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Abstract

Object Gamma Knife surgery (GKS) has been reported as an effective modality for treating brain metastases from renal cell carcinoma (RCC). The authors aimed to determine if targeted agents such as tyrosine kinase inhibitors, mammalian target of rapamycin inhibitors, and bevacizumab affect the patterns of failure of RCC after GKS. Methods Between 1999 and 2010, 61 patients with brain metastases from RCC were treated with GKS. A median dose of 20 Gy (range 13-24 Gy) was prescribed to the margin of each metastasis. Kaplan-Meier analysis was used to determine local control, distant failure, and overall survival rates. Cox proportional hazard regression was performed to determine the association between disease-related factors and survival. Results Overall survival at 1, 2, and 3 years was 38%, 17%, and 9%, respectively. Freedom from local failure at 1, 2, and 3 years was 74%, 61%, and 40%, respectively. The distant failure rate at 1, 2, and 3 years was 51%, 79%, and 89%, respectively. Twenty-seven percent of patients died of neurological disease. The median survival for patients receiving targeted agents (n = 24) was 16.6 months compared with 7.2 months (n = 37) for those not receiving targeted therapy (p = 0.04). Freedom from local failure at 1 year was 93% versus 60% for patients receiving and those not receiving targeted agents, respectively (p = 0.01). Multivariate analysis showed that the use of targeted agents (hazard ratio 3.02, p = 0.003) was the only factor that predicted for improved survival. Two patients experienced post-GKS hemorrhage within the treated volume. Conclusions Targeted agents appear to improve local control and overall survival in patients treated with GKS for metastatic RCC.

PMID: 22385005 [PubMed - as supplied by publisher]