Breast cancer intracranial metastases stereotactic radiosurgery

Options such as stereotactic radiosurgery for breast cancer intracranial metastases can increase survival to 12 months or longer.

Case series

2016

Between December 2001 and May 2015, 111 patients with brain metastases from breast cancer were grouped by potential prognostic factors including age at diagnosis, Karnofsky Performance Score (KPS), number of brain metastases, and whether or not they received adjuvant treatments such as whole brain radiotherapy (WBRT) or surgical resection. Survival rates were determined for all groups, and hazard ratios were calculated using univariate and multivariate analyses to compare differences in OS.

Median OS was 16.8 ± 4.22 months. Univariate analysis of patients with a KPS ≤60 and multivariate analysis of KPS 70-80 showed significantly shorter survival than those with KPS 90-100 (5.9 ± 1.22 months, 21.3 ± 11.69 months, and 22.00 ± 12.56 months, P = 0.024 and < 0.001). Other results such as age ≥65 years and higher number of brain metastases trended toward shorter survival but were not statistically significant. No difference in survival was found for patients who had received WBRT in addition to SRS (P = 0.779).

SRS has been shown to be safe and effective in treating brain metastases from breast cancer. Roehrig et al., found a median survival to be 16.8 ± 4.22 months, an increase from other clinical reports. In addition, 38.4% of our population was alive at 2 years and 15.6% survived 5 years. Significant prognostic factors can help inform clinical treatment decisions. This study found that KPS was a significant prognostic indicator of OS in these patients [1)].

2015

131 patients who received SRS for breast cancer BM between 2001 and 2013. Survival was estimated by the Kaplan-Meier method. Effects of tumor biology, number and location of lesions, and number of SRS sessions on survival were evaluated by Cox proportional hazards regression. Of the 122 patients with subtypes available, 41 patients (31%) were classified as estrogen receptor positive/HER2 negative (ER(+)HER2(-)); 30 patients (23%), ER(+)HER2(+); 23 patients (18%), ER(-)HER2(+); and 28 patients (21%), ER(-)HER2(-) (or triple negative breast cancer, TNBC). Median age at first SRS was 50 years. Median overall survival for ER(+)HER2(-), ER(+)HER2(+), ER(-)HER2(+), and TNBC was 16, 26, 23, and 7 months, respectively ($p < 0.001$ for difference between groups). Patients with TNBC had the shortest time to retreatment with WBRT or SRS or death with hazard ratio of 3.12 ($p < 0.001$) compared to ER(+)HER2(-). In all subtypes other than TNBC, SRS can provide meaningful control of BM even in the setting of multiple lesions and may be worth repeating for new lesions that develop metachronously. For patients with TNBC, prognosis is guarded following SRS, and there is an urgent need to develop more effective treatment strategies [2)].

2012

79 consecutive breast cancer patients who received salvage SRS (interval of >3 months after initial therapy), 76 of whom (96%) received prior whole-brain radiation therapy. Overall survival (OS) and central nervous system (CNS) progression-free survival rates were calculated from the date of SRS using the Kaplan-Meier method. Prognostic factors were evaluated using the Cox proportional hazards model.

Median age was 50.5 years. Fifty-eight percent of this population was estrogen receptor positive, 62% was HER2 positive, and 10% was triple negative. At the time of SRS, 95% had extracranial metastases, with 81% of extracranial metastases at other visceral sites (lung/pleura/liver). Forty-eight percent had stable extracranial disease. Median interval from initial brain metastases therapy to SRS was 8.4 months. Median CNS progression-free survival after SRS was 5.7 months (interquartile range [IQR], 3.6-11 months), and median OS was 9.8 months (IQR, 3.8-18 months). Eighty-two percent of evaluable patients received further systemic therapy after SRS. HER2 status (adjusted hazard ratio [HR], 2.4; P = .008) and extracranial disease status (adjusted HR, 2.7; P = .004) were significant prognostic factors for survival on multivariate analysis.

In patients with good Karnofsky performance status, salvage SRS for breast cancer brain metastases is a reasonable treatment option, given an associated median survival in excess of 9 months. Furthermore, patients with HER2-positive tumors at diagnosis or stable extracranial disease at the time of SRS have an improved clinical course, with median survival of >1 year [3].

1)
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2)
Cho E, Rubinstein L, Stevenson P, Gooley T, Philips M, Halasz LM, Gensheimer MF, Linden HM, Rockhill JK, Gadi VK. The use of stereotactic radiosurgery for brain metastases from breast cancer: who benefits most? Breast Cancer Res Treat. 2015 Feb;149(3):743-9. doi: 10.1007/s10549-014-3242-x. PubMed PMID: 25638395; PubMed Central PMCID: PMC4494730.
3)
Kelly PJ, Lin NU, Claus EB, Quant EC, Weiss SE, Alexander BM. Salvage stereotactic radiosurgery for breast cancer brain metastases: outcomes and prognostic factors. Cancer. 2012 Apr 15;118(8):2014-20. doi: 10.1002/cncr.26343. PubMed PMID: 21918959.