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### Tracking Growth of Brain Metastases (Poster)

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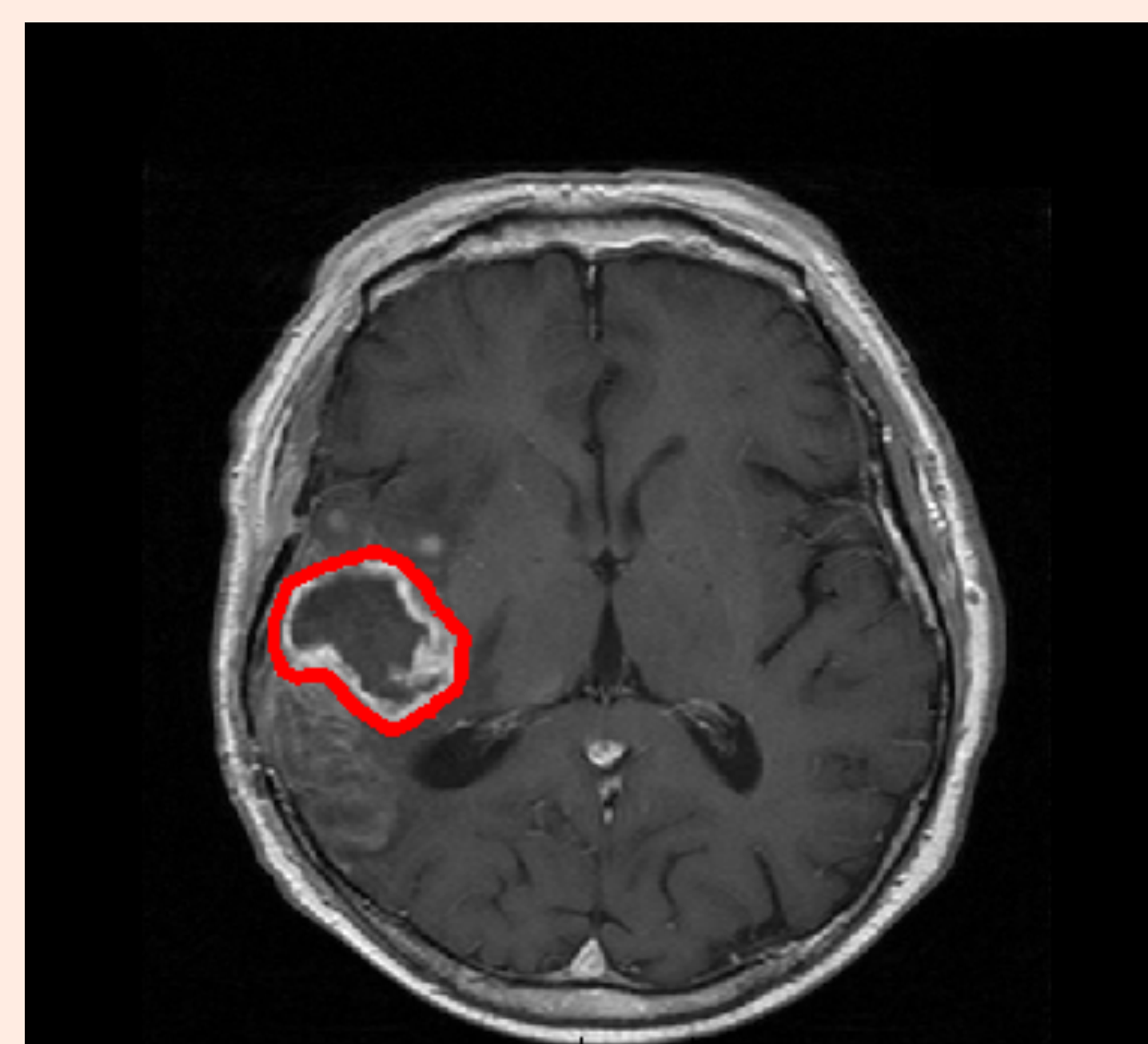
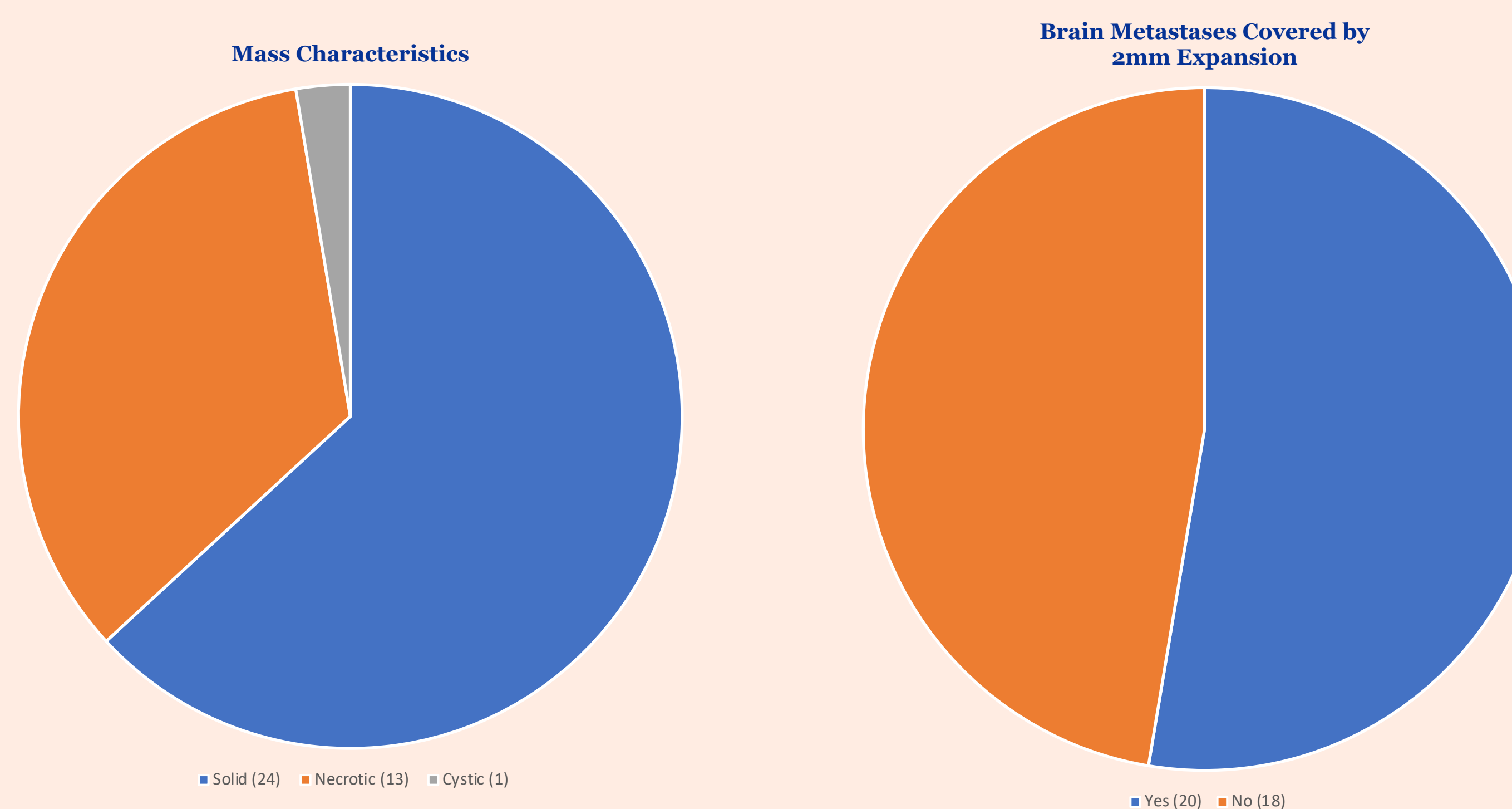
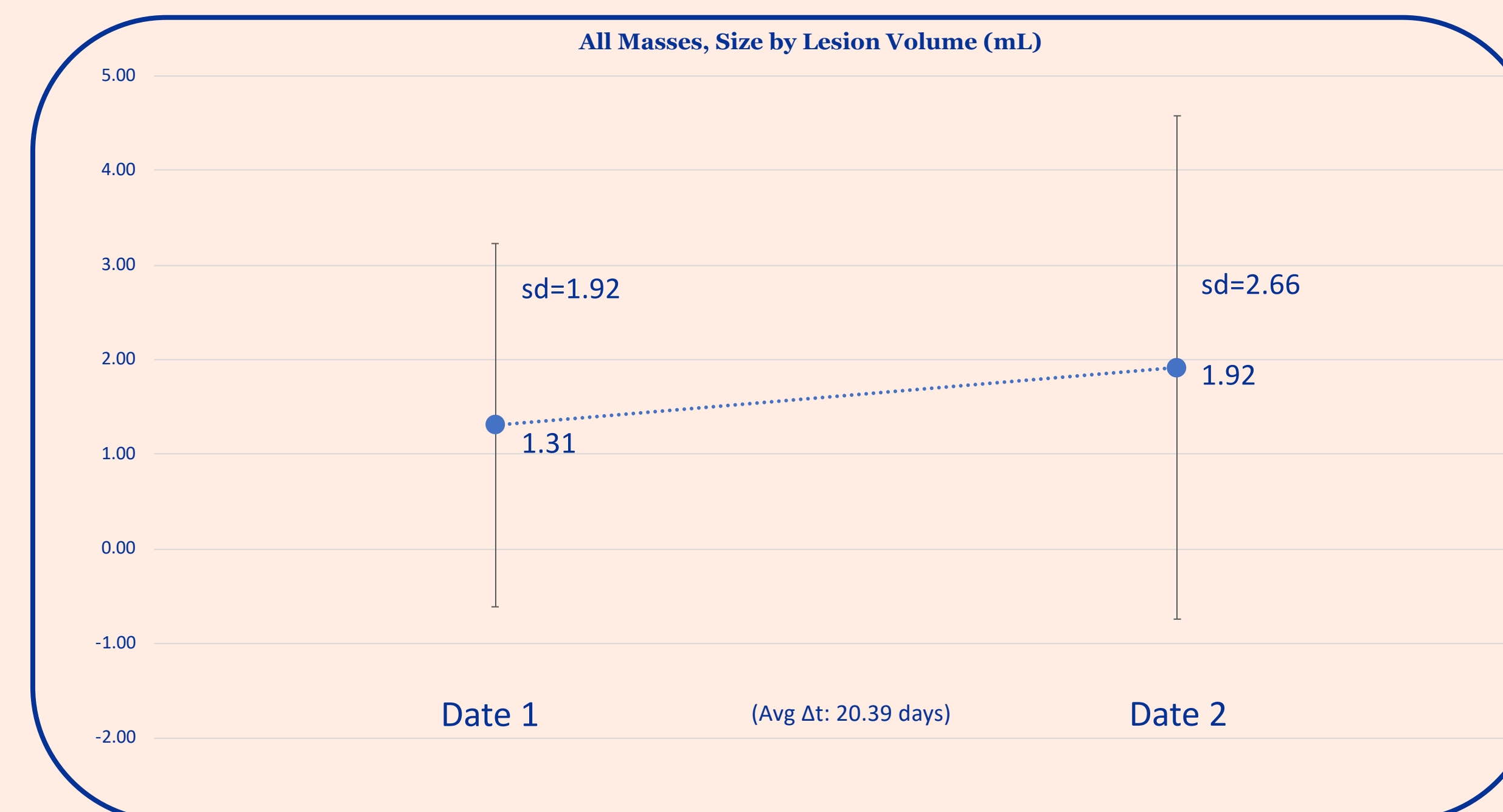
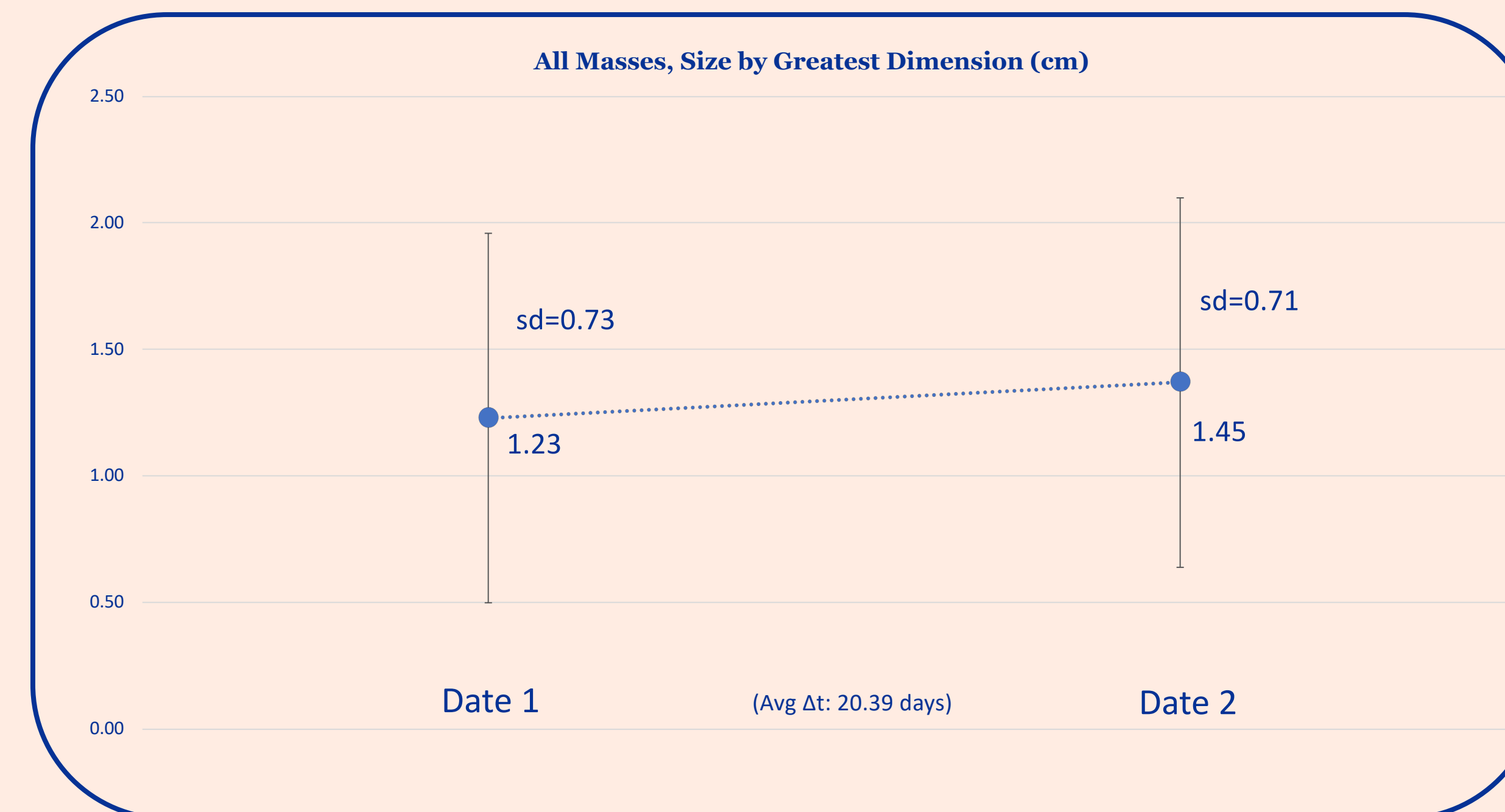
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## Introduction

- Brain metastases are a common complication of cancer and are thought to occur in up to one-fourth of all cancer patients
- While abundant research has been done on the different treatment modalities for brain metastases, literature is relatively sparse on their growth rate
- The time delay between imaging and delivery of treatment may result in clinically significant tumor growth that could alter treatment planning
- In Cyberknife therapy, treatment planning may be based on imaging obtained >1 week before treatment administration, in contrast to Gamma Knife therapy, where a pretreatment MRI is always obtained within hours of treatment
- There are no current recommendations for imaging to treatment delay as of this time
- Understanding of growth rate in brain metastases can increase the confidence of radiation oncologists on the effects of delay in treatment and help determine the value of radiation therapy for poor performance patients
- The goal of our study is to determine a general growth rate for brain metastases to address the uncertainties of delay of treatment and determine the value of radiation therapy in poor performance patients
- We hypothesize that the masses will not outgrow a 2-mm expansion of margins from initial diagnostic MRI to pre-treatment (Gamma-knife) MRI



<http://spokanecyberknife.com/wp-content/uploads/2013/09/brain1.png>

[https://webdocs.cs.ualberta.ca/~btap/images/T1C\\_GBM\\_axial\\_2\\_wOutline.png](https://webdocs.cs.ualberta.ca/~btap/images/T1C_GBM_axial_2_wOutline.png)

## Methods

- This qualitative study includes 21 patients treated with Gamma Knife therapy at MD Anderson of Cooper University Hospital
- These 21 patients had various amounts of brain metastases, totaling 38 metastases
- All patients had never received stereotactic radiosurgery (SRS) in the past or during the timeframe between imaging to treatment
- No patients were receiving chemotherapy during this timeframe
- All patients had 2 MRI imaging sets at separate dates, a diagnostic MRI and a pretreatment MRI
- Imaging sets were retrospectively reviewed to measure volume, size of greatest dimension, and type of lesions using Pinnacle software

## Results

- Our collected data is over a mean time span of 20.39 ± 16.54 days
- The mean volume of brain metastases grew from 1.31 ± 1.92 mL to 1.92 ± 2.66 mL The average growth rate of all masses by volume was 0.03mL/day ± 0.06
- During this same time frame, the mean size of greatest dimension grew from 1.23 ± 0.73 cm to 1.45 ± 0.71 cm. The average growth rate of all masses by size of greatest dimension was 0.12mm/day ± 0.23
- 20 of the 38 masses would be covered by a 2mm expansion of margins surrounding the brain metastases

## Conclusion

- Our results show 52.63% of masses were covered by a 2mm expansion of margins at an average of 20.39 days. This emphasizes the importance of minimizing delays in treatment from diagnosis
- A larger sample size of brain metastases would give us growth rates more specific to the source of cancer and provide greater clinical utility
- More research should be done on this subject to help predict growth rates of certain cancers and determine the value of radiation therapy in poor performance patients