

## Initial Experience with Intraoperative Phosphorous-32 Brachytherapy During Resection of Malignant Spinal Tumors

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### Introduction

Brachytherapy is an adjuvant therapies for neoplastic processes, but few have trialed its use for spinal tumors. This study examines the perioperative and long-term outcomes of malignant spinal tumor patients who underwent resection and intraoperative phosphorous-32 (P32) brachytherapy.

### Methods

A consecutive series of adult patients who underwent intraoperative P32 brachytherapy during malignant spinal tumor resection were retrospectively identified from 2014 to 2015. Complications, perioperative outcomes, tumor recurrence, and survival were reviewed.

### Results

A total of 8 patients were included. Average age was 54.3 years and 25.0% males. Tumor types included: leiomyosarcoma, chordoma, multifocal recurrent ependymomas, breast metastasis, malignant meningioma, and myxofibrosarcoma. Half (50.0%) underwent en bloc tumor resection. P32 plaques were applied to 2 sites per patient for a mean of 13.1 minutes with goal penetration of 10 Gy to 1 mm depth. Length of hospital stay was 7.1 days. Perioperative complications occurred in 3 of 8 patients (37.5%), including wound healing issues in 1 patient who had a persistent cerebral spinal fluid leak following intradural resection of a malignant meningioma and 1 patient with an infection (12.5%). Ninety-day readmission was 25.0%. Mean length of follow-up was 25.6 months. At most recent follow-up, local recurrence rate was 25.0%, and overall survival was 75.0%. Mean time to recurrence was 14.4 months. Progression free survival (PFS) at 6-, 12-, 18-, and 24-months 100.0%, 87.5%, 75.0%, and 71.4%, respectively. Survival at 6-, 12-, 18-, and 24-months was 100.0%, 100.0%, 85.7%, and 71.4%, respectively.

### Conclusions

P32 is safe, practical, and feasible. P32 intraoperative brachytherapy does not increase the risk of wound healing issues or infections compared to external beam radiation. The sample size of this series is small and there is heterogeneity in tumor type, but recurrence and survival outcomes seem promising compared to prior reports. Appropriately empowered clinical trials are needed.

### Learning Objectives

By the conclusion of this session, participants should be able to:

1. Understand the indications of intraoperative P32 plaque treatment.
2. Describe the advantages of using P32 plaques as an adjuvant for additional tumor control.
3. Recognize the trends in progression free survival and overall survival

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