

# Comparison between External Oblique Intercostal Plane Block (EOI) and Pre-Incisional Local Infiltration on Intra and Acute Post-Operative Pain Control in Adult Patients Undergoing Bariatric Surgeries: Randomized Controlled Prospective Comparative Study

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## Abstract

**Background:** Bariatric surgeries can cause severe pain in intra and postoperative period which can cause serious suffering to adult obese patients, prolong recovery, and increase opioids consumption which have a lot of risks and side effects such as respiratory depression, constipation, dizziness and dependency, Thus we used External oblique intercostal plane block as a method to reduce intraoperative and postoperative pain and opioids consumption compared to preincisional local infiltration.

**Aim of Study:** Comparing the efficacy of External Oblique Intercostal plane block with Preincisional local infiltration in intraoperative and acute post operative pain control in adult patients aged from 21-60 years underwent bariatric surgeries at Souad Kafafi Hospital.

**Patients and Methods:** After approval of scientific and ethical committees, 72 adults aged 21-60 years submitted to General Anaesthetics in Souad Kafafi Hospitals were enrolled in this study from October 2022 to April 2023. Adults were allocated in two groups: Group (A) which receive External Oblique Intercostal plane block and Group (B) which receive Preincisional local infiltration, intraoperative haemodynamics (HR, Mean Bp, Spo2) and fentanyl consumption were calculated after induction of General Anaesthesia, post operative VAS score and Morphine consumption were recorded.

**Results:** External Oblique Intercostal plane block was efficient to reduce intra and postoperative pain and opioids consumption in 77.7% of patients, while preincisional local infiltration was efficient in only 44.4% of patients.

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**Conclusion:** External Oblique Intercostal plane block provided better analgesia and pain control as compared to preincisional local infiltration in intra and post operative period.

**Key Words:** *Transversus abdominis plane – External oblique intercostal.*

## Introduction

PAIN in the postoperative period can cause serious suffering to patients, prolong recovery, and increase healthcare costs [1]. However, postoperative pain management can be a major challenge as previous studies demonstrated that it is frequently suboptimal [2,3,4].

Bariatric surgeries are considered minimally invasive (laparoscopic), but they can cause severe pain [5,6]. Opioids are excellent analgesics, but they have several side effects such as respiratory depression, which may further complicate pain management in weight loss surgeries, particularly in cases with obstructive sleep apnea [7]. Other comorbidities such as diabetes mellitus and cardiovascular diseases that are common in patients with obesity can also lead to difficulties with pain management [8]. This complexity highlights the importance and the challenges of the optimal choice of analgesia in bariatric surgery.

Upper abdominal incisions such as the oblique subcostal laparotomy are a cause of severe pain and can lead to significant respiratory impairment [9].

Current best practice includes performance of neuraxial or regional anaesthesia [10].

Enhanced Recovery After Surgery (ERAS) protocols are created to facilitate faster recovery after surgery multimodal analgesia [11]. Although growing evidence supports multimodal analgesic techniques in clinical practice, opioids still remain among the first choice of postoperative pain management [12].

Besides pharmacological analgesia, locoregional analgesic techniques are also among the alternatives. After decades of being the “gold standard,” large meta-analysis and trials reported controversial effects of epidural analgesia on mortality and morbidity associated with frequent technical failures [13,14]. As an alternative to epidural analgesia, infiltrative techniques including transversus abdominis plane block (TAP block) has gained increasing attention in recent years as they can be safely and easily applied [15].

However, there are many limitations to the use of these techniques, particularly in obese patients. These include technical difficulties associated with the depth of the anatomical target site, proximity to the operative field, and infection- or coagulation-related contraindications. We have found the recently described external oblique intercostal (EOI) plane block [16,17].

To be a simple, effective, and convenient block, particularly in the context of morbid obesity.

Therefore, this meta-analysis was conducted to compare between the efficacy of the newly discovered external oblique intercostal block which covers the area of both upper quadrants of the abdomen including the midline area, and preincisional local infiltration on intra and acute post-operative pain control in patients undergoing bariatric surgery.

#### *Aim of the work:*

The aim of this study was to investigate the efficacy of external oblique intercostal block using bupivacaine compared to pre-incisional local infiltration with local anaesthetic agent (bupivacaine and lidocaine) on intra and acute post-operative pain control in adult patients undergoing bariatric surgery.

### **Patients and Methods**

*Ethical considerations:* This study was conducted at the Memorial Hospital of Souad Kafafi during November 2022 to April 2023. Approval of research ethical committee was taken in October 2022 at the number of (FWA0002557/2022). Informed written consents were obtained from all patients enrolled in this study.

#### **Methods:**

*Study design:* Randomized Controlled comparative study.

*Study setting and location:* The study was conducted at Surgery Theater at Souad Kafafi University Hospital-Misr University of science and Technology (MUST).

*Study population:* Patients aged from 21 to 60 years old scheduled for bariatric surgery.

Subjects presenting for bariatric surgery were randomized in a 1:1 ratio to either: Group A: Receiving an ultrasound-guided bilateral external oblique intercostal plane block using mixture of 0.25% bupivacaine and 1% lidocaine. Group B: Receiving a pre-operative local wound infiltration with a local anaesthetic agent using mixture of 0.25% bupivacaine and 1% lidocaine.

#### *Eligibility criteria:*

*Inclusion criteria:* Patients scheduled for bariatric surgery. >21 years old and below 60 years old. American society of anesthesia (ASA) classification I and II. (i.e. ASA classification I: A normal healthy patient, for example: No chronic disease, non-smoking, no or minimal alcohol consumption, BMI <30). ASA classification II: Patients with mild systemic disease, for example: Well controlled diabetes/hypertension, smokers, obesity (30 < BMI <35). Ability to sign the consent.

*Exclusion criteria:* <21 years old and above 60 years old. Refusal to participate. Chronic opioid use (addicts, cancer patients receiving palliative treatment). ASA classification III: Patient with severe systemic disease, for example: Poorly controlled diabetes/hypertension, chronic obstructive pulmonary diseases (COPD) (chronic bronchitis and asthma), hepatitis, morbid obesity with (BMI >35) and ASA IV: patients with life threatening medical condition, for example: recent myocardial infarction, sepsis, severe cardiac valve dysfunction. Seizure disorder (upper motor neuron lesion, brain tumors, cerebral palsy, systemic lupus erythematosus). Allergy to local anaesthetics (allergy to lidocaine and bupivacaine). Severe hepatic disease (acute hepatitis, fulminant hepatitis, chronic liver failure, cirrhosis, Hepatocellular carcinoma). Rib cage abnormalities (deformities as pigeon chest and funnel chest, fractures).

#### *Study procedures:*

*Randomization:* Patients were randomly allocated by a computer-generated table into one of the two study groups; the randomization sequence was concealed in sealed opaque envelopes.

*Study protocol:* Following approval from research and ethics committee of anesthesia department, Faculty of Medicine, MUST University, All Patients had a pre-operative assessment visit, which included; history taking, complete physical examination and review of all the results of the routine investigations (CBC, coagulation profile, renal func-

tions, liver functions, electrolytes). On Arrival to the preparation room, they received the following pre-medication via intravenous (IV) route: Midazolam 0.03mg/kg, Metoclopramide 10mg & granisetron 1mg. Upon Arrival to the operating room, the standard Monitoring were applied which include: Pulse Oximeter, Noninvasive Blood Pressure & Six-leads electrocardiogram (ECG). The General Anaesthesia was induced using: Propofol 1-2mg/kg, Fentanyl 1-2µg/kg and Atracurium 0.5mg/kg. General anaesthesia was maintained using Sevoflurane 1MAC (Mean Alveolar Concentrations) which is the alveolar concentrations at which 50% of patients don't respond to standardized stimulus as surgical stimulus, Incremental doses of Atracurium 0,1mg/kg.

#### Group A:

Aseptic technique done by wearing sterile gown and sterile gloves, Then, the skin was sterilized using chlorhexidine. The location of the sixth rib was found using a counting down approach from the first rib under ultrasonography [Mindray, Model: DC-N2] and marked on the skin. After placing a 5–12 MHz linear probe over chest wall on the sixth rib just medial to the anterior axillary line parasagittal in orientation, the needle (which is 18 gauge cannula needle) was advanced through the skin from cephalad to caudad. We saw by the ultrasound the external oblique muscle which is the only superficial structure to the chest wall (ribs) at this area. Then, we injected 29ml of 0.25% bupivacaine and 1% Lidocaine below the external oblique muscle until it was well-lifted by the local anaesthetic agent. During intra-operative monitoring, unexplained increase in hemodynamics (when the mean blood pressure, heart rate or both increased by more than 20% from the baseline) denoted that the patient was in pain and the block has been failed. So, Fentanyl incremental doses (0.5µg/kg) were given.

#### While in group B:

We stuck to pre-incisional local infiltration with a local anaesthetic agents using mixture of (0.25% bupivacaine and 1% lidocaine) Unexplained increase in hemodynamics (when the mean blood pressure, heart rate or both increased by more than 20% from the baseline) denoted that the patient was in pain. So, Fentanyl incremental doses (0.5µg/kg) were given. The Visual Analogue Scale (VAS) consists of a 10cm line anchored by 2 extremes of pain. The extremes are 'no pain' and 'pain as bad it could be.' Patients are asked to make a mark on the line which represents their level of perceived pain intensity, and the scale is scored by measuring the distance from the 'no pain' end to the patient's mark [18]. All the patients have been educated about the VAS score.

Study outcomes:

#### Primary outcome measures:

Morphine Consumption: Total morphine consumption. [Time Frame: 0-12Hours post operative].

#### Secondary outcome measures:

Intraoperative fentanyl consumption. Measuring Hemodynamics (Mean Arterial Blood Pressure, Heart rate) at: T0 (Before induction of general Anesthesia, T1 (Before Starting the Block), T2 (20 minutes after doing the block) and T3 (end of surgery). Pain scores [Time Frame: 0-12 Hours post operative, every 2 hours for the first 6 hours, then every 3 hours for the following 6 hours]. Numerical Rating Scale Pain Scores (Range: 0-10, where 0 is no pain and 10 is the worst pain). Opioid-Related Adverse Events [Time Frame: 0-12 Hours]. Nausea, Vomiting, Pruritis, Respiratory Depression, Constipation

#### Statistical analysis:

The collected data were coded, tabulated, and statistically analyzed using IBM SPSS statistics (Statistical Package for Social Sciences) software version 28.0, IBM Corp., Chicago, USA, 2021. Quantitative data tested for normality using Shapiro-Wilk test, then described as mean ± SD (standard deviation) as well as minimum and maximum of the range, and then compared using independent *t*-test. Qualitative data described as number and percentage, and then compared using Chi square test. The level of significance was taken at *p*-value <0.050 was significant, otherwise was non-significant.

## Results

Table (1): Demographic characteristics among the study groups.

Variables	Measures	Group-A (N=36)	Group-B (N=36)	<i>p</i> -value
Age (years)	Mean ± SD	41.5±9.8	40.3±9.7	^0.606
	Range	22.0–55.0	21.0–55.0	
Gender (n, %)	Male	17 (47.2%)	14 (38.9%)	#0.475
	Female	19 (52.8%)	22 (61.1%)	
BMI (kg/m <sup>2</sup> )	Mean ± SD	37.7±4.0	38.4±4.5	^0.526
	Range	31.0–45.0	31.0–47.0	
Operation duration (minutes)	Mean ± SD	45.0±5.9	46.3±6.3	^0.354
	Range	26.0–55.0	29.0–56.0	

BMI: Body mass index.

^Independent *t*-test.

#Chi square test.

- Data are expressed as mean ± standard deviation (SD), numbers and percentage (%). *p*≤0.05 is significant.

Table (2): Intraoperative heart rate (beat/minute) among the study groups.

Time points	Measures	Group-A (N=36)	Group-B (N=36)	p-value
T0	Mean $\pm$ SD Range	77.9 $\pm$ 8.1 62.0–92.0	77.2 $\pm$ 8.0 62.0–93.0	$\wedge$ 0.683
T1	Male Female	72.8 $\pm$ 7.4 60.0–85.0	71.0 $\pm$ 7.4 60.0–84.0	$\wedge$ 0.291
T2	Mean $\pm$ SD Range	73.1 $\pm$ 11.6 50.0–99.0	77.0 $\pm$ 12.1 50.0–99.0	$\wedge$ 0.162
T3	Mean $\pm$ SD Range	72.1 $\pm$ 18.5 50.0–110.0	83.2 $\pm$ 19.7 50.0–110.0	$\wedge$ 0.016*

$\wedge$ Independent *t*-test.

Data are expressed as numbers and percentage (%).  
 $p \leq 0.05$  is significant.

Table (3): Intraoperative mean blood pressure (mmHg) among the study groups.

Time points	Measures	Group-A (N=36)	Group-B (N=36)	p-value
T0	Mean $\pm$ SD Range	84.3 $\pm$ 6.8 72.0–95.0	82.4 $\pm$ 6.2 73.0–94.0	$\wedge$ 0.230
T1	Male Female	78.6 $\pm$ 6.2 68.0–88.0	76.8 $\pm$ 5.5 68.0–86.0	$\wedge$ 0.197
T2	Mean $\pm$ SD Range	76.8 $\pm$ 7.2 64.0–90.0	82.6 $\pm$ 7.5 68.0–97.0	$\wedge$ 0.001*
T3	Mean $\pm$ SD Range	76.6 $\pm$ 14.1 58.0–105.0	87.8 $\pm$ 10.8 65.0–105.0	$\wedge$ <0.001*

$\wedge$ Independent *t*-test.

Data are expressed as numbers and percentage (%).  
 $p \leq 0.05$  is significant.

Table (4): Intraoperative SPO2 (%) among the study groups.

Time points	Measures	Group-A (N=36)	Group-B (N=36)	p-value
T0	Mean $\pm$ SD Range	95.8 $\pm$ 0.8 94.0–97.0	95.5 $\pm$ 0.7 94.0–97.0	$\wedge$ 0.113
T1	Male Female	97.4 $\pm$ 0.7 96.0–98.0	97.4 $\pm$ 0.7 96.0–98.0	$\wedge$ 0.609
T2	Mean $\pm$ SD Range	97.9 $\pm$ 0.3 97.0–98.0	97.9 $\pm$ 0.4 97.0–98.0	$\wedge$ 0.460
T3	Mean $\pm$ SD Range	98.0 $\pm$ 0.2 97.0–98.0	97.9 $\pm$ 0.2 97.0–98.0	$\wedge$ 0.562

$\wedge$ Independent *t*-test.

Data are expressed as numbers and percentage (%).  
 $p \leq 0.05$  is significant.

Table (5): Total intraoperative fentanyl consumption ( $\mu$ g/kg) among the study groups.

Measures	Group-A (N=36)	Group-B (N=36)	p-value
Mean $\pm$ SD Range	1.26 $\pm$ 0.35 1.00–2.20	1.44 $\pm$ 0.36 1.00–2.10	$\wedge$ 0.032*

$\wedge$ Independent *t*-test. \*Significant.

Data are expressed as numbers and percentage (%).  
 $p \leq 0.05$  is significant.

Table (6): Postoperative pain (VAS-10) among the study groups.

Time points	Measures	Group-A (N=36)	Group-B (N=36)	p-value
Hour-2	Mean $\pm$ SD Range	1.9 $\pm$ 1.8 0.0–7.0	2.9 $\pm$ 1.8 0.0–7.0	$\wedge$ <0.001*
Hour-4	Male Female	2.8 $\pm$ 2.0 0.0–7.0	4.2 $\pm$ 2.0 1.0–8.0	$\wedge$ <0.001*
Hour-6	Mean $\pm$ SD Range	4.0 $\pm$ 2.3 0.0–9.0	5.5 $\pm$ 2.3 2.0–10.0	$\wedge$ <0.001*
Hour-9	Mean $\pm$ SD Range	5.1 $\pm$ 2.4 1.0–10.0	6.5 $\pm$ 2.3 3.0–10.0	$\wedge$ <0.001*
Hour-12	Mean $\pm$ SD Range	6.1 $\pm$ 2.3 2.0–10.0	7.5 $\pm$ 2.0 4.0–10.0	$\wedge$ 0.030*

$\wedge$ Independent *t*-test. \*Significant.

Table (7): Total postoperative 12-hour morphine consumption (mg/kg) among the study groups.

Measures	Group-A (N=36)	Group-B (N=36)	p-value
Mean $\pm$ SD Range	0.027 $\pm$ 0.031 0.000–0.100	0.053 $\pm$ 0.031 0.000–0.100	$\wedge$ <0.001*

$\wedge$ Independent *t*-test. \*Significant.

Data are expressed as numbers and percentage (%).  
 $p \leq 0.05$  is significant.

Table (8): Intraoperative and postoperative side effects among the study groups.

Side effects	Group-A (N=36)	Group-B (N=36)	p-value
Respiratory depression	10 (27.8%)	15 (41.7%)	#0.216
Nausea	17 (47.2%)	20 (55.6%)	#0.479
Vomiting	15 (41.7%)	17 (47.2%)	#0.635
Constipation	12 (33.3%)	16 (44.4%)	#0.334
Toxicity	0 (0.0%)	0 (0.0%)	NA
Pneumothorax	0 (0.0%)	0 (0.0%)	NA

NA: Not applicable. # : Chi square test.

\* : Data are expressed as numbers and percentage (%).  
 $p \leq 0.05$  is significant.

## Discussion

Bariatric surgeries are currently considered the most effective treatment option for morbid obesity; it results in greater improvement in weight loss outcomes and obesity-related comorbidities when compared with non-surgical interventions, regardless of the type of surgical procedure used [19,20]. Different surgical options are available, and they are continuously evolving, influenced by literature results, specific local conditions, and the experience of the surgical staff in each country.

Pain in the postoperative period can cause serious suffering to patients, prolong recovery, and increase healthcare costs [1]. However, postoperative pain management can be a major challenge as previous studies demonstrated that it is frequently suboptimal [2,3].

Bariatric surgeries are considered minimally invasive (laparoscopic), but they can cause severe pain [5,6]. Opioids are excellent analgesics, but they have several side effects such as respiratory depression, which may further complicate pain management in weight loss surgeries, particularly in cases with obstructive sleep apnea [7]. Other comorbidities such as diabetes mellitus and cardiovascular diseases that are common in patients with obesity can also lead to difficulties with pain management [8]. This complexity highlights the importance and the challenges of the optimal choice of analgesia in bariatric surgery.

Upper abdominal incisions such as the oblique subcostal laparotomy are a cause of severe pain and can lead to significant respiratory impairment [9].

Enhanced Recovery After Surgery (ERAS) protocols are created to facilitate faster recovery after surgery multimodal analgesia. ERAS programs are multimodal approaches that involve evidence-based, perioperative interventions that maintain physiological function, enhance mobilization, reduce pain, and facilitate early oral nutrition [11].

The complexity of the bariatric patient dictates the choice of safe anesthetic strategies for pain control. One popular approach includes regional anesthetic techniques, which are mainly in neuraxial form (spinal and epidural); or a combination of peripheral nerve blocks, such as transversus abdominis plane (TAP) block, rectus sheath block, thoracic paravertebral block, erector spinae block, local anesthetics administered at the surgical ports or via wound infiltration, and intraperitoneal local anesthetic administration are also possible as a part of multimodal analgesia therapy [21,22].

In our study we performed external oblique intercostal plane block (EOI) and compared it with pre-incisional local infiltration on intra and acute post-operative pain control in adult patients underwent bariatric surgeries and found out that our study group in which (EOI) had better outcomes in terms of opioid consumption, VAS score and hemodynamics.

In agreement with our study Sami Kaan et al., [23] studied the analgesic contribution of external oblique intercostal block on 3 different upper abdominal surgeries in obese patients and compared it with intra operative opioids consumption and they concluded that (EOI) reduced VAS score in the first 12 hours post-operatively.

Hesham El-Sharkawy and his colleagues [17] studied (EOI) in bariatric surgeries on two patients and 22 cadavers in 2021 and found consistent dermatomal sensory block T6-T10 throughout the operations which indicated that (EOI) decreased intra-operative morphine consumption.

Samar Rafik and her colleagues at Banha University in 2022 [24] studied (EOI) vs Transversus Abdominis Plane Block in patients underwent supra umbilical surgical incision and they concluded that (EOI) reduced post-operative pain in the first 24 hours.

Leigh White and his colleagues in 2021 [25] performed (EOI) during surgeries with oblique subcostal laparotomy in obese patients and compared their results with thoracic epidural analgesia and paravertebral blockade, they have found the recently described external oblique intercostal (EOI) plane block to be a simple, effective, and convenient block, particularly in the context of morbid obesity.

Guan-Yu Chen and his colleagues in 2021 [26] studied Transversus Abdominis Plane Block (TAP) versus Wound Infiltration with local anesthetics in adult patients Underwent lower abdominal surgeries and concluded that this neural blockade (TAP) reduced post-operative pain score (VAS) when compared to the conventional infiltration of local anesthetic at the site of surgery, it also reduced post-operative nausea and vomiting (PONV).

Dingeman RS and his colleagues [27] performed Ultrasonography-guided bilateral rectus sheath block vs lidocaine infiltration after umbilical hernia repair in pediatrics and concluded that rectus sheath block reduced FLACC score in PACU in the first 8 hours post-operatively when compared to local wound infiltration alone.

Stopar-Pintaric and his colleagues [28] compared posteromedial quadratus lumborum block versus wound infiltration after caesarean section on 116 female patients and their main findings were that, compared with local anaesthetic wound infiltration, the posteromedial QLB used as a part of multimodal analgesia after caesarean section was associated with lower 24-h opioid consumption and a longer time to the first postoperative opioid PCA demand. Therefore, in the absence of serious side effects and notable complications, posteromedial QLB provided superior analgesia after caesarean section than local anaesthetic wound infiltration.

#### *Conclusion:*

This prospective randomized study was done to compare between the efficacy of External Oblique Intercostal plane block and preincisional local infiltration at minimizing and controlling pain in intra and acute post operative periods in adult patients underwent bariatric surgeries. The results showed that External Oblique Intercostal block Significantly reduced intraoperative heart rate, blood pressure, fentanyl consumption and reduced post-operative pain score (VAS) and morphine consumption in the first 12 hours compared to Preincisional Local infiltration of wound sites. The incidence of complications were reduced in the EOI block group. These results confirm that the use EOI block has a higher

efficacy and value than Preincisional Local infiltration in reducing pain and opioids consumption in intra and acute post-operative periods.

### References

- 1- GAMBOA J.S.B.: Pain management in weight loss surgery: aiming for multimodal approach. *Adv. Obes. Weight Manag Control.*, 5 (2): 00125, 2016.
- 2- FLETCHER D., FERMANIAN C., MARDAYE A., et al.: A patient-based national survey on postoperative pain management in France reveals significant achievements and persistent challenges. *Pain*, 137 (2): 441–51; 42: 133-83, 2008.
- 3- MEISSNER W., HUYGEN F., NEUGEBAUER E.A.M., et al.: Management of acute pain in the postoperative setting: the importance of quality indicators. *Curr. Med. Res. Opin.*, 34 (1): 187-96, 2018.
- 4- SOMMER M., DE RIJKE J.M., VAN KLEEF M., et al.: The prevalence of postoperative pain in a sample of 1490 surgical inpatients. *Eur. J. Anaesthesiol.*, 25 (4): 267-74, 2008.
- 5- HARTWIG M., ALLVIN R., BACKSTROM R., et al.: Factors associated with increased experience of postoperative pain after laparoscopic gastric bypass surgery. *Obes. Surg.*, 27 (7): 1854-8, 2017.
- 6- WEINGARTEN T.N., SPRUNG J., FLORES A., et al.: Opioid requirements after laparoscopic bariatric surgery. *Obes. Surg.*, 21 (9): 1407-12, 2011.
- 7- MASON M., CATES C.J. and SMITH I.: Effects of opioid, hypnotic and sedating medications on sleep-disordered breathing in adults with obstructive sleep apnoea. *Cochrane Database Syst. Rev.*, 7: CD011090, 2015.
- 8- GUPTA K., PRASAD A., NAGAPPA M., et al.: Risk factors for opioid-induced respiratory depression and failure to rescue: A review. *Curr. Opin. Anaesthesiol.*, 31 (1): 110-9, 2018.
- 9- MIMICA Z., POGORELIĆ Z., PERKO Z., SRSEN D., STIPIĆ R. and DUJMOVIĆ D.: Effect of surgical incision on pain and respiratory function after abdominal surgery: a randomized clinical trial. *Hepatogastroenterology*, Dec. 54 (80): 2216-20. PMID: 18265636, 2007.
- 10- ALBRECHT E. and CHIN K.J.: Advances in regional anaesthesia and acute pain management: A narrative review. *Anaesthesia*, Jan. 75 (Suppl 1): e101-e110, 2020.
- 11- THORELL A., MACCORMICK A.D., AWAD S., et al.: Guidelines for perioperative care in bariatric surgery: Enhanced Recovery After Surgery (ERAS) Society recommendations. *World J. Surg.*, 40 (9): 2065-83, 2016.
- 12- M.V., MCMAHON M.L., STUCKE R.S., et al.: Wide variation and excessive dosage of opioid prescriptions for common general surgical procedures. *Ann. Surg.*, 265 (4): 709–14, 2017.
- 13- LESLIE K, MYLES P, DEVEREAUX P., et al.: Neuraxial block, death and serious cardiovascular morbidity in the POISE trial. *Br. J. Anaesth.*, 111 (3): 382-90, 2013.
- 14- LIU L., XIE Y.H., ZHANG W., et al.: Effect of transversus abdominis plane block on postoperative pain after colorectal surgery: A meta-analysis of randomized controlled trials. *Med. Princ Pract.*, 27 (2): 158-65, 2018.
- 15- MA N., DUNCAN J.K., SCARFE A.J., et al.: Clinical safety and effectiveness of transversus abdominis plane (TAP) block in post-operative analgesia: A systematic review and meta-analysis. *J. Anesth.*, 31 (3): 432-52, 2017.
- 16- HAMILTON D.L., MANICKAM B.P., WILSON M.A. and MEGUID E.A.: External oblique fascial plane block. *Reg. Anesth. Pain Med.*, 44: 528-529, 2019.
- 17- ELSHARKAWY H., KOLLI S., SOLIMAN L.M., SEIF J., DRAKE R.L., MARIANO E.R. and EL-BOGHADADLY K.: The External Oblique Intercostal Block: Anatomic Evaluation and Case Series. *Pain Med.*, Nov. 26; 22 (11): 2436-2442. doi: 10.1093/pm/pnab296. PMID: 34626112, 2021.
- 18- JENSEN M.P., KAROLY P. and BRAVER S.: The measurement of clinical pain intensity: A comparison of six methods. *Pain*, 27 (1): 117-126, 1986.
- 19- PICOT J1, JONES J., COLQUITT J.L., GOSPODAREVSKAYA E., LOVEMAN E., BAXTER L. and CLEGG A.J.: The clinical effectiveness and cost-effectiveness of bariatric (weight loss) surgery for obesity: A systematic review and economic evaluation. *Health Technol. Assess.*, 13 (41): 1-190, 2009.
- 20- COLQUITT J.L., PICKETT K., LOVEMAN E., et al.: Surgery for weight loss in adults. *Cochrane Database Syst. Rev.*, 8: CD003641, 2014.
- 21- HUNG W.C., CHEN W.H., SHIH Y.H. and HUNG K.C.: Epidural anesthesia for laparoscopic bariatric surgery: A case report. *Springerplus*, 4 (1): 363, 2015.
- 22- WEINSTEIN E.J., LEVENE J.L., COHEN M.S., ANDREAE D.A., CHAO J.Y., JOHNSON M., HALL C.B. and ANDREAE M.H.: Local anaesthetics and regional anaesthesia versus conventional analgesia for preventing persistent postoperative pain in adults and children. *Cochrane Database of Systematic Reviews*, Issue 6. Art. No.: CD007105, 2018.
- 23- COŞARCAN, SAMI KANAN; ERÇELEN, ÖMÜR: The analgesic contribution of external oblique intercostal block: Case reports of 3 different surgeries and 3 spectacular effects. *Medicine*, 101 (36): e30435, September 09, 2022.
- 24- SAMAR RAFIK MOHAMED AMIN: Benha University. External Oblique Intercostal Plane Block Versus Subcostal Transversus Abdominis Plane Block in Supra-umbilical Surgical Incisions. NIH June 27, NCT05432557, 2022.
- 25- LEIGH WHITE and ANTONY J.I.: *British Journal of Anaesthesia*, May 2022.
- 26- CAI Q., GAO M.L., CHEN G.Y. and PAN L.H.: Transversus abdominis plane block versus wound infiltration with conventional local anesthetics in adult patients underwent surgery: A systematic review and meta-analysis of randomized controlled trials. *BioMed research international*. Mar. 23; 2020, 2020.

27- DINGEMAN R.S., BARUS L.M., CHUNG H.K., CLENDENIN D.J., LEE C.S., TRACY S., JOHNSON V.M., DENNETT K.V., ZURAKOWSKI D. and CHEN C.: Ultrasonography-guided bilateral rectus sheath block vs local anesthetic infiltration after pediatric umbilical hernia repair: A prospective randomized clinical trial. JAMA surgery, 148 (8): 707-13, 2013.

28- STOPAR-PINTARIC T., BLAJIC I., VISIC U., ZNIDER M., PLESNICAR A., VLASSAKOV K. and LUCOVNIK M.: Posteromedial quadratus lumborum block versus wound infiltration after caesarean section: A randomised, double-blind, controlled study. European Journal of Anaesthesiology EJA, 38: S138-44, 2021.

## مقارنة ما بين تخدير العضلة المائلة الخارجية ما بين الضلوع والتخدير الموضعي ما قبل الشق الجراحي فى السيطرة على الألم الحاد خلال وبعد عمليات السمنة فى الأشخاص البالغين

قد يتسبب الألم بعد اجراء العملية الجراحية فى معاناة خطيرة واطالة فترة الافاقة والمصاريف اللازمة للعناية بالصحة، كما أن السيطرة على الألم ما بعد العملية قد يكون تحديا كبير كما وضحت الدراسات السابقة انه كان اقل من الكافى.

عمليات السمنة تعتبر من العمليات الاقل اجتياحية (المنظير)، ولكن قد تتسبب فى ألم شديد. تعتبر المواد الافيونية من المسكنات الجيده ولكن قد تتسبب فى الكثير من الاعراض الجانبية مثل: تثبيط عملية التنفس مما قد يعقد عملية السيطرة على الألم فى عمليات فقدان الوزن خصوصاً فى الحالات التى تعانى من انسداد المجرى الهوائى اثناء النوم.

ايضا الامراض المزمنة كالسكرى وامراض القلب قد تتسبب بصعوبه فى السيطرة على الألم، هذه التركيبية توضح اهمية وصعوبة اختيار الحل الافضل لتسكين الألم بعد عمليات السمنة.

ولذلك، هذه الدراسه قد اجريت للمقارنه ما بين فعالية تخدير العضلة المائلة الخارجية ما بين الضلوع والتخدير الموضعي ما قبل الشق الجراحي فى السيطرة على الألم اثناء العملية الجراحية وفى الفترة الحادة بعد العملية.

وقد أظهرت الدراسة بأن تخدير العضلة المائلة الخارجية ما بين الضلوع قلل بشكل كبير من معدل ضربات القلب أثناء العملية وضغط الدم واستهلاك الفنتانيل وخفض درجة الألم بعد الجراحة (VAS) واستهلاك المورفين فى أول ١٢ ساعة مقارنة بالتخدير الموضعي ما قبل الشق الجراحي وايضاً تقليل حدوث المضاعفات.