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بسم الله الرحمن الرحيم

مركز الشبكات وتكنولوجيا المعلومات

قسم التوثيق الإلكتروني



Safaa Mahmoud



جامعة عين شمس

التوثيق الإلكتروني والميكرو فيلم

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A Comparison between Sub-sartorial Canal Block and Femoral Nerve Block for Postoperative Analgesia after Arthroscopic Knee Surgery

Thesis

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم العليم

صدق الله العظيم

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List of Contents

Title	Page No.
List of Tables.....	i
List of Figures.....	ii
List of Abbreviations	iv
Introduction	1
Aim of the Work.....	3
Review of Literature	
– Anatomy of Nerves of Lower Limb	4
– Pharmacology of Local Anesthetics	12
– Pathophysiology of Pain.....	37
Patients and Methods.....	57
Results.....	66
Discussion	73
Summary.....	77
Conclusion.....	80
References	81
Arabic Summary	

List of Tables

Table No.	Title	Page No.
Table 1:	Classification of opioid receptors	23
Table 2:	Physical characteristics of opioids	28
Table 3:	Uses and doses of common opioids.....	33
Table 4:	Differences between acute and chronic pain	40
Table 5:	Adverse effects of unrelieved pain	52
Table 6:	Metabolic and endocrine responses to injury	53
Table 7:	Comparison between groups as regard demographic data.	66
Table 8:	Comparison between groups as regard numerical rating scale.....	68
Table 9:	Comparison between groups as total dose of nalbuphine consumption: -	70
Table 10:	Comparison between groups as quadriceps weakness:-	71
Table 11:	Comparison between groups as onset of ambulation:-	72

List of Figures

Fig. No.	Title	Page No.
Figure 1:	Lumbar plexus formation.....	4
Figure 2:	Femoral Nerve course	6
Figure 3:	Lateral femoral cutaneous nerve course	7
Figure 4:	Obturator nerve course	8
Figure 5:	Sciatic nerve course	9
Figure 6:	The adductor canal	10
Figure 7:	Local anaesthetic structure.....	12
Figure 8:	Opioid agonists and antagonists share part of their chemical structure, which is outlined in cyan	25
Figure 9:	The four primary types of pain	39
Figure 10:	Different modalities of analgesia.....	41
Figure 11:	Pain transmission from peripheral tissues to the spinal cord	45
Figure 12:	Ascending transmission tracts.....	47
Figure 13:	Gate control theory of pain	50
Figure 14:	Commonly used one-dimensional pain intensity scales	56
Figure 15:	Femoral nerve block technique	61
Figure 16:	Adductor canal block technique	62

List of Figures cont...

Fig. No.	Title	Page No.
Figure 17:	Bar chart between two groups regarding demographic data	67
Figure 18:	Box and whisker between groups as regard numerical rating scale.....	69
Figure 19:	Bar chart between groups as regard total dose of nalbuphine consumption.	70
Figure 20:	Bar chart between groups as regard leg raising test.....	71
Figure 21:	Bar chart between groups as regard onset of ambulation.....	72

List of Abbreviations

Abb.	Full term
ACB	Adductor Canal Block
ACTH	Adrenocorticotrophic hormone
ADH.....	Antidiuretic hormone
ASA	American Society of Anesthesiologists
CNS	Central nervous system
CYP	Cytochrome P
DRG	Dorsal root ganglia
ECF	Extracellular fluid
ECG	Electrocardiogram
EEG	Electroencephalogram
FNB	Femoral nerve block
FNB	Femoral Nerve Block
IASP	International Association for the Study of Pain
ICF.....	Intracellular fluid
IL	Interleukin
LA	Local anaesthetics
NRS	Numeric rating scale
PABA	Para-aminobenzoic acid
PACU	Postanesthetic care unit
PAG	Periaqueductal grey
PCA	Patient-controlled analgesia
PNBs	Peripheral nerve blocks
RVM	Rostroventromedial medulla
SD	Standard deviation
SpO2.....	Pulse oximetry
SPSS	Statistical package for Social Science
TNF	Tumour necrosis factor
TRP	Transient receptor potential
VAS	Visual analog scale
Vd	Volume of distribution
VRS	Verbal categorical rating scale

INTRODUCTION

Knee arthroscopy is a common orthopaedic procedure worldwide, despite its minimally invasive nature compared to the traditional knee surgery, post-arthroscopic pain may be severe, and the patients generally require a significant amount of opioid-based analgesics after such procedures (*Jaeger et al., 2013*).

Several patients experience narcotic-related complications, such as sedation, respiratory depression, nausea, vomiting and constipation following excessive use of opioid analgesics. Peripheral nerve blocks offer effective analgesia and decrease the need for opioids, thereby reducing the complications associated with the use of this class of drug (*Jenstrup et al., 2012*).

Rehabilitation and early mobilization are essential for successful knee arthroscopic surgery. Uncontrolled pain can lead to slowed mobilization and delayed rehabilitation. However, effective postoperative pain control has been correlated with improved patient satisfaction, better short term outcomes, and decreased length of hospital stay. Rehabilitation and early mobilization are essential for successful knee arthroscopic surgery. Uncontrolled pain can lead to slowed mobilization and delayed rehabilitation (*Hanson et al., 2013*).

It has been reported that a significant number of patients have moderate to severe pain 24 hours after ambulatory surgery in general and knee arthroscopy in particular and pain affects the patient's activity level and satisfaction (*Pavlin et al., 2004*).

Effective postoperative pain control has been correlated with improved patient satisfaction, better short term outcomes, and decreased length of hospital stay (*Akkaya et al., 2008*).

Appropriate pain management after knee arthroscopy allows for faster recovery, reduces the risk of postoperative complications, and improves patient satisfaction. Contemporary pain management regimens following knee arthroscopy include oral analgesics, periarticular injection, peripheral nerve blocks (PNBs), and intravenous patient-controlled analgesia (PCA) (*Grosu et al., 2014*).

Femoral nerve block (FNB) is commonly used for analgesia in patients undergoing knee or ankle surgery, it is one of the easiest peripheral nerve blocks to master because the landmarks are generally easy to identify and the nerve is usually found at a superficial depth. However, prolonged motor blockade from FNB is associated with a small but clinically important risk of fall. With the advantage of ultrasonography, the adductor canal can be easily visualized at the mid-thigh level, allowing performance of Adductor Canal Block (ACB) with a high success rate that offers almost pure sensory block with minimal motor involvement as part of a multimodal approach to pain control after knee arthroscopy (*Sørensen et al., 2016*).

However, a limited number of studies have examined the anatomy and infiltration technique of ACB. In addition, studies comparing ACB to FNB in terms of analgesic efficacy and functional recovery remain limited (*Jæger et al., 2013*).

AIM OF THE WORK

The aim of the study is to compare the analgesic efficacy and functional recovery of Adductor Canal Block and Femoral Nerve Block in patients who have undergone knee arthroscopy.

ANATOMY OF NERVES OF LOWER LIMB

The four major nerves innervating the lower limb are the femoral nerve, lateral femoral cutaneous nerve, obturator nerve and the sciatic nerve. These nerves are terminal branches of the lumbosacral plexus (*Collins, 2020*).

Lumbosacral plexus:

It is formed by the anterior rami of L1-L4 nerves. The anterior rami of L4 and L5 combine to form lumbosacral trunk which joins with anterior rami of S1 TO S3 to form sacral plexus. The lumbar plexus lies within the psoas muscle and its branches descend into the proximal thigh (*Bicarb, 2010*).

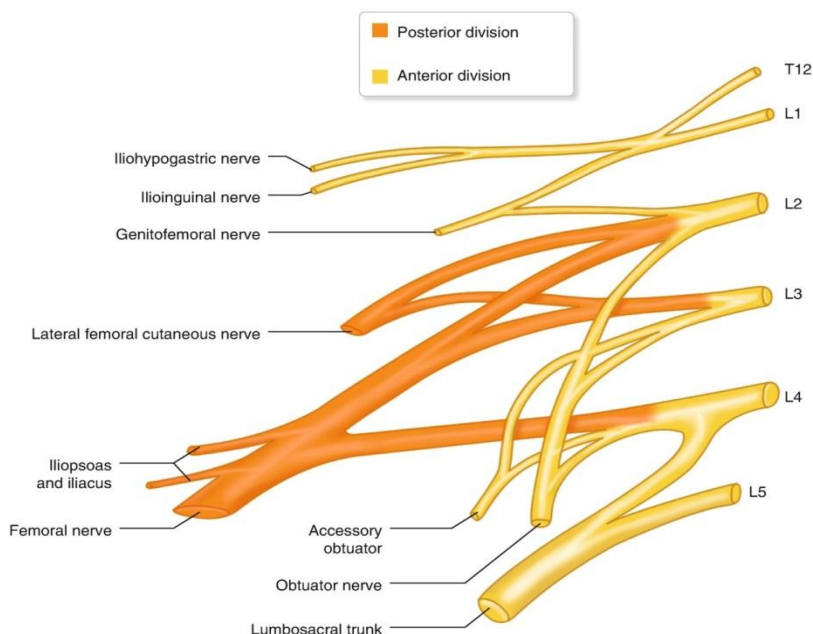


Figure 1: Lumbar plexus formation (*Gilroy, 2006*)

Femoral Nerve:

It carries contributions from the anterior rami of L2-L4 and is the largest branch of the lumbar plexus (**Brown et al., 2009**).

Course:

It descends between the psoas major and iliacus muscle behind the iliac fascia and enters the thigh lateral to the femoral artery under the inguinal ligament. It supplies the iliacus and pectineus muscle in the abdomen. The nerve splits into anterior and posterior divisions in the femoral triangle (**Capdevilla et al., 2008**).

Innervation:

The anterior division gives rise to intermediate femoral cutaneous nerve and medial femoral cutaneous nerve which are sensory nerves. Nerve to Sartorius, a motor nerve is also a branch of the anterior division of femoral nerve.

The posterior division supplies the quadriceps femoris which are the extensors of knee. Saphenous nerve arises from the posterior division and gives sensory supply to anteromedial surface of thigh and medial part of lower leg, ankle and foot (**Sia et al., 2004**).