# Application of Sodium Fluorescein for Spinal Cord Lesions: Intraoperative Localization for Tissue Biopsy and Surgical Resection

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## INTRODUCTION

- Sodium fluorescein (NaFL) has been used to aid in the resection of intracranial lesions
- There is limited research on clinical applications for lesions within the spinal cord
- Fluorescein-guided microsurgery may increase ability to safely treat spinal lesions

## OBJECTIVES

- To describe our first-hand experience using sodium fluorescein for spinal lesions and the surgical advantages obtained

## METHODS

- Twelve patients with spinal cord lesions received fluorescein sodium prior to surgical intervention
- Intraoperative visualization of fluorescence was performed using a Zeiss Pentero microscope equipped with a Yellow560 filter or a Leica OH6 equipped with a FL560 filter.

## RESULTS

- Administration of sodium fluorescein resulted in lesional fluorescent contrast extravasation and facilitated surgical resection and localization in all patients.
- In patients with a goal of complete resection, NaFL aided in complete resection of the spinal lesions in seven patients
- In the other five patients, NaFL allowed for successful tissue biopsy

## CONCLUSIONS

- Fluorescein is a helpful microsurgical tool in guiding surgical resection and in the localization of intramedullary spinal lesions.
- Further research is necessary to explore fluorescein sodium applications in the resection of spinal cord lesions.

**Sodium fluorescein is safe when applied to intradural intramedullary spinal lesions**

**NaFL can be used to increase accuracy when obtaining pathologic biopsies from the spinal cord**

**NaFL can aid in surgical resection of intramedullary spinal lesions and identify important surgical margins**

| Patient | Age (Years) | Sex | Clinical Presentation | Location |
|---|---|---|---|---|
| 1 | 28.8 | F | Progressive neck pain, Upper extremity weakness | C1-C5 |
| 2 | 37.4 | F | Back pain with progressive weakness | L1-L2 |
| 3 | 48.4 | F | Left Upper extremity pain and weakness | T1-T2 |
| 4 | 51.3 | M | Progressive weakness | Multiple lesions |
| 5 | 54.2 | F | Progressive lower extremity weakness | T12-L1 |
| 6 | 67.3 | M | Progressive myelopathy | C7-T1 |
| 7 | 58.0 | M | Progressive weakness | C2-C3 |
| 8 | 41.8 | F | Progressive lower extremity weakness | T1-T2 |
| 9 | 47.6 | M | Right Upper extremity pain | C3-C5 |
| 10 | 47.4 | M | Radicular chest pain | T2-T4 |
| 11 | 65.5 | M | Progressive left lower extremity numbness | T7-T8 |
| 12 | 81.8 | M | Progressive cervical myelopathy | C1-C5 |

| Patient | Age (Years) | Sex | Surgical Goal | Fluorescein Staining | Final Diagnosis |
|---|---|---|---|---|---|
| 1 | 28.8 | F | Resection | FL + | WHO II Ependymoma |
| 2 | 37.4 | F | Resection | FL + | WHO I Myxopapillary Ependymoma |
| 3 | 48.4 | F | Resection | FL + | Nerve Sheath Tumor |
| 4 | 51.3 | M | Biopsy | FL + | Bacterial abscess |
| 5 | 54.2 | F | Biopsy | FL + | EBV Lymphoproliferative Disease |
| 6 | 67.3 | M | Biopsy | FL + | Glial cells with proliferation and lymphocytic cuffing |
| 7 | 58.0 | M | Biopsy | FL + | Anaplastic Astrocytoma, IDH-wildtype, WHO grade III |
| 8 | 41.8 | F | Biopsy | FL + | Anaplastic Astrocytoma, H3-K27M mutant |
| 9 | 47.6 | M | Resection | FL + | WHO II Ependymoma |
| 10 | 47.4 | M | Resection | FL + | WHO II Ependymoma |
| 11 | 65.5 | M | Resection | FL+ | WHO II Ependymoma |
| 12 | 81.8 | M | Resection | FL+ | WHO II Ependymoma |