Comparison between Ultrasound Guided Transversus Abdominis Plane Block versus Ultrasound Guided IlioInguinal/Iliohypogastric Nerves Block for Postoperative Analgesia in Patients Undergoing Unilateral Oblique Inguinal Hernia Repair Under General Anesthesia

Thesis

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Shrouk Ayman Mohamed Soliman Faramawy

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List of Abbreviations

Abb.	Full term
%	*Percent*
ASA	*American Society of Anesthesiologists*
Cm	*Centimeter*
CNS	*Central Nervous System*
COO	*Ester linkage*
CPR	*Cardio-Pulmonary Resuscitation*
ECG	*Electrocardiogram*
EO	*External Oblique muscle*
Epi	*Epinephrine*
et al.	*And colleagues*
G	*Gauge*
gm	*Gram*
HCL	*Hydrogen Chloride*
Hr	*Heart rate*
Hrs	*Hours*
HS	*Highly Significant*
Ht	*Height*
IH	*Iliohypogastric*
II	*ILioinguinal*
IINB	*Ilioinguinal nerve block*
IV	*Intravenous*
Kg	*Kilogram*
L	*Liter*
L1-5	*Lumbar spinal roots*
LAs	*Local Anesthetics*
LAST	*Local Anesthetic Systemic Toxicity*
MAP	*Mean arterial pressure*
Mcg	*Microgram*

List of Abbreviations cont...

Abb.	Full term
Mg	*Milligram*
Min	*Minute*
Ml	*Milliliter*
MmHg	*Millimeters of Mercury*
N	*Number*
NHCO	*Amide linkage*
NIPH	*Non invasive blood pressure*
NPRS	*Numeric Pain Rating Scale*
NS	*Non Significant*
OR	*Operating Room*
PACU	*Post-Anesthesia Care Unit*
PC	*Peritoneal cavity*
PH	*Measure acidity and basicity of solution*
pKa	*Acid dissociation constant*
S	*Significant*
SD	*Standard Deviation*
SPO2	*Peripheral Oxygen Saturation*
T1-12	*Thoracic spinal roots*
TAB	*Block Transversus abdominis Plane block*
USG	*Ultra-Sound Guided*
VAS	*Visual Analogue Scale*
Vs.	*Versus*
WI	*Wound infilteration*
Wt	*Weight*

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INTRODUCTION

Since the concept of day case surgeries are getting more popular, surgeons and anesthesiologists are trying their best to provide adequate post operative analgesia. The proper management of post operative pain ensures early ambulation of patients and obviates many post operative complications ***(Schug, 2011).***

There are advances in anesthetic techniques, more and more regional blocks are being tried to take care of post operative pain. The choice of anesthetic block technique depends upon the site of surgical incision proposed. Transversus abdominis plane (TAP) block is a novel approach in which local anesthetic agent is injected into the plane between the internal oblique and transversus abdominis muscles ***(Kuppuvelumani et al., 1993).***

The technique of TAP block has been found to be a safe and effective tool in a variety of general, gynecological, and urological surgery, and it is suggested as a part of the multimodal anesthetic approach to enhance recovery after lower abdominal surgeries ***(Johns et al., 2012).***

Transversus abdominis plane (TAP) block is a regional anesthetic technique which blocks neural afferents from the anterolateral abdominal wall. With the aid of ultrasound or anatomical landmark guidance, local anesthetic is injected into

the transversus abdominis fascial plane, where the nerves from T6 to L1 are located. The initial clinical trials assessing the analgesic effect of TAP blockade showed an effect for up to 24 hr postoperatively ***(McDonnell et al., 2007).***

The ilioinguinal-iliohypogastric nerve block provides intraoperative and postoperative analgesia for inguinal surgery. It may be useful for providing analgesia for inguinal hernia repair, orchidopexy, hydrocoele repair, varicocoele surgery. It has also been used, in combination with T11 and T12 intercostal nerve blocks, to provide post-operative pain relief after renal transplant ***(Faiz et al., 2019).***

Both the iliohypogastric (IH) and ilioinguinal (II) nerves arise from L1 and emerge from the upper part of the lateral border of the psoas major muscle. The ilioinguinal nerve is a smaller nerve and courses caudal to the iliohypogastric nerve. Both nerves cross obliquely anterior to the quadratus lumborum and iliacus muscles and perforate the transverse abdominis muscle near the anterior part of the iliac crest. In the anterior abdominal trunk, the nerves travel between the transverse abdominis and the internal oblique muscles ***(Amid et al., 1994).***

Ilioinguinal nerve then pierces the internal oblique muscle, distributing filaments to it, and then accompanies the spermatic cord (in males) or the round ligament (in females) through the superficial inguinal ring. Its fibres are then distributed to the skin of the upper and medial part of the thigh,

skin over the root of penis and upper part of scrotum in males, and to the skin covering the mons pubis and labia majora in females ***(Al-dabbagh, 2002).***

Iliohypogastric nerve divides into lateral and anterior cutaneous branches. The lateral cutaneous branch runs through the internal and external oblique above the iliac crest, a little behind the iliac branch of the T12 spinal nerve, and is distributed to the posterolateral gluteal skin. The anterior cutaneous branch runs between the internal oblique and the transversus abdominis, innervating both muscles. It runs through the internal oblique approximately 2 cm medial to the anterior superior iliac spine and through the external oblique aponeurosis approximately 3 cm above the superficial inguinal ring ***(Eichenberger et al., 2006).***

Because the lateral cutaneous branch of the Iliohypogastric nerve may pierce the internal and external oblique muscles immediately above the iliac crest, it is worthwhile to block the nerves as proximal as possible (i.e., posterior to the anterior superior iliac spine) before the nerve branches ***(Bischoff et al., 2012).***

AIM OF THE WORK

The aim of this study is to test the analgesic efficacy of ultrasound guided TAP block versus ultrasound guided ilioinguinal/iliohypogastric nerves block in patients undergoing unilateral inguinal hernia repair under general anesthesia, as regard hemodynamic stability, start of pain postoperative, time to rescue analgesia and total amount of postoperative narcotics used.

Chapter 1

ANATOMY OF ANTERIOR ABDOMINAL WALL

Layers of anterior abdominal wall

In human anatomy, the layers of the abdominal wall are (from superficial to deep):

1- Skin.

2- Subcutaneous tissue.

3- Fascia.

- Camper's fascia: Thick fatty superficial layer ***(Gray and Henry, 1918).***
- Scarpa's fascia: deep fibrous, membranous layer (stratum membranosum), of the superficial fascia of the abdomen. It is found deep to the Fascia of Camper and superficial to the external oblique muscle ***(Ullah et al., 2013).***

4- Muscles.

- External oblique abdominal muscle.
- Internal oblique abdominal muscle.
- Transverse abdominal muscle.