ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 03, 2021

EFFICACY OF ULTRASOUND GUIDED THORACO LUMBAR INTERFASCIAL PLANE BLOCK VERSUS EPIDURAL ANALGESIA IN PAIN MANAGEMENT FOLLOWING LUMBAR DISC SURGERY

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Abstract:
Background: The thoracolumber interfascial plane (TLIP) block is a major regional anaesthetic technique impacting the dorsal rami of the thoracolumbar nerves as they travel through the paraspinal musculature rather than the ventral rami (analogous to the ventral rami for the TAP block).

Patients and Methods: This prospective, randomized, double-blind, controlled study was conducted in Minia University Hospital from 6- 2018 to 6- 2020, after permission by the Minia University faculty of medical ethical committee (22/2018) and informed written consent. The study participants ranged in age from 18 to 70 years old and had an ASA physical status of I to II. They were planned to have lumbar discectomy or lamenectomy procedures under general anesthesia.

Results: The median VAPS score at rest was notable decreased in TLIP group than control group during 12 h postoperative, while in comparison with E group was significantly lower from 4h to 12h. E group showed important decreased median VAPS than control group during first 4h postoperative. Dynamic VAPS was notable lower in TLIP group in the first 12 h of the observing day in comparison to control group, while it was much lower than epidural group from 4h to 12h. E group showed significantly lower median VAPS than control group during the first 2h postoperative. TLIP group showed the lowest cumulative fentanyl consumption (44.20±12.39) than epidural (114.00±23.8) and control groups (160.80±32.82).

Conclusion: In individuals undergoing lumbar discectomy, ultrasound guided thoracolumbar interfascial plane block has been linked to lower opioid use and good pain scores when matched to epidural anesthesia at closure. We believe that thoracolumbar interfascial plane block is an useful replacement for postoperative analgesia after lumbar discectomy and should be utilized as part of a balanced analgesia strategy

Keywords: laminectomy, post operative analgesia, Thoracolumber interfascial plane, epidural anesthesia, ultrasound guidance.

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Introduction:

Pain after spinal surgery can originate from vertebra, intervertebral discs, facet joints, muscles, skin and subcutaneous tissues **(1).** Despite pain is nociceptive in nature, it can have a neuropathic form , so adequate pain relief after spine surgery is essential. It can include non-steroidal anti-inflammatory drugs, gabapentins, prengabalins, systemic opioids, neuroaxial analgesia and regional blocks which become popular in recent years **(2).**

A number of regional anesthetic approaches have been found to be useful in the controlling of acute pain during the perioperative period. Furthermore, Enhanced Recovery After Surgery (ERAS) principles advise for using regional anesthesia procedures whenever available in order to reduce the need of opioid analgesics **(3).**

The thoracolumber interfascial plane (TLIP) block is a major local anesthetic strategy that targets the dorsal rami of the thoracolumbar nerves as they travel along para-spinal musculature rather than the ventral rami . As described by Hand et al. in 2015, the TLIP block is performed by introducing a local anesthetic drug into the fascial plane between the multifidus and longissimus muscles at the approximate height of the third lumbar vertebra. **(4).**

Patients and Methods:

Following Minia University, faculty of medicine ethical committee approval (22/2018) and informed written consent, this prospective, randomized, double blind, controlled study was performed in Minia University Hospital in the period from June 2018 to June 2020. This study involved 75 patients aged from 18-70 years, American Society of Anesthesiologists (ASA) physical status I to II scheduled to undergo lumbar discectomy or lamenectomy surgeries under general anesthesia.

Exclusion criteria: Patients who have one or more of the following criteria : Patient refusal to give informed consent or patients with communication difficulties, Patients who have had lumbar surgery in the past (Secondary surgery), or operation involving more than 2 inter vertebral space, patients who had been on an opioid regimen for more than one month prior to surgery , allergy to local anesthetic agent, coagulopathies with INR >1.5 and infection, injury or a lesion at the block site..

Study groups: Participants were divided into 3 equal groups at random (Computer-generated randomization tables were used to assign 25 participants to each group as follow: Group I (group T): ultrasound guided TLIP block was performed with 40 ml bupivacaine 0.25% (20 ml on each side) before induction of general anesthesia. Group II (group E): Epidural injection of 20 ml of bupivacaine 0.25% by the surgeon at the finish of the procedure just before wound closure. Group III (group C): Patients received only general anesthesia as a control group.

Primary outcome: Visual analogue pain score during the first postoperatively 24 at rest and during movement and cumulative fentanyl consumption over 1st 24hrs.

Secondary outcome: Time of the 1st post-operative analgesic intake, OBAS and incidence of any side effect (complications related to the block or side effects of opioids)

Preoperative assessment: One day prior to surgery, detailed medical history, physical examination and routine investigations were performed. In addition the block procedure, the informed consent and how to explain the intensity of pain using the visual analogue pain scale (VAPS), scored from 0-10 (where 0=no pain and 10=the worst pain), were all explained to the patients.

Equipment and drugs used in the study: (figure.1): Ultrasound machine and scanning probe (SONOSITE M-TURBO, USA) the scanning probe was the low frequency curvilinear probe for deep penetration and wider field of view, 22-gauge spinal quincke needle for skin infiltration (GMS, Egypt), 10 ml syringes for injection, sterile gloves and sterile gauze packs and sunny bupivacaine 0.5% vial 20ml: 5mg in each 1ml (sunny pharmaceuticals, Egypt).

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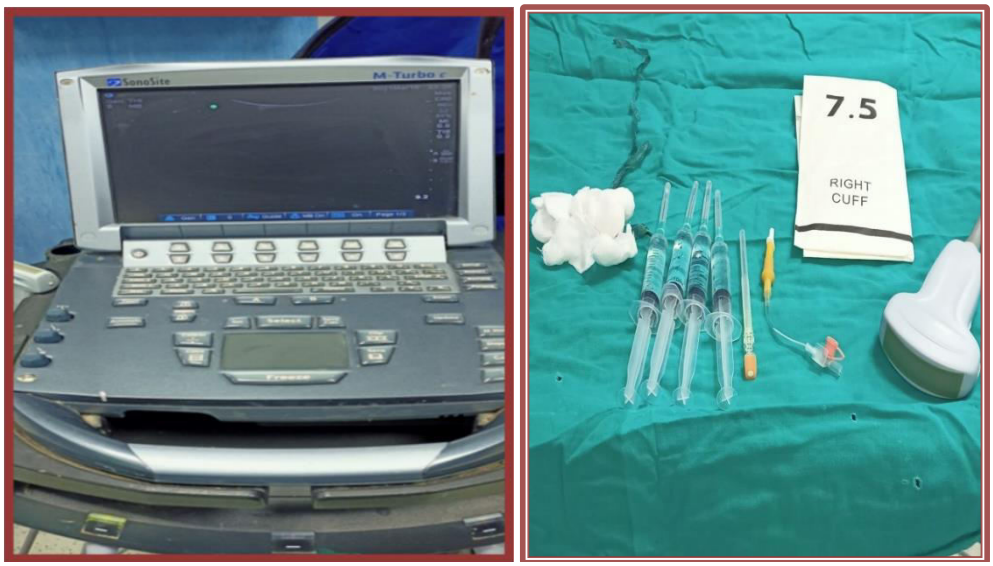

(A) (B)

Figure 1: sterile equipment and drugs used. A: ultrasound machine, B: equipment and drugs used.

Thoracolumbar Interfascial Plane (TLIP) block: While the patient is in the prone position and after sterilization of his back. A curved low-frequency probe was positioned transversally in the midline at the level of L3 to identify the spinous process then the probe was moved slightly lateral to visualize the multifidus (MF) and longissimus thoracis (LT) as in **Fig.2**. Quincke needle (GMS, Egypt) was inserted in plane in a lateral to medial direction through the belly of LT toward the MF when the needle reaches the deep end of the fascial plane between MF and LT close to the SAP, Following negative aspiration, local anaesthetics were injected, and the site was verified using hydro dissection with two ml saline. Following that, 15 ml of 0.25 percent bupivacaine (no epinephrine) was delivered among the fasciae of two muscles. Injection in the correct plane produces a pocket of LA distension that separates the 2 muscles and spreads along the plane as shown in **Fig.3,** then withdraw the needle to inject the remaining 5ml superfascial to the posterior thoracolumbar fascia. The operation was repeated on the other side . The efficacy of the block was evaluated after 20 min .The extent of the sensory block was from T7 – L1 (by pin brick test). Routine general anesthesia was delivered in both groups with propofol 2 mg/kg, fentanyl 1mcg/kg and atracurium 0.5 mg/kg to enable tracheal intubation with an appropriate size cuffed endo-tracheal tube. Anesthesia was maintained with inhalational isoflurane (MAC 1 in O2) and atracurium bolus 0.1 mg/kg. In the Group EAC, at the conclusion of the surgical operation, the same surgical team applied the epidural block.

Epidural At Closure (EAC): After hemostasis, 20 mL of 0.25 percent bupivacaine was injected into the epidural space first before fascia and subcutaneous tissue closure began. To prevent loss of the local anesthetic solution outside the epidural area, the closure operation was performed directly after the epidural anesthesia was administered. Before extubation, patients were given 0.01 mg/kg atropine IV and 0.02 mg/kg neostigmine, and following complete recovery, they were transported to the post anesthesia care unit (PACU) for postoperative treatment and hemodynamic observation. Post-operative analgesia was administered in the formula of I.V paracetamol 1gm/6 hrs.

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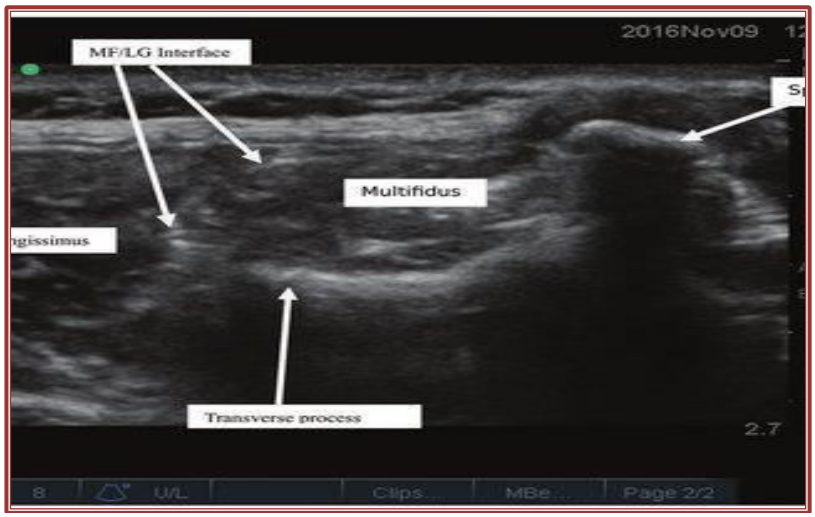

Figure 2: Ultrasound image of multifidus and longissimus thoracis interface

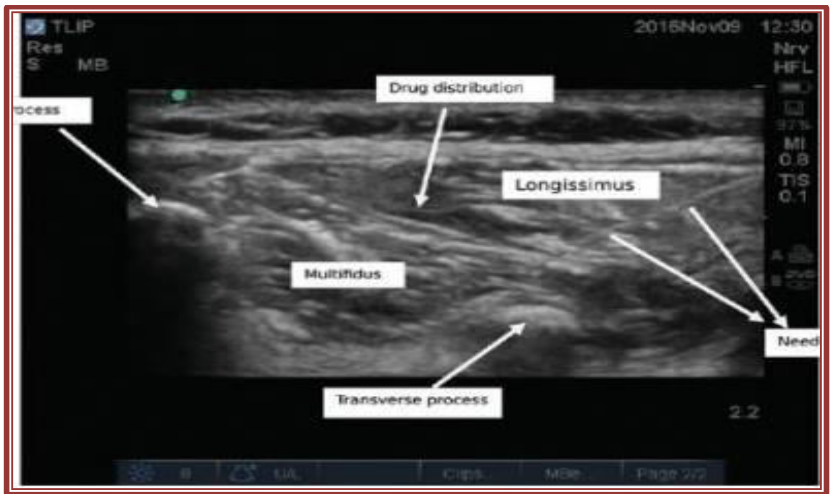

Figure 3: Ultrasound image of TLIP show drug distribution between muscles

Parameters assessed: The following parameters were reported by another physician, has no idea about the patient's group then the collected data were compared between groups.

1. Visual analogue pain score after recovery (rest and movement): Severity of pain was evaluated utlizing Visual Analogue pain scale (VAPS) ranging from 0 to 10. Pain assessment was done post-operative at rest and on movement (walk with the physiotherapist) at the following time intervals 1hr, 2hr, 4hr, 6hr, 8hr, 12hr, 18hr, 24hr.

2. First time for rescue analgesic request: The duration between the end of operation and the 1st patient's demand for analgesia

3. Total analgesic consumption over 1st 24 h: If VAS was ≥ 4 at rest, Intravenous fentanyl was used to provide rescue analgesia (0.5 mcg/ kg) was given. If the analgesia was not adequate (VAS ≥4 for 20 minutes after fentanyl injection) another dose of fentanyl at 0.5 mcg/kg was given and total analgesic requirement of fentanyl were recorded.

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4. OBAS (Overall Benefits of Analgesic Score): It is a7 item questionnaire that evaluates pain severity, opioid –related adverse events (ORAEs) and patient satisfaction.
Evaluate your actual pain at resting on a scale of 0 to 4, with 0 being the least painful and 4 being the most painful. Rate any nausea and discomfort you've had in the last 24 hours. (0=not at all to 4=very much). Please grade any distress and bother from itching in the past 24h (0=not at all to 4=very much). Please rate any sweating-related pain and discomfort you've had in the last 24 hours (0=not at all to 4=very much). Assess any discomfort and bother from freezing in the last 24hours (0=not at all to 4=very much). Asses any discomfort and bother from dizziness in the last 24hour (0=not at all to 4=very much). In the last 24 hours, have you been comfortable with your pain treatment? (0=not at all to 4=very much). Calculated OBAS= (sum total of scores from items 1-6) + (4- score from item 7) low OBAS indicates high benefit of analgesia.
5. Incidence of any complication: Incidence of post-operative complications related to opioids such as postoperative nausea and vomiting, itching, urinary retention, bradycardia and hypotension, respiratory depression and local anesthetic toxicity and technique related complications as hematoma formation at the injection site, vascular or lymphatic injury and neurologic symptoms.
Primary outcomes: Visual analogue pain score during the first postoperatively 24 h and total analgesic consumption over 1st 24 hrs
Secondary outcome: OBAS score**,** time to first post-operative analgesic request, and incidence of any side effect (complications related to the block or side effects of opioids).
Sample size calculation:
Sample size Medcalc ® version 12.3.0.0 program was used for calculation of sample size, statistical calculator based on two sided alpha level of 0.05 (level of significance), beta level of 0.20 (power of 80%), supported by the findings of a prior study by **Celik et al., 2018** and based on the primary outcome variable, visual analogue score, where a significant reduction in VAPS after 4 hours postoperative (3 in T group and 3.43 in E group with standard deviation of 0.5), equal sample sizes in each group, using student t-test, the required sample in each group is 23 individuals. An assumption that up to 10% of patients subsequently would be deemed ineligible and/or have inadequate follow-up. This resulted in a total planned sample size of 25 individuals in each group.
Statistical analysis Data was gathered, edited, validated, and coded before being transferred to a computer for statistical analysis using IBM SPSS version 20**:**. ***Analytical statistics:*** Comparison of independent quantitative data between 3 groups by ANOVA and posthoc test**,** Comparison of categorical data by Chi-squared test ***and*** Intra group comparison by paired sample t-test

Results:

Patient's characteristics are presented in **table (1).** The three groups were comparable regarding age, sex, ASA, operative time and the level of laminectomy with no statistically significant difference.
As regarding intra operative hemodynamics: there were significant decline in intraoperative HR and MAP in the three groups in comparison to the basal values at all-time intervals of recordings, except after induction as shown in **table (2).** Regarding inter-group HR comparison, TLIP group showed significantly decrease in mean HR from 10 min till end of operation when compared to epidural group and control group. Regarding MAP, Also, in comparing TLIP group with epidural and control group, a significant lower reading in TLIP group was recorded from 20 min till the end of operation. However, on comparison epidural group and control group, there were statistically insignificant results as regarding mean HR and MAP as in **table(3).**

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The VAPS in control group was significantly higher at all times except at 24 h postoperative, while in TLIP group and E group VAPS was higher in comparison with the baseline only from 4 h - 18h postoperative. As regard intergroup comparison, the median VAPS score at rest was a considerable reduction in TLIP group than control group during 12 h postoperative, while in comparison with E group VAPS was significantly lower from 4h to 12h. E group showed a considerable reduction median VAPS than control group during first 4h postoperative as shown in **table (4).**

The TLIP group had considerably reduced dynamic VAPS in the first 12 h of the observing day when compared with control group, while it was significantly lower than epidural group from 4h to 12h. E group showed significantly lower median VAPS than control group during the first 2h postoperative as illustrated in **table (5).**

The mean time to 1st analgesic request was substantially more time in TLIP group than epidural group, while the control group showed the shortest time to 1st analgesic request. As regard the mean cumulative fentanyl consumption during the first 24 h postoperative, it was notable higher in control group than epidural groups, while TLIP group showed the lowest opioid consumption as shown in **table (6).**

OBAS score is a7 item questionnaire that evaluate pain intensity, opioid –related adverse events (ORAE) and patient satisfaction. The total score was a considerable reduction in TLIP group than epidural and control group while the control group showed the highest total score which means that TLIP group has the best patient satisfaction and the least complication as shown in **table (7)**.

Table (1): Data on the demographics of the groups studied

	Group T N=25	**Group E N=25**	**Group C N=25**	**p-value**			
				All	T&E	T&C	E&C
Age Mean ±SD	51.9±7.0	50.8±10.7	47.5±9.8	0.226	0.662	0.097	0.219
Sex: N (%) Males Females	14(56%) 11(44%)	13(52%) 12(48%)	12(48%) 13(52%/* +859+639)	0.852	0.777	0.572	0.777
ASA: N (%) I II	17(68%) 8(32%)	16(64%) 9(36%)	18(72%) 7(28%)	0.832	0.765	0.758	0.544
Duration of surgery(min) Mean ±SD	146.4±23.6	141.8±25.6	137.4±27.7	0.469	0.529	0.220	0.547
Level of laminectomy							
L1-2	2(8%)	4(16%)	2(8%)				
L2-3	5(20%)	6(24%)	6(24%)	0.695	0.418	0.748	0.469
L3-4	7(28%)	7(28%)	8(32%)				
L4-5	7(28%)	6(24%)	6(24%)				
L5-S1	4(16%)	2(8%)	3(12%)				

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P-value is considered important at <0.05.

Table (2): Intraoperative mean HR changes in studied groups, Values displayed as mean and standard deviation (SD)

	Group T N=25	**Group E N=25**	**Group C N=25**	**p-value**			
	Mean ±SD	Mean ±SD	Mean ±SD	All	T&E	T&C	E&
Preoperative(basal)	93.60±6.4	94.76±6.7	91.88±7.0	.324	.547	.372	.1
After induction	94.40±7.0	96.12±7.2***	94.28±6.7	.587	.390	.952	.3
After 5min	92.64±5.1	93.20±7.2***	90.72±6.5	.359	.757	.291	.1
After 10min	83.6±6.2***	90±7.4***	90.8±6.2	<0.001	.001	<0.001	.1
After 20min	82.64±7.7***	89.48±7.4***	89.00±7.4***	.003	.002	.004	.8
After 30min	80.72±5.8***	88.24±6.5***	88.00±6.3***	.000	<0.001	<0.001	.8
After 45min	76.44±7.4***	87.64±5.2**	86.60±4.9**	.000	<0.001	<0.001	.5
After 60min	74.56±7.9***	85.28±6.4***	85.96±4.6**	.000	<0.001	<0.001	.7
After 90min	74.20±6.5***	90.76±6.6***	87.44±5.3*	.000	<0.001	<0.001	.0
After 120min	72.60±6.3***	91.88±5.6***	91.00±4.8	.000	<0.001	<0.001	.5

P-value is considered significant at <0.05
***: very high significant intragroup comparison at <0.001
**: highly notable intragroup comparison at <0.01
*: important intragroup comparison at <0.05

Table (3): Intraoperative MAP (mmHg) changes in studied groups. Values displayed as mean and standard deviation.

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	Group T N=25	Group E N=25	Group C N=25	p-value			
	Mean ±SD	Mean ±SD	Mean ±SD	All	T&E	T&C	E&C
Preoperative	94.92±9.8	95.72±7.8	95.72±7.8	.930	.743	.777	.977
Induction	97.28±10.1	97.08±7.8	97.06±7.8	.996	.935	.900	.989
After 5min	91.28±8.7***	91.96±8.0***	93.32±7.4***	.663	.767	.375	.553
After 10min	90.36±7.2***	91.92±6.4*	91.96±8.0***	.676	.450	.439	.985
After 20min	85.52±5.0***	89.20±6.5***	89±5.9***	.066	.030	.035	.738
After 30min	79.28±8.1***	88.28±7.5***	87.52±7.2***	.000	<0.001	<0.001	.728
After 45min	78.24±7.8***	86.24±6.7***	86.92±7.6***	.000	<0.001	<0.001	.748
After 60min	77.04±7.3***	88.04±6.5***	85.40±7.7***	.000	<0.001	<0.001	.201
After 90min	76.56±7.1***	89.92±6.5***	92.20±6.3***	.000	<0.001	<0.001	.232
After 120min	75.52±5.7***	91.16±5.5***	92.80±5.4***	.000	<0.001	<0.001	.302

P-value is considered significant at <0.05.
***: significant intragroup comparison at <0.001
**: significant intragroup comparison at <0.01
*: significant intragroup comparison at <0.05.

Table (4).Visual analogue pain score at rest.

	Group T N=25	Group E N=25	Group C N=25	p-value			
	Mean ±SD	Mean ±SD	Mean ±SD	All	T&E	T&C	E&C
At rest 1st hour	1.5±.5	1.6±.6	2.8±.6	<0.001	.650	<0.001	<0.001
2nd hour	1.6±.7	1.7±.7	3.5±.6*	<0.001	.563	<0.001	<0.001
4th hour	2.0±.9***	2.8±.8***	3.9±.6***	<0.001	.001	<0.001	<0.001
6th hour	2.6±.7***	3.9±.7***	4.0±.8***	<0.001	<0.001	<0.001	.723
8th hour	2.8±1***	4.1±1.03***	4.4±.9***	<0.001	<0.001	<0.001	.317
12th hour	3.2±.8***	4.7±.8***	4.8±.7***	<0.001	<0.001	<0.001	.859
18th hour	2.5±.5***	2.8±.6***	2.8±.7	.116	.059	.092	.832
24th hour	1.8±.5	1.8±.6	1.9±.7	.662	.650	.365	.676

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Table (5).Visual analogue pain score at movement.

	Group T N=25	Group E N=25	Group C N=25	p-value			
	Mean ±SD	**Mean ±SD**	**Mean ±SD**	**All**	**T&E**	**T&C**	**E&C**
Active 1st hour	**1.8±.6***	**1.8±.6**	**3.4±.7***	**<0.001**	**.840**	**<0.001**	**<0.001**
2nd hour	**2.0±.7****	**2.3±.8****	**3.5±.7****	**<0.001**	**.151**	**<0.001**	**<0.001**
4th hour	**2.4±.8*****	**3.8±.6*****	**4.1±.7*****	**<0.001**	**<0.001**	**<0.001**	**.187**
6th hour	**3.0±.8*****	**4.7±.7*****	**4.8±.7*****	**<0.001**	**<0.001**	**<0.001**	**.859**
8th hour	**3.6±.8*****	**5.0±.7*****	**5.5±1.0*****	**<0.001**	**<0.001**	**<0.001**	**.039**
12th hour	**3.9±.7*****	**4.8±1*****	**4.9±.9*****	**<0.001**	**.001**	**<0.001**	**.643**
18th hour	**3.7±.4*****	**3.9±.6*****	**3.8±.7*****	**.661**	**.365**	**.650**	**.667**
24th hour	**3.2±.8*****	**3.1±.6*****	**3.2±.7***	**.978**	**.856**	**.990**	**.877**

Table (6): time of first analgesic request (hour) and total fentanyl consumption (mic) among studied groups.

	Group T N=25	**Group E N=25**	**Group C N=25**	**p-value**			
	Mean ±SD	Mean ±SD	Mean ±SD	All	T&E	T&C	E&C
time of first analgesic request (hour)	11.52±4.33	5.60±1.15	3.36±1.22	<0.001	<0.001	<0.001	0.004
total fentanyl consumption (mic)	44.20±12.39	114.00±23.80	160.80±32.82	<0.001	<0.001	<0.001	<0.001

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Table (7): OBAS score among studied groups.

	Group T N=25	Group E N=25	Group C N=25	p-value			
	Mean ±SD	Mean ±SD	Mean ±SD	All	T&E	T&C	E&C
Pain (0-4)	1.12±.3	2.08±.5	2.8±.5	<0.001	<0.001	<0.001	<0.001
Vomiting (0-4)	0±0	.04±.2	.08±.2	.363	.476	.156	.466
Itching	0±0	0±0	0±0	-			
Sweating	0±0	0±0	0±0	-			
Shivering	0±0	.04±.2	0±0	.373	.225	1.000	.225
Dizziness	0±0	0±0	0±0	-			
Patient satisfaction	3.6±.4	2.5±.7	1.04±.5	<0.001	<0.001	<0.001	<0.001
Total score	1.44±.6	3.72±.84	5.92±.86	<0.001	<0.001	<0.001	<0.001

Quantitative data displayed as mean and standard deviation (SD), p-value is considered significant at <0.05.

Discussion:

The displacement of disc material (nucleus pulposus) beyond the intervertebral disc space due to atear or injury in the annulus fibrosus is referred to as disc herniation (DH). Lumbar disc herniation (LDH) is the most common reason of morbidity, and management is expensive. Each year, roughly 5- 20 occurrences of herniated disc occur in 1000 persons. LDH is found in 1–3% of the population in Finland and Italy, according to Jordon. In the 30–59 year age bracket, men have a 2-multiple higher rate than women **(5).** Patients who have lumbar discetomy or lamenectomy surgery may experience minimal postoperative analgesia, resulting in delayed mobilization, a higher risk of thrombosis, and a longer hospital stay. Furthermore, if the pain is not decreased to manageable levels in the early stages, chronic pain might develop **(6).** Despite the fact that the number of spine procedures conducted has risen in latest years, the opportunities for postoperative pain management have remained restricted. Throughout a thoracolumbar interfascial plane (TLIP) block, a local anaesthetic medicine is administered into the fascial plane in between multifidus and longissimus muscles at the approximate level of the third lumbar vertebra. So when thoracolumbar nerves go through the paraspinal musculature, their dorsal rami have been observed to be anesthetized**(4).**

The primary goal of this study was to examine the result of thoracolumbar interfascial plane block (the classic approach) vs. epidural analgesia in lumber spine procedures when administered with general anesthesia.

This prospective, randomized, double blind, controlled study was conducted in Minia University Hospital in the period from June 2018 to June 2020. 75Patients were allocated randomly into three equal groups (25 patients in each group) by computer- generated randomization tables as follow: Group I (group T): ultrasound guided TLIP block was performed with 40 ml bupivacaine 0.25% (20 ml on each side) before induction of general anesthesia. Group II (group EAC): (Epidural at Closure) Epidural injection of 20 ml of bupivacaine 0.25% at the completion of the operation by the surgeon just before wound

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closure. Group III (group C): Only general anesthesia was used on the patients as a control group.

The TLIP block's effectiveness for lumbar laminoplasty has been studied retrospectively, and **Ueshima et al**. **(7)** discovered that using the conventional technique of the TLIP block provided 24 hours of good analgesia after single-level spine surgery. However, this is only useful for single-level spinal surgery; the TLIP block's efficiency for multi-level spinal surgery is unknown. **Ohgoshi et al. (8)** documented 2 cases of multi-level lumbar surgery in which they used the conventional strategy to conduct TLIP block. This block is also helpful for multi-level spinal surgery, according to the authors. **Ahiskalioglu et al. (9)** stated that a lateral approach could be advantageous for 2- or 3 -level spine operations when using a mTLIP block. **Ye et al. (10)** published a meta-analysis that indicated that TLIP block improved analgesic effects in spine surgery when in comparison to non-block care in nine randomized controlled studies with 539 individuals.

There were no substantial change among the 3 groups when it comes to age, sex, ASA, operation time, or laminectomy level in our study, Our findings were consistent with those of **Celik et al. (11**) who indicated that 30 patients were participated in the mTLIP group and 31 patients in the EAC group in their study, Due to a change in surgical method, one patient in the EAC group was removed from the research

The data from the mTLIP and EAC groups (30 patients in each) were statistically analyzed There was no noticeable difference between the groups regarding age, gender, surgery level, or operation duration ($p > 0.05$). There were no statistically meaningful intergroup variations regarding age, weight, length, American Society of Anesthesiologists status, duration of anesthesia, duration of surgery, and surgical level ($p>0.05$), according to **Ekinci et al. (12).** This study comprised 60 patients who were separated into 2 groups, each with 30 patients: a TLIP block group (group T) and a wound infiltration group (group W).

The current study found that when it came to the Visual analogue pain scale score (VAPS) at rest, the VAPS in the control group was substantially higher at all times except at 24 h postoperative, whereas the VAPS in the TLIP group and E group was higher only from 4 h to 18 h postoperative in comparison to the baseline. The median VAPS score at rest was considerably lower in the TLIP group than in the control group for the first 12 hours after surgery, and was considerably lower in the E group from 4 to 12 hours. During the first four hours after surgery, the E group had considerably lower median VAPS than the control group. In terms of the Visual analogue pain score (VAPS) on movement, the VAPS active (during movement) was substantially greater in the 3 groups than the basal VAPS. However, in the first 12 hours of the observation day, dynamic VAPS was considerably lower in the TLIP group than in the control group, and it was significantly lower in the epidural group from 4 to 12 hours. During the first 2 hours after surgery, the E group had considerably lower median VAPS than the control group.

Our findings were backed up by a study by **Celik et al., (11**) who found that in the postoperative recovery room following surgery, there was no substantial distinction between the mTLIP and EAC Groups regarding of VAS scores in the first and second postoperative hours ($p > 0.05$), but the VAS scores at the fourth, eighth, twelve hours, and twenty-fourth hours were

statistically substantially lower in the mTLIP Groups ($p < 0.05$).

In a research by **Ueshima et al., (7)** the T (TLIP) group had lower pain scores at 1, 2, 4, and 24 hours postoperatively than the G (general anesthesia) group. When compared to non-block treatment, TLIP block considerably lowered postoperative pain severity at resting or activity at various time points, according to **Ye et al., (10)** Furthermore, **Ammar & Taeimah (13)** discovered that the TLIP group demonstrated a substantial reduction in the postoperative VAS for pain score on both resting and activity when compared to the control group . During

ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 03, 2021

movement, there was a significant reduction in the postoperative VAS in TLIP group, while at 24 hr, there was no statistically significant difference between the groups.

Ozmen et al., (14), Chen et al., (15) stated that the TLIP block significantly reduced pain intensity at rest at all time points postoperatively compared with non-block care group: at 1–2 h. **Ueshima et al., (16), Ciftci et al., (17)** revealed that when compared to non-block care, the TLIP block dramatically reduced pain levels during activity at all postoperative time points.

In a study conducted by **Ekinci et al.,(12)** the VAS scores for pain throughout movement and while at resting were meaningfully reduced in group T than those in group W 8 h after the surgery ($p<0.05$).

In the study in our hands, as regard Time of first analgesic request and total fentanyl requirement: The mean time to 1st analgesic request was significantly longer in TLIP group (11.52±4.33) than epidural group (5.60±1.15), which is longer than control group, and the control group showed the shortest time to 1st analgesic request (3.36±1.22). As regard the mean cumulative fentanyl consumption during the first 24 h postoperative, it was significantly higher in control group (160.80±32.82) than epidural (114.00±23.80) and TLIP (44.20±12.39) groups, whereas TLIP group showed the lowest opioid consumption. As regard OBAS (Overall Benefits of Analgesic Score): OBAS score is a7 item questionnaire that assess pain intensity, opioid –related adverse events (ORAE) and patient satisfaction. The total score was significantly lower in TLIP group than epidural and control group while the control group showed the highest total score which means that TLIP group showed lower incidence of ORAE (nausea, vomiting, itching and hypotension) and better patient satisfaction than epidural and control group.

It was found that there was a statistically significant difference between the groups in the study conducted by **Celik et al. (11)** who observed that additional rescue analgesics were required in eleven patients from the EAC Group and three patients from the mTLIP Group, and that the difference was found between the groups ($p <0.05$). Following the procedure, an examination of the postoperative complications revealed that neither group experienced respiratory depression, sedation/confusion, or somnolence. Despite the fact that there was no statistically significant variation groups regarding opioid intake between the first and fourth hours postoperatively ($p > 0.05$), the total opioid consumption in Group mTLIP was considerably reduced between the fourth and twelfth hours and between the twelveth and twenty-first hours between the fourth and twenty-first hours (p less than 0.05).

The combined data from the **Ozmen et al. (14)** and **Chen et al. (15)** trials revealed that TLIP block considerably decreased the incidence of rescue analgesic needed when compared to the non-block group

According to **Ye et al.**, **(10)** TLIP block considerably decreased postoperative nausea and vomiting (RR 0.58; 95%CI 0.39, 0.86; $p = 0.006$; $I2 = 25.1\%$). Besides, TLIP block is superior to wound infiltration regarding opioid intake (WMD -17.23, 95%CI -21.62, -12.86; $p<0.001$; $I2 = 63.8\%$), and the postoperative pain severity at resting was comparable between TLIP block and wound infiltration.

Furthermore, **Ammar & Taeimah, (13)** confirmed that the first time of demands for analgesic was considerably shorter in the control group compared to the TLIP group (82.00 ± 69.01 vs. 442.7 ± 126.47 min, $P < 0.001$). At the end of 24 h, total morphine intake was assessed, in which TLIP group had lower cumulative morphine consumption than the control group of a statistically important variation (9.7 ± 6.38 vs. 25.88 ± 5.17 mg, $P < 0.001$). TLIP block group compared with the control group demonstrated a statistically significant decrease of nausea and a lower occurrence of sedation. No cases of vomiting were recorded in both groups.

ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 03, 2021

CONCLUSION:

In lumbar discectomy, thoracolumbar interfascial plane block has been associated with less opioid consumption ,less pain scores and more patient satisfaction compared with the application of epidural anesthesia at closure in patients. We consider that thoracolumbar interfascial plane block constitutes a suitable alternative for postoperative analgesia in lumbar discectomy, and should be used as a part of balanced analgesia.

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