Upper/Lower Extremity Nerve Blocks
General Overview

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OBJECTIVES

- Describe the four main approaches used for brachial plexus blockade (IS, SC, IC, Axillary)
- Construct the brachial plexus to include, roots, trunks, divisions, cords, and terminal branches
- Describe the various approaches available to provide analgesia to the nerves of the lower extremity
- Appreciate the anatomy of the lumbar plexus and the origination of lower extremity nerves
OVERVIEW
PREVENTATIVE ANALGESIA WITH REGIONAL ANESTHESIA

• Defined: administration of analgesic agents prior to injury

• Reduction in the release of inflammatory mediators thus reducing pain and improving healing

• Secondary benefits of reducing PONV

• Immunomodulatory activities of opioids have been characterized in animal and human studies

• Decreases the occurrence of both peripheral and central sensitization
OVERVIEW PATIENT SELECTION

- Patient preference (lack of knowledge)
- Patient’s coexisting medical conditions (coagulopathies, medications, pre-existing neuropathies or nerve injuries, medical conditions/COPD)
- Surgeon preference
- Skill of provider
- Length of procedure
EQUIPMENT

THE BUTTERFLY IQ ULTRASOUND
APPROACHES TO THE BRACHIAL PLEXUS

- Interscalene
- Supraclavicular
- Infraclavicular
- Axillary
ANATOMY OF BRACHIAL PLEXUS

• Originates from the intervertebral foramina as cervical nerves 5,6,7,8 and first thoracic nerve
• Contributions from C-4 & T-2 are often minor or absent
Note: usual composition shown.
Prefixed plexus has large C4 contribution but lacks T1.
Postfixed plexus lacks C5 but has T2 contribution.
BRACHIAL PLEXUS ANATOMY
INTERSCALENE

Trunks/Superior/Middle/Inferior
BRACHIAL PLEXUS ANATOMY
SUPRACLAVICULAR

Divisions (3 anterior/3 posterior)
BRACHIAL PLEXUS ANATOMY
INFRACLAVICULAR

Cords/Lateral/Posterior/Medial
5 terminal branches/medial/radial/ulnar(axillary/musculocutaneous)
BRACHIAL PLEXUS ANATOMY

- Robert: ROOTS........5
- Taylor: TRUNKS......3
- Drinks: DIVISION....6
- Cold: CORDS........3
- Beer: BRANCHES..5
TERMINAL NERVES
BRACHIAL PLEXUS ANATOMY

- Intercostobrachial nerve and median cutaneous nerves of forearm leave sheath early
- Reside in subcutaneous tissue near axillary block needle insertion site
- Musculocutaneous nerve contained within Coracobrachialis muscle
Figure 2–2. Upper extremity peripheral nerve innervation with arm supinated on arm board.
LOWER EXTREMITY INTRODUCTION

- Regional anesthesia of the lower extremity involves two major nerve plexuses, the lumbar plexus and the sacral plexus.
LOWER EXTREMITY INTRODUCTION

• Lumbar spinal nerves exit caudad to their numbered vertebrae and divide into anterior and posterior rami

• Posterior rami of L1 through L5 supply the muscles and skin of the back

• The lumbar plexus consists of the anterior rami of L1 through L4
LUMBAR PLEXUS INTRODUCTION

- The peripheral branches of the lumbar plexus include the following terminal nerves: iliohypogastric, ilioinguinal, genitofemoral, lateral femoral cutaneous, obturator, and femoral
LUMBAR PLEXUS INTRODUCTION

- The plexus forms within the body of the psoas muscle and the lumbar plexus block (psoas compartment block) consistently blocks the three nerves that supply most of the anterior portion of the lower extremity (femoral, lateral femoral cutaneous, and obturator).
WHAT ARE MY CHOICES

Lower extremity nerve blocks

Lumbar plexus nerve blocks

• Psoas/lumbar plexus
• Fascia Iliaca
• Lateral femoral cutaneous, femoral, obturator
• Adductor canal/saphenous (saphenous at knee)

Sacral plexus nerve blocks

• Sciatic (several approaches)
• Common peroneal/tibial (popiteal approach)
• Ankle nerve blocks (five nerves)
ORIGINATION OF LOWER EXTREMITY NERVES

L 2-3
Lateral femoral Cutaneous

L 2-3-4
Femoral

L 2-3-4
Obturator

L 4-5, S 1-2-3
Sciatic

Common Peroneal

Tibial

Sural

Superficial Peroneal

Deep Peroneal

(Angle Block)
SACRAL PLEXUS

• Sacral plexus is found within the lesser pelvis on the anterior surface of the piriformis muscle.
• Formed from anterior spinal rami of L4 through S4 with most of the nerves leaving through the greater sciatic foramen
• Major nerves are: Superior gluteal nerve (L4-S1), Inferior gluteal nerve (L5-S2), Sciatic nerve (L4-S3), Posterior femoral cutaneous (S2-S3), Pudendal nerve (S2-S4)
• Some individuals sit posturing poorly
ULTRASOUND IMAGE OF FEMORAL NERVE
ULTRASOUND GUIDED POPLITEAL NERVE BLOCK
PLEXUS ANESTHESIA SUMMARY

- Know the anatomy
- Know the landmarks
- Appropriate choice of approach
- Assess the block
- Actions as a result of assessment (supplement)
QUESTIONS?