

Collagen-Embedded Cesium-131 After Metastasis Resection: Local Control in Newly Diagnosed Brain Lesions

Mazen Taman, PharmD; Carlin Chuck, MD; Trenton Kite, BS; Alice Lin, BS; Sumaiya Sayeed, MD; Natalie Amaral-Nieves, MD; Elaina Wang, MD; Joseph Oldam, BS; Abigail A. Teshome, A.B.; Hsien-Chung Chen, MD; Rohil Shekher, MD; Sabrina Zeller, MD; Heinrich Elinzano, MD; Sasmit Sarangi, MD; Eric T. Wong, MD; Mark Rivard, PhD; Clara Ferreira, MD; Simon Hanft, MD; Clark C. Chen, MD, PhD

INTRODUCTION

There are compelling rationales for considering brachytherapy, such as Gammatile (GT), at the time of brain metastasis (BM) resection, including superior radiation dosimetry, timely radiation delivery, and minimizing the burden of repeated hospital visits. While such practice is documented in recurrent BM, there is limited information on its use for newly diagnosed BM (nBM). Here, we report the outcome of 36 nBM patients who underwent resection/GT implant.

METHODOLOGY

Clinical information was collected for consecutive n BM patients treated at the University of Minnesota, Westchester Medical Center, and Brown University. Actuarial local control and overall survival (mOS) were calculated from the time of GT implant.

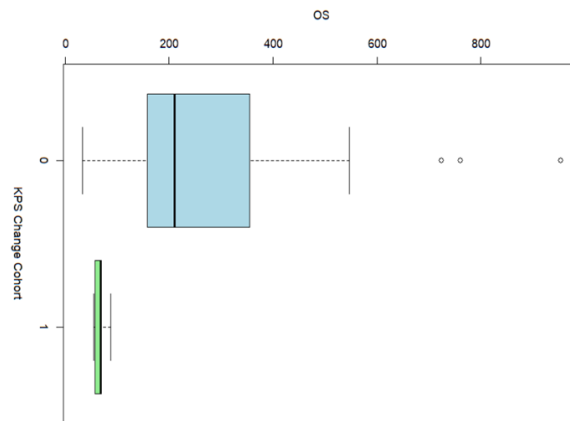


Figure 1. Overall Survival by KPS Change:

Boxplot comparing OS in patients with stable/improved vs. declined post-operative KPS. Decline was associated with shorter OS ($p = 0.02$)

Table One: Surgical Characteristics	Total (N=36)
Gross Total or Subtotal Resection	
- GTR	35 (97.2%)
- STR	1 (2.8%)
Preoperative KPS, median [IQR]	80, [70, 90]
Postoperative KPS, median [IQR]	85, [70, 90]
KPS change from Surgery median [IQR]	0, [0, 2.5]
3-month KPS (among survivors) median [IQR]	70, [55, 90]
30-day readmission	9 (25%)
Followup Duration, mean (SD), days	328 (320)
Radiation necrosis, n (%)	1, (2.8%)
Overall Survival, median [IQR]	182, [83, 285]
Survival at Followup, n (%)	12, (33%)

Table 1. Surgical Characteristics:

Operative variables including tumor size, extent of resection, number of GammaTiles used, and peri-operative outcomes. Values shown as mean $\pm$ SD or median (range).

OS Kaplan-Meier Curves

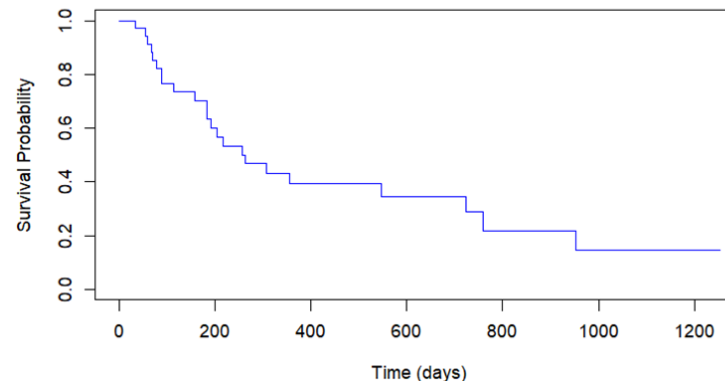


Figure 2. Kaplan-Meier Curve of Overall Survival:

Survival curve for the cohort ($n = 36$) after resection and GammaTile implantation. Median OS = 182 days; 1-year local control = 91.7%.

RESULTS

Results: The cohort comprised 14 men and 22 women (mean age: 62.1 ± 8.9 years). The histology included: 19 lung, 6 melanoma, 5 breast, 3 gastrointestinal, and 1 valvular cancer. The mean diameter of the resected BM was 3.28 ± 1.35 cm. Gross total resection was achieved in all but one subject. The number of GT used ranged 4-12 (median of 6). The average Karnofsky Performance Score (KPS) before resection/GT implant was 81 ± 11.1 ; There were no peri-operative complications, with the average hospital stay of 2.2 ± 1.6 days. There were nine 30-day readmissions (25%). KPS improved/remained stable for 29 patients and worsened in 7. With the median follow-up of 328 days, the actuarial local control at one year was 91.7%. The median overall survival (OS) of the cohort was 182 days. Pre-operative KPS did not associate with OS (77 vs. 199 days, $p=0.232$). However, patients whose KPS declined after the resection showed shorter OS (65 vs. 211 days, $p=0.02$).

CONCLUSION

This series is the largest to date documenting GT for newly diagnosed BM, with a highly favorable safety and efficacy. KPS decline post-resection is associated with poor survival, emphasizing the importance of a “safe” resection.



UNIVERSITY OF MINNESOTA

