

# Solitary brain metastasis from prostate cancer: a case report

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## Introduction

- Brain metastases arising from prostate cancer are exceedingly rare and typically occur late in the course of the disease.
- Most patients have widespread metastatic disease before developing brain metastases from prostate cancer.
- It is even more uncommon to have the brain as the sole site of metastatic prostate cancer.
- Our review of the literature identified only 16 previously-reported cases over the past 25 years.
- Objective:** We report the case of a 67-year-old male who presented with a recurrence of prostate cancer with an isolated symptomatic brain metastasis (Figure 1).

## Case presentation

### Patient History

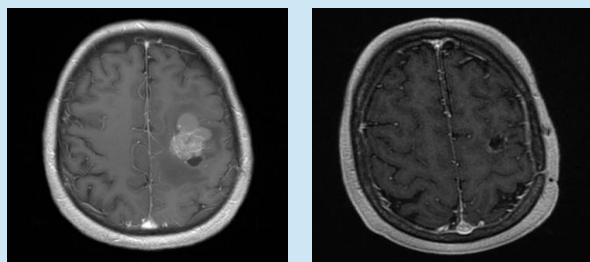
- A 67-year-old male was diagnosed with prostate cancer in 2008, presenting with a prostate specific antigen (PSA) of 53.13 ng/dL, and a Gleason 8 (4+4), T3a prostate cancer.
- Staging with CT scans and bone scan did not show any evidence of systemic disease.
- The patient received radiation treatment (RT) to his pelvic lymph nodes and prostate after which his PSA fell to 2.26 ng/dL.
- Androgen deprivation therapy (ADT) was subsequently initiated for three years and terminated in 2012. Approximately one year after initiation of ADT, his PSA was undetectable.

### Recurrence

- The patient showed no sign of recurrence until 2014 when he presented with symptoms of dizziness, mild dysphagia and imbalance.
- Following a suspicious fall in his urologist's office, an MRI of his brain showed a heterogeneous, multi-lobulated intra-axial lesion in the left frontal lobe with rim enhancement and surrounding edema (Figure 1). Repeat staging which showed no evidence of extra-cranial disease.
- His PSA two years following termination of ADT rose from an undetectable <0.2 to 3.7.

### Treatment

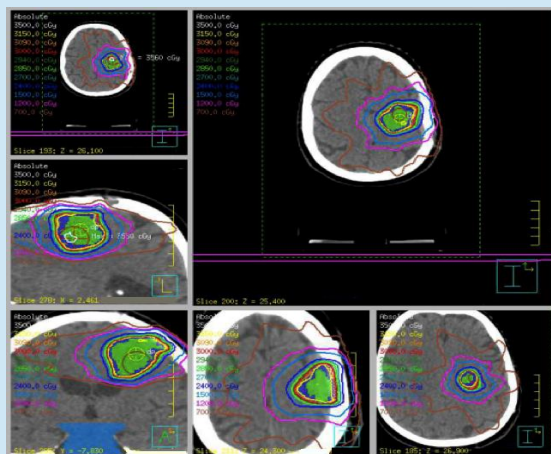
- A left temporal craniotomy and gross total resection of the tumor was performed.
- The final pathologic diagnosis confirmed prostate cancer, staining positive for PSA.
- The patient experienced a complication-free postoperative recovery with no neurological deficits.



**Figure 1 (Left - Prior to treatment):** T1-weighted post-gadolinium contrast MRI revealing heterogeneous, multi-lobulated intra-axial lesion in the left frontal lobe, with rim enhancement and surrounding edema.

**Figure 2 (Right - Post-treatment):** T1-weighted post-gadolinium contrast MRI showing no evidence of residual or recurrent disease.

- Tumor resection was followed by stereotactic radiation therapy to the surgical cavity with a dose of 30Gy in 5 fractions (Figure 3).
- ADT was subsequently re-initiated, resulting in the patient's PSA returning to an undetectable level and remaining undetectable with no evidence of disease 17 months post-radiotherapy. MRI imaging confirmed no evidence of residual or recurrent disease (Figure 2).



**Figure 3:** Fractionated stereotactic radiosurgery treatment plan, delivering 30Gy in 5 fractions.

## Discussion

- For decades, surgical resection with adjuvant WBRT has been the standard of care for solitary metastases in the brain. This combined therapy strategy has been found to significantly reduce the risk of recurrence when compared with surgical resection or WBRT alone (14-17). These studies, however, did not include any patients with prostate cancer brain metastases patients.
- Due to concerns of WBRT-related neurotoxicity and the risk of neurocognitive side effects, the application of high dose radiation to the postoperative surgical bed through stereotactic radiosurgery has been increasing in clinical practice (18). Stereotactic radiosurgery alone following surgical resection of a brain metastasis has the potential to limit long-term neurocognitive side effects and improve local control as compared to WBRT (19,20).
- The risk of distant brain recurrence in patients with brain metastases from prostate cancer is unknown. The potential for WBRT to decrease distant brain recurrence as compared to cavity stereotactic radiosurgery is, therefore, also unknown.
- In this case, given that there was only one site of disease, it was felt to be reasonable to forego WBRT and monitor with brain imaging on a three-month basis. The approach has appeared effective thus far, with no evidence of new or recurrent disease in the brain at the time of report.

## Conclusions

This unique case of a 67-year-old male with a solitary brain metastasis arising from prostate cancer demonstrates that aggressive treatment with tumor resection and adjuvant stereotactic RT to the surgical bed without WBRT may be optimal in the management of such patients.

## References

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