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Intraoperative or Postoperative Stereotactic Radiotherapy for Brain Metastases: Time to Systemic Treatment Onset and Other Patient-Relevant Outcomes

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Purpose/Objective

Intraoperative radiotherapy (IORT) has become a viable treatment option for resectable brain metastases (BMs). As data on local control and radiation necrosis rates are maturing, we focus on meaningful secondary endpoints such as time to next treatment (TTNT), duration of postoperative corticosteroid treatment, and in-hospital time.

Material/Methods

Patients prospectively recruited within an IORT study registry between November 2020 and June 2023 were compared with consecutive patients receiving adjuvant stereotactic radiotherapy (SRT) of the resection cavity within the same period. TTNT was defined as the number of days between BM resection and start of the next extracranial oncological therapy (systemic treatment, surgery, or radiotherapy) for each of the groups.

Results

Of 95 BM patients screened, IORT was feasible in 84 cases (88%) and ultimately performed in 64 (67%). The control collective consisted of 53 SRT patients. There were no relevant differences in clinical baseline features. Mean TTNT (range) was 36 (9−94) days for IORT patients versus 52 (11−126) days for SRT patients ($p = 0.01$). Mean duration of postoperative corticosteroid treatment was similar (8 days; $p = 0.83$), as was mean postoperative in-hospital

time (11 versus 12 days; $p = 0.97$). Mean total in-hospital time for BM treatment (in- and out-patient days) was 11 days for IORT versus 19 days for SRT patients ($p < 0.001$).

Conclusion

IORT for BMs results in faster completion of interdisciplinary treatment when compared to adjuvant SRT, without increasing corticosteroid intake or prolonging in-hospital times. A randomised phase III trial will determine the clinical effects of shorter TTNT.