 (14)	1 (4)	3.60 [0.55 to 39.22]	0.1947
Bilateral, n (%)	96 (71)	15 (65)	1.31 [0.52 to 3.45]	0.5676
Concurrent Hernia				
Femoral, n (%)	7 (5)	3 (13)	0.36 [0.09 to 1.39]	0.1525
Umbilical, n (%)	18 (13)	6 (26)	0.44 [0.15 to 1.28]	0.1152

	Transversus Abdominis Plane (n = 17)	Rectus Sheath (n = 6)	p-value
Operative Outcomes			
Anesthesia Time (min), mean (std dev)	42 (5.02)	48.33 (7.15)	**0.0253**
Cut-to-close Time (min), mean (std dev)	66.88 (18.84)	60.33 (17.97)	0.441
Room Time (min), mean (std dev)	108.9 (21.66)	108.7 (14.42)	0.5966
Bupivacaine (milligrams), mean (std dev)	129.1 (52.69)	200.8 (70.74)	**0.0269**
Lysis of Adhesions, n (%)	2 (12)	0 (0)	0.3793
Mesh Area (cm2), mean (std dev)	264.7 (65.59)	200.0 (77.46)	0.131
Post-operative Outcomes			
Post-anesthesia Care Unit Time (min), mean (std dev)	126.7 (92.41)	139.2 (57.21)	0.3124
Pain at Discharge from PACU, mean (std dev)	0.2941 (0.85)	1.000 (1.55)	0.4241
Milligram Morphine Equivalents Required on the Day of Surgery, mean (std dev)	1.765 (3.45)	5.967 (4.80)	**0.029**

	No Block (n = 135)	Block (n = 23)	p-value
Operative Outcomes			
Anesthesia Time (min), mean (std dev)	37.83 (12.38)	43.65 (6.169)	**0.0001**
Cut-to-close Time (min), mean (std dev)	91.87 (27.67)	65.17 (18.45)	**0.0001**
Room Time (min), mean (std dev)	128.9 (29.19)	108.8 (19.71)	**0.0008**
Mesh Area (cm2), mean (std dev)	260.8 (75.89)	247.8 (73.05)	0.4416
Bupivacaine (mg) (Peripheral nerve block), mean (std dev)	-	128.0 (60.17)	-
Bupivacaine (mg) (Local), mean (std dev)	8.62 (3.31)	6.174 (6.290)	**0.0001**
Bupivacaine (mg) (Total), mean (std dev)	8.62 (3.31)	134.2 (60.39)	**0.0001**
Post-operative Outcomes			
Post-anesthesia Care Unit Time (min), mean (std dev)	131.7 (62.8)	130.0 (83.58)	0.2861
Pain at Discharge from PACU, mean (std dev)	0.79 (1.61)	0.4783 (1.082)	0.4995
Average pain	0.79 (1.61)	0.4783 (1.082)	0.4665
Milligram Morphine Equivalents Required on the Day of Surgery, mean (std dev)	2.39 (3.14)	2.861 (4.176)	0.9405
Total MME	2.42 (3.15)	2.861 (4.176)	0.9906
Length of Stay (days), mean (std dev)	1.09 (0.64)	1 (0)	>0.9999

DISCUSSION

- The non-block and block patients had similar demographics and hernia characteristics.
- Block patients required a longer anesthesia time, but cut-to-close and overall room time were shorter.
- Block patients had lower pain at discharge from PACU and average pain, but did not reach statistical significance.
- Subgroup analysis demonstrated that TAP required significantly less anesthesia volume and narcotic medication on the day of surgery.
- Pain was also lower in TAP patients, but did not reach statistical significance.

SAGES 2022 DENVER, CO