



بسم الله الرحمن الرحيم

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مسئولية عن محتوى هذه الرسالة.

ملاحظات:

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Evaluation of the Preemptive Analgesic Efficacy of Ultrasound Guided Quadratus Lumborum Block in Nephrectomy

A Thesis

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالَ

سَبَّحَانَكَ لَا إِلَهَ إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْعَظِيمُ

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List of Abbreviations

<i>Abbr.</i>	<i>Full-term</i>
ASA	: American Society of Anesthesiologists
CNS	: Central nervous system
COX-2	: Cyclo-oxygenase-2
CVS	: Cardiovascular system
IL	: Iliocostalis
LA	: Local anesthetics
LD	: Latissimus dorsi
Lo	: Longissimus
Mu	: Multifidus
PM	: Psoas major
PNS	: Peripheral nervous system
PTLF	: Posterior thoracolumbar fascia
QL	: Quadratus lumborum
TLF	: Thoracolumbar fascia

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Introduction

Nephrectomy is a surgical procedure conducted to remove all or part of a kidney. Indications for nephrectomy include simple nephrectomy for the patients with non-neoplastic disease (e.g. trauma, non-functioning kidney with chronic infection and live kidney donation) and radical nephrectomy for those with neoplastic disease. The vast majority (~90%) of solid renal masses are renal cell carcinoma; the remainder comprising mainly of transitional cell carcinoma or Wilm's tumor (in children). Renal cell carcinoma accounts for between 1% and 3% of all visceral malignancies (*Chapman and Pichel, 2016*).

Nephrectomy is a particularly painful procedure especially the open type rather than the laparoscopic type. The subcostal wound is often long (10-12 cm in length) making breathing and coughing extremely painful. Inadequately controlled postoperative pain may have harmful physiologic and psychological consequences which potentially increase the morbidity and mortality. It is also found that 20% of patients reported chronic postsurgical pain (CPSP) 6 months after nephrectomy (*Mathuram et al., 2012*).

There are multiple techniques for postoperative pain management after nephrectomy; Opioids either in form of infusion or patient-controlled analgesia, low thoracic epidural

analgesia, paravertebral block and transversus abdominis plane block (TAPB). Epidural analgesia with catheter technique remains one of the most effective analgesic techniques after nephrectomy. However, it has own problems like urinary retention and risk of infection at the catheter site and its limitations in patients who are either on anticoagulant and have cardiac morbidity (*Chapman and Pichel, 2016*).

Quadratus lumborum block (QLB) is a new abdominal truncal block. It was first described in 2007 by doctor Blanco as a posterior approach to perform TAPB (*Blanco, 2007*).

QLB is an extension of the local anesthetic beyond the TAP spreading into the thoracic paravertebral space with the provision of both visceral and somatosensory blockade of the abdominal wall without the complications of the neuroaxial blocks. Currently ultrasound guided QLB is performed as one of the perioperative pain management procedures with opioid sparing effect as well as rescue analgesia for all generations (pediatric, pregnant and adult) undergoing both abdominal and retroperitoneal surgery (*Ueshima et al., 2017*).

Aim of the Work

The aim of this study is to evaluate the preemptive analgesic efficacy of ultrasound guided lateral quadratus lumborum block during the intraoperative period of nephrectomy regarding opioids sparing effect and at the early postoperative period regarding pain relief, early mobilization and opioids sparing effect.

Anatomy of the Abdominal Wall

The abdominal wall is a layered cylindrical myofascial structure that attaches to the thoracic cage superiorly, the pelvic girdle inferiorly, and the spinal column posteriorly. The boundaries include an anterior, two lateral, and one posterior abdominal wall. The abdominal wall consists of skin, superficial fascia, subcutaneous fat, the muscle layer, the transversalis fascia and a layer of extra-peritoneal fat (*Chin et al., 2017*).

Anatomy of the posterior abdominal wall: (Fig. 1)

The posterior abdominal wall is defined as the area medial to the lateral abdominal walls and ended anteriorly by the posterior part of parietal peritoneum. It acts as a scaffold for the retroperitoneal viscera and neurovascular structures that travel caudally (*Leon and Judith, 2011*).

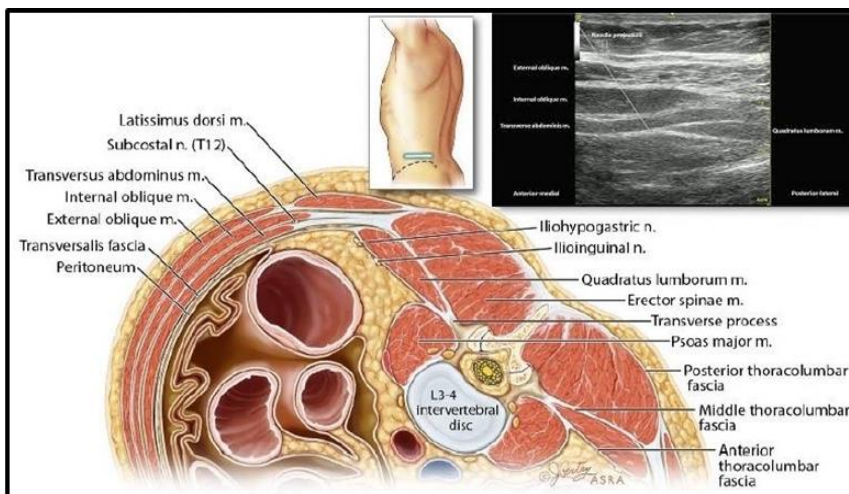


Figure (1): Anatomy of the posterior abdominal wall (*Chin et al., 2017*).

The muscles and fasciae of the posterior abdominal wall:

Quadratus lumborum muscle (Fig.2)

Quadratus lumborum (QL) is a quadrilateral-shaped muscle that originates from the posteromedial iliac crest and inserts into the medial border of the twelfth rib and the transverse processes of the first to fourth lumbar vertebrae. A sheet of thoracolumbar fascia lies both anterior and posterior to QL; thereby wrapping it in a fascial casing. These fascial extensions merge laterally and attach to the transversus abdominis; thereby providing a tensional element of support for the lumbar region. It is supplied by the subcostal nerve and branches of the lumbar plexus. The lateral border of QL is free and usually palpable especially in thin population. Posterior to the QL muscle lies the erector spinae muscle group, consisting of the multifidus, longissimus, and iliocostalis. The QL and the psoas muscles are grouped as deep lateral muscle of the trunk and traverse posterior to the lateral and medial arcuate ligaments of the diaphragm, respectively (*Elsharkawy et al., 2019*).

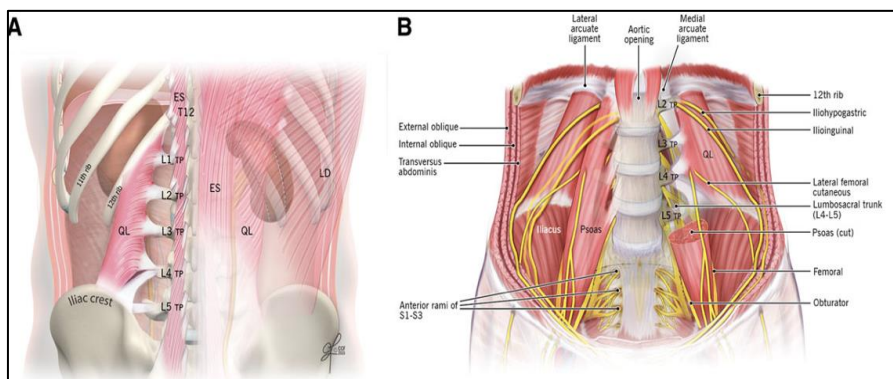


Figure (2): Schematic illustration of the anatomical relations of the quadratus lumborum muscle (*Hesham et al., 2019*)

A: Posterior side; B: Anterior side