



شبكة المعلومات الجامعية  
التوثيق الإلكتروني والميكرو فيلم

# بسم الله الرحمن الرحيم



**MONA MAGHRABY**



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التوثيق الإلكتروني والميكروفيلم



# شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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# جامعة عين شمس

## التوثيق الإلكتروني والميكروفيلم

### قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها  
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



### يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



**MONA MAGHRABY**



# **Us Guided vs Landmark Guided in Paramedian Spinal in Elderly**

Thesis

*For Partial Fulfillment of Master Degree  
in Anaesthesia*

By

**Ahmed Ashraf Abdelaziz Bayoumi**

*M.B.B.CH., Faculty of Medicine, Ain Shams University*

Under supervision of

**Prof. Dr. Hala Gomaa Salama**

*Professor of Anesthesia, Intensive Care and Pain Management  
Faculty of Medicine-Ain Shams University*

**Dr. Hanan Mahmoud Farag**

*Assistant Professor of Anesthesia, Intensive Care and Pain Management  
Faculty of Medicine-Ain Shams University*

**Dr. Wael Abdelmoneim Mohamed**

*Lecturer of Anesthesia, Intensive Care and Pain Management  
Faculty of Medicine-Ain Shams University*

*Faculty of Medicine  
Ain Shams University*

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## *List of Abbreviations*

<b>Abb.</b>	<b>Full term</b>
<i>ASRA</i> .....	<i>American Society of Regional Anesthesia and Pain Medicine</i>
<i>CNS</i> .....	<i>Central nervous system</i>
<i>CSF</i> .....	<i>Cerebrospinal fluid</i>
<i>LAST</i> .....	<i>Local anesthetics systemic toxicity</i>
<i>SD</i> .....	<i>Standard deviation</i>

## INTRODUCTION

The ideal technique for spinal anaesthesia requires successful dural puncture with a single needle pass. Multiple puncture attempts are associated with an increased risk of needle trauma, postdural puncture headache, spinal haematoma, backache and paraesthesia (*Chin et al., 2011*). Minimising the number of attempts is desirable to reduce the risk of complications and improve patient satisfaction (*Vogt et al., 2017*).

Spinal anaesthesia has traditionally relied on a technique guided by surface landmarks, something that may be challenging in the elderly because of degenerative changes in the spine (*Srinivasan et al., 2015*). Ultrasonography might improve the efficacy of spinal anaesthesia by improving the accuracy of identification of intervertebral level, depth measurement of the intrathecal space and location of the interlaminar window that permits needle passage. Compared with the landmark guided technique, ultrasound assisted spinal anaesthesia decreases the number of puncture attempts and improves the success rate at the first attempt in patients with potential technical difficulties (*Ekinci et al., 2017*).

However, previous studies that have employed ultrasound assisted anaesthesia in surgical patients in general have reported no significant advantages compared with the landmark guided technique. There is little support for the

routine use of ultrasound for spinal anaesthesia. In particular, it is unclear which groups of patients might benefit from this technique, moreover, previous trials have mainly employed the midline approach, and the ultrasound assisted paramedian approach has not been fully evaluated (*Srinivasan et al., 2015*). As the paramedian sagittal oblique view provided by ultrasound provides a consistently superior view compared to the transverse midline view, offers promise for an ultrasound assisted technique. In a previous trial, the ultrasound assisted paramedian approach required fewer needle passes than the landmark guided technique. However, as the paramedian approach has been shown to facilitate spinal anaesthesia in elderly, it remains to be determined whether the ultrasound assisted paramedian technique is better than the landmark guided or not (*Rabinowitz et al., 2007*).

## **AIM OF THE WORK**

**T**he study aims to evaluate whether ultrasound assisted paramedian spinal anaesthesia in the elderly can achieve successful dural puncture with fewer needle passes compared with the conventional landmark guided paramedian technique.

## *Chapter 1*

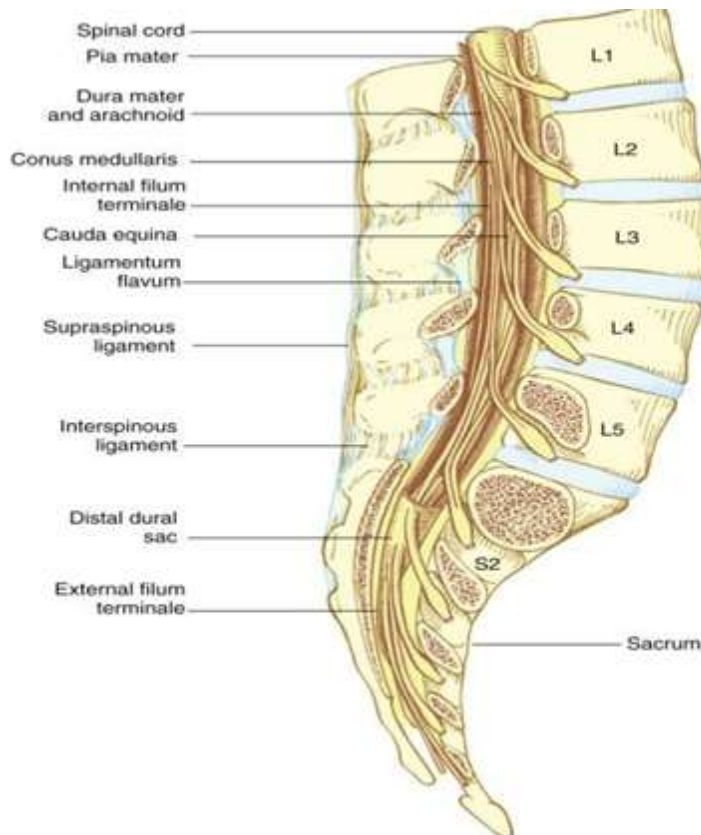
# ANATOMY

### **Anatomy relevant to subarachnoid blockade:**

**T**he spinal canal has a protective sheath composed of three layers. From the outside to the inside they are: dura mater, arachnoid and pia mater (*Figure 1*). These membranes concentrically divide the vertebral canal into three distinct compartments: the epidural, subdural, and subarachnoid spaces (*Snell, 2007*).

The epidural space contains fat, epidural veins, spinal nerve roots, and connective tissue. The subdural space is a potential space between the dura and the arachnoid and contains a serous fluid. The subarachnoid space is traversed by threads of connective tissue extending from the arachnoid mater to the pia mater. It contains the spinal cord, dorsal and ventral nerve roots, and cerebrospinal fluid (CSF). The subarachnoid space ends at the S2 vertebral level (*Reina et al., 1988*).

The nerve root is the main site of action for spinal anesthesia. In spinal anesthesia the concentration of LA in CSF is thought to have minimal effect on the spinal cord itself (*Mulroy, 2002*).



**Figure 1:** Longitudinal section of spinal cord (*Reina et al., 2000*).

## Technique

### Spinal block:

Spinal anesthesia is a type of neuraxial anesthesia; LA is injected into CSF in the lumbar spine to anesthetize nerves that exit the spinal cord. Spinal anesthesia is always performed below L1 in an adult and L3 in a child to avoid needle trauma to the spinal cord. A useful landmark is the line from the top of both iliac crests, which coincides with the L3-L4 interspace.