بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

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Post-Operative Analgesic Effect of Intra-Articular Local Anaesthetic Infiltration versus Adductor Canal Block after Knee Arthroscopic Surgeries

Thesis

Submitted for partial fulfilment of Master degree
in Anesthesiology

By

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List of Abbreviations

Abbr.	Full-term
ACB	**:** Adductor Canal Block
ALM	**:** Adductor longus muscle
AMM	**:** Adductor magnus muscle
CNS	**:** Central nervous system
FA	**:** Femoral artery
FNB	**:** Femoral Nerve Block
G	**:** Gracilis
GCM	**:** Gastrocnemius
GM	**:** Gracilis muscle
IV	**:** Intravenous
NIBP	**:** Non-invasive blood pressure measurement
NPI	**:** Numerical Pain Intensity Scale
NRS	**:** Numeric Rating Scale
NSAIDS	**:** Non-steroidal anti-inflammatory drugs
NVM	**:** Nerve to the vastus medialis
ON	**:** Obturator nerve
P	**:** Patella
PT	**:** Normal prothrombin
PTT	**:** Partial thromboplastin
RFM	**:** Rectus femoris muscle
SD	**:** Standard deviation

SM **:** Sartorius muscle

SN **:** Saphenous nerve

US **:** Ultrasound

VAS **:** Visual Analog Scale

VDS **:** Verbal Descriptor Scale

VM **:** Vastus medialis

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Introduction

Knee arthroscopic surgery is one of the most common orthopaedic procedures, it has replaced earlier open knee procedures, and changed most of knee surgeries from inpatient surgery to outpatient surgery, and drastically cut patient recovery time. [1]

But still a significant number of patients have moderate to severe pain 24 hours after knee arthroscopy and this pain affects the patient's activity level and satisfaction [2].

Postoperative pain after Knee arthroscopy is caused by irritation of free nerve endings of synovial tissue, anterior fat pad, and joint capsule during surgical excision and resection [3].

This pain impulses are transmitted through the following nerve fibres; the nerve to vastus medialis, saphenous nerve, anterior branch of obturator nerve which provides substantial innervation to the medial knee capsule and retinaculum, also branches from sciatic nerve, and the nerve to the vastus lateralis which provide the innervation to other parts of knee capsule [4].

Effective postoperative analgesia for knee arthroscopic surgery, including, opioids and non-opioid medications, local anaesthetic infiltration and peripheral nerve block, has been found to facilitate rehabilitation, improve patient satisfaction, and may reduce length of hospital stay [5].

Intra-articular administration of local anaesthetics has been widely used but some studies have questioned their efficacy. [6] Recently chondrolysis has been reported following use of amide types of local anaesthetic agents in shoulder arthroscopy. [7] However a single dose intraarticular injection of local anaesthetic appears to be safe in the knee and ropivacaine appears to be less toxic than bupivacaine. [8]

With the increasing use of ultrasound (US) for various clinical purposes, now there is an immense increase in the use of peripheral nerve blocks for surgical anaesthesia and post-operative analgesia. [9] Femoral Nerve Block (FNB) is a well–established treatment for post-operative pain in knee arthroscopy but followed by reduced quadriceps muscle strength and associated with high risk of falling. [10]

The Adductor Canal Block (ACB) is a block of the saphenous nerve, which is a branch of the femoral nerve, performed at the level of lower third of the thigh so that the motor innervation of the quadriceps group is spared, the most significant advantage of the ACB over femoral nerve block and other techniques is that it is a pure sensory block provides postoperative analgesia that is at least as good as FNB while preserving quadriceps strength help early ambulation and rehabilitation and reduces the incidence of fall after knee surgeries.[11]

Aim of the Work

Comparing between intra-articular local anaesthetic infiltration and ultrasound guided adductor canal block to achieve effective and safe postoperative analgesia after knee arthroscopic surgeries as regarding duration of postoperative analgesia, need for analgesic supplements postoperatively, patient satisfaction, time of ambulation, and presence of any associated complications or side effects.

Chapter 1
Anatomy

I. Nerve supply to knee:

There are 3 nerves and 3 plexuses around the Knee Joint.

a) **The Saphenous nerve** which is the largest cutaneous branch of Femoral nerve originating from L2,3 roots, it arises from femoral nerve in femoral triangle and descends through it on lateral side of the femoral vessels to enter the adductor canal, it gives infrapatellar and descending branches to the knee [12,13].

Other nerves supplying Knee joint are:

b) **Tibial nerve.**

c) **Common Peroneal nerve.**

both are branches of Sciatic nerve Originating from L4, 5 & S1, 2, 3 roots. Sciatic nerve bifurcates at the apex of the popliteal fossa giving origin to both nerves. They give Articular branches to the Knee joint [12,13].

Also, there are **3 nerve plexuses** Supply the Knee joint:

1) **Peripatellar plexus.**
2) **Subsartorial plexus**.
3) **Popliteal plexus**. [12,13]. (Table 1) (Figure 1)