

# Exploring the Feasibility of Intradural and Extradural Nerve Transfers in the Management of Lumbosacral Plexus Injuries: An Anatomical Cadaveric Study

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## INTRODUCTION:

- Lumbosacral plexus → nerves originating from lumbar and sacral spinal segments
- Key role in lower extremity motor and sensory functions
- Injury to lumbosacral plexus → debilitating pain, weakness, and sensory changes in lower back/limb
- Interventions for lumbosacral plexus injuries have had limited success compared to brachial plexus injuries

## OBJECTIVE:

- Determine the feasibility of a new approach for nerve transfer using intradural and extradural spinal nerve roots
- Determine anatomical or histological differences between the two pieces of the spinal nerve

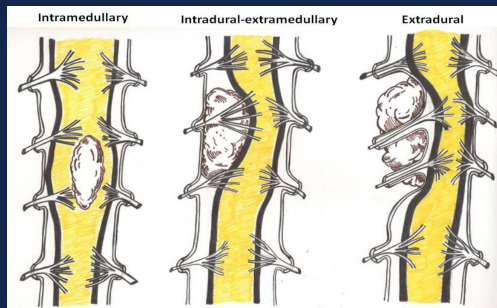


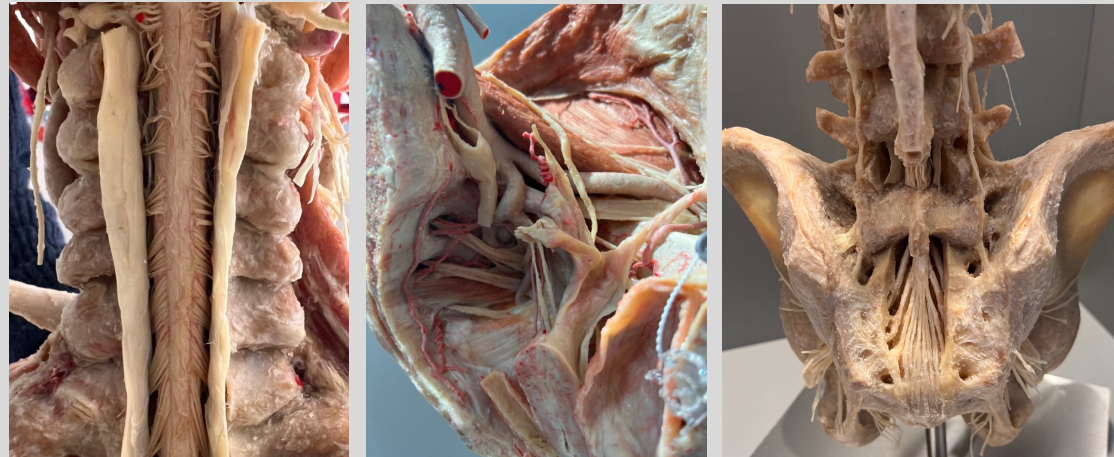
Figure 1. Types of intraspinal tumors. Retrieved from <https://epon.mv.esr.org/poster/esr/acr2013/C-2112/imagina%20findings%20or%20procedure>

## METHODOLOGY:

- Sample size: 10 spinal nerve samples from cadavers
- Cadavers placed in prone position and draped for a spinal cord dissection
- Dissected down to the dura mater
- Segments of spinal nerves of the lumbosacral plexus before and after piercing the dura mater were harvested and placed in formaldehyde
- Nerve samples sectioned into cross sections and hematoxylin and eosin (HE) staining used to observe the histology of the different samples

## RESULTS:

- Micrography analysis → minimal anatomical or histological differences between spinal nerve segments inside and outside of spinal dura mater
- Only difference observed was intradural spinal nerve roots were slightly smaller in diameter compared to extradural spinal nerves



## REFERENCES

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## CONCLUSION AND DISCUSSION:

- Preliminary results disproved our hypothesis
- Challenges encountered in nerve transfers for lumbosacral plexus injuries may not be attributed to structural disparities between these nerve segments
- Future directions → further staining with an AChE stain to determine fiber composition (counting the number of motor vs sensory nerve fibers) to determine functional disparities between the two nerve segments

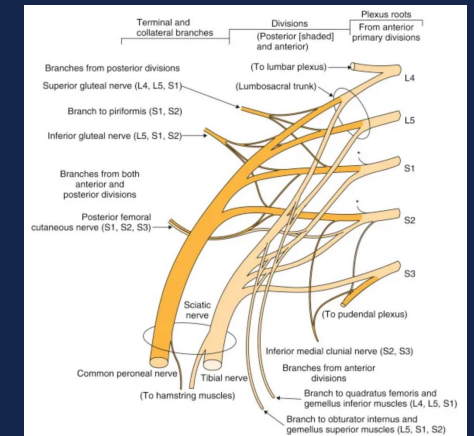


Figure 2. Schematic representation of lumbosacral plexus. Retrieved from <https://musculoskeletalkey.com/lexopathy-lumbosacral/>

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