



# Craniotomy for Tumor Resection in Patients with Multiple Brain Metastases: Characteristic of the Dominant Metastatic Lesion

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## Introduction

In the surgical management of multiple brain metastases, resection of the dominant lesion occurs in the setting of neurological compromise. There is a paucity of data characterizing the dominant lesion. This study aims to quantitatively and qualitatively describe a “dominant” metastatic lesion and assess symptomatic improvement following resection.

## Methods

All adult patients with multiple brain metastases (2 or more) from 2007 to 2013 who underwent craniotomy for tumor resection for were identified. Outcomes of interest were perioperative complications and change/resolution of symptomology at discharge. Characteristics associated with symptom resolution were assessed via chi-squared test.

## Results

A total of 38 patients were included in the study. 36.8% were male and mean age was 59.0 years. Of the 38 dominant tumors resected, 94.7% enhanced, 50.0% were hemorrhagic, and 28.9% had cystic components. The mean largest diameter of the dominant lesion was 39.5 mm and mean volume was 202873.2 mm3. The next largest lesion had a mean diameter of 13.2 mm (range 3 mm to 31 mm) and volume of 11496.9 mm3. The dominant metastatic lesion proved to be at least 299.2% larger in mean largest linear dimension and 1764.6%% larger by volume compared to the next largest metastatic lesion. 65.9% of patients achieved gross total resection and 68.4% of patients had at least partial resolution of symptoms. Resection of the dominant lesions with greater than 3 times the diameter or greater than 15 times the volume than the next largest lesion had significantly higher rates of symptom relief compared to smaller dominant lesions (80.0% vs. 46.2%, p=0.033). In patients with cerebellar lesions, symptom improvement occurred 100.0% of the time.

## Conclusions

Craniotomy for resection of dominant metastatic tumors is effective for symptomatic relief, especially for dominant lesions 3 times the diameter or 15 times the volume of the next largest lesion.

## Learning Objectives

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

1. Describe how much larger the 2nd lesion is compared to the dominant lesion.
2. Understand which patient will gain the most symptomatic benefit.

## References

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2. Hazuka MB, Burleson WD, Stroud DN, Leonard CE, Lillehei KO, Kinzie JJ. Multiple brain metastases are associated with poor survival in patients treated with surgery and radiotherapy. Clin Oncol. 1993 Feb;11(2):369-73.