

Comparative Risk Analysis of Surgical Strategies for Patients with Multiple Intracranial Metastases

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Introduction

The value of resecting multiple intracranial metastatic tumors, particularly when they are in noncontiguous anatomical regions, remains unclear. In analyzing a homogeneous population of patients with multiple CNS metastases, we sought to compare the clinical impact of resecting: (1) only the largest metastatic tumor (2) multiple tumors through multiple craniotomies during a single operation (3) multiple tumors in separate operative stages.

Methods

We identified 135 patients with multiple intracranial metastases who underwent 158 microsurgical resections of their tumors. Perioperative, clinical and radiographic data were retrospectively collected.

Group 1: Single tumor resected (81%)

Group 2: At least two tumors removed at staged surgeries within 30 days (11.1%)

Group 3: At least two tumors removed from 2 different locations at the same surgery (8.1%)

Results

Group Diversity

	Group 1	Group 2	Group 3
Female	51.1%	25%	46.7%
Male	48.9%	75%	53.3

Tumor Diversity

	Group 1	Group 2	Group 3
Lung	66%	50%	46.7%
Breast	14.5%	12.5%	20.0%
Melanoma	10.5%	25%	6.7%
Colon	4.0%	0%	0%
Prostate	1.3%	0%	0%
Uterine	0%	12.5%	6.7%
Ovary	1.3%	0%	0
Esophagus	0%	0%	6.7%
Carcinoid	0%	0%	6.7%

Outcomes

	Pre-Operative	Immediate Post-Operative	6 Weeks Post-Operative
Group 1	77	70	75.1
Group 2	73.8	61.4	75.7
Group 3	77.1	70.7	76.2

No statistical significance between the groups

Conclusions

A majority of metastatic brain tumor patients present with multiple tumors. Although the value of resecting a single metastasis for diagnosis and decompression is well-established, the safety and efficacy of resecting multiple tumors in anatomically-disparate regions remains unclear. Our findings suggest that multiple metastatic tumors can be resected safely, even when multiple craniotomies are necessary. Furthermore, staging these craniotomies appears to provide no added safety in comparison to performing multiple craniotomies during the course of a single operation.

Learning Objectives

By the conclusion of this session participants should be able to: 1) Describe the importance of treating metastatic lesions, 2) Discuss in small groups the roles of multiple craniotomies for treatment of metastatic lesions, 3) Identify that staged and unstaged procedures provide equivalent results.

References

1. Grossman et al., Predictors of Inpatient Death and Complications among Postoperative Elderly Patients with Metastatic Brain Tumors, *Annals of Surgical Oncology*, (2011)18(2) 521-528.
2. Zhang et al., A Review of Current Management of Brain Metastases, *Annals of Surgical Oncology* (2012)19(3):1043-1050.
3. Grossman et al., Outcome of Elderly Patients Undergoing Awake-Craniotomy for Tumor Resection, *Annals of Surgical Oncology* (2013) 20(5) 1722-1728