Outcomes of CyberKnife Stereotactic Radiotherapy for Intracranial Metastatic Renal Cell Carcinoma

Anand Veeravagu MD; Michael Zhang BA; Tej Deepak Azad BA; Steven D. Chang MD

CNS 2015 ANNUAL MEETING NEW ORLEANS LOUISIANA SEPTEMBER 26-30, 2015

Introduction

Survival following brain metastases from renal cell carcinoma (RCC) is extremely poor, with median survival after SRS reported to be between 6-11 months. Corticosteroid therapy, radiotherapy, and resection have been the mainstays of treatment. In this study the authors examined the efficacy of CyberKnife stereotactic radiosurgery (SRS) in treating RCC metastases to the brain and evaluated factors affecting long-term survival.

Methods

The authors conducted a retrospective review of 174 patients (123 male) undergoing SRS for a total of 225 RCC metastases. Clinical and radiographic data were collected from three institutions. Multivariate analyses were used to determine significant prognostic factors influencing survival.

Results

The overall median length of survival was 9 months (range 0-51 months) from date of SRS. In a multivariate analysis, we found that prior surgical resection ($p = 0.0266$, Hazard ratio = 0.419) influenced survival and discovered a trend toward poor outcomes in the presence of lung metastases ($p= 0.0886$, Hazard ratio = 2.162). Postradiosurgical imaging of the brain demonstrated radiographic stability in 80% of patients and follow up revealed clinical stability in 81% of the cohort.

Conclusions

Stereotactic radiosurgery for treatment of RCC metastases to the brain provides effective local tumor control in approximately 96% of patients and a median length of survival of 9 months after SRS. Early detection of brain metastases, aggressive treatment of systemic disease, and a therapeutic strategy including radiosurgery can offer patients an extended survival.

Learning Objectives

-Understand how CyberKnife radiosurgery outcomes for intracranial RCC compare to other those SRS modalities

-Identify variables that may predict for increased survival when considering SRS treatment

-Consider the role of CyberKnife SRS in the developing treatment algorithm for intracranial RCC

References

1. Kano H, Iyer A, Kondziolka D, Niranjan A, Flickinger JC, Lunsford LD. Outcome predictors of gamma knife radiosurgery for renal cell carcinoma metastases. Neurosurgery. 2011 Dec;69(6):1232-9.

2. Kothari G, Foroudi F, Gill S, Corcoran NM, Siva S. Outcomes of stereotactic radiotherapy for cranial and extracranial metastatic renal cell carcinoma: a systematic review. Acta Oncol. 2015 Feb;54(2):148-57

3. Sheehan JP, Sun MH, Kondziolka D, Flickinger J, Lunsford LD. Radiosurgery in patients with renal cell carcinoma metastasis to the brain: long-term outcomes and prognostic factors influencing survival and local tumor control. J Neurosurg. 2003 Feb;98(2):342-9.