Commentary: Adjuvant Radiotherapy vs Watchful Waiting for World Health Organization Grade II Atypical Meningioma: A Single-Institution Experience

Michael R. Chicoine, MD
Albert H. Kim, MD, PhD

Department of Neurological Surgery, Washington University in St. Louis, St. Louis, Missouri, USA

Correspondence:
Michael R. Chicoine, MD,
Department of Neurological Surgery,
Washington University in St. Louis,
Campus Box 8057,
660 S Euclid Ave,
St. Louis, MO 63110, USA.
Email: chicoinem@wustl.edu

Received, December 21, 2020.
Accepted, December 25, 2020.

We read with interest "Adjuvant Radiotherapy vs Watchful Waiting for World Health Organization Grade II Atypical Meningioma: A Single-Institution Experience."[1] This was a retrospective investigation of a cohort of 162 patients with atypical meningiomas. Based on clinicians' preference, 108 of those patients underwent adjuvant postoperative radiation therapy (RT) and 54 did not. For those patients who underwent RT, all patients (except for 3 that received stereotactic RT) received fractionated external beam RT with doses ranging from 18 to 60 Gy. Multivariate analysis was used to assess the impact of radiation. The authors conclude that radiation is associated with a lower risk of recurrence. The mean time to recurrence in patients who received radiation was 43.7 mo, which is modestly longer than the time for those patients who did not receive radiation, 34.7 mo.

The recurrence-free survival for nonradiated patients vs radiated patients was 80.7% vs 99% at 24 mo, 71.8% vs 98% at 36 mo, and 49.4% vs 93.7% at 60 mo. The authors do not comment on what if any additional treatments were needed for these patients at the time of recurrence, whether that be additional surgery and/or additional radiation treatments or merely more watchful waiting, and more details about the need for additional treatments would be of interest.

This is a cohort of patients similar in size to our report of patients with atypical meningiomas, which was described in a 2-part paper with 210 patients.[2,3] In our series for patients who had gross total resection, although there was a trend toward increased local control with adjuvant RT, delaying radiation until the time of recurrence did not seem to impact overall survival as many of those patients were effectively treated with stereotactic radiosurgery at the time of recurrence. This strategy potentially avoids early administration of radiation to many patients who ultimately might not need it, or who might not need it until a later date. Furthermore, treating upfront with fractionated radiation is typically a complex 6-wk intervention in most cases as opposed to treatment at recurrence, which often might be limited to stereotactic radiosurgery, which often can be accomplished in a single day potentially without any detrimental impact on the patient's overall long-term outcome. We think that further longer-term comparison of the authors' strategy of upfront postoperative RT with other strategies reported in the literature such as ours is still needed.

Another interesting finding in our cohort of patients was that patients with histopathological evidence of spontaneous necrosis in the original tumor specimen seemed not to derive benefit from radiation compared with those patients whose tumors did not have evidence of spontaneous necrosis. These data have been confirmed in an independent cohort.[4] It would be of interest to analyze the authors' cohort with regard to this issue.

It is of course important to note that, as the authors have done, there are limitations of their nonrandomized retrospective study, and the fact that those 170 patients studied were selected from a larger series of 300 patients with atypical meningiomas. There may be inherent biases based on these limitations. Furthermore, they state that "8 (5%) patients received nonadjuvant RT" and these 8 seem to be excluded from the final 162 who were analyzed. Additional details of RT of those 8 patients might be of interest.

Overall, we think this is an excellent review of the authors' experience[1] with managing atypical meningiomas, and this report helps to further inform decision making about whether to pursue radiation or not after resection of atypical management. Although the authors' study may lend some support to the benefits of upfront

postoperative radiation, we think that with the current available evidence, there are other variables to consider, and that a careful-watch-and-wait strategy, and the use of stereotactic radiosurgery for small foci of recurrence, is also another viable strategy to consider.[5] It would also be of great interest to identify upfront the tumors that would benefit from adjuvant RT. We also eagerly await the results of ongoing prospective trials of adjuvant RT for this entity (RTOG 0539 and ROAM/EORTC-1308).

Funding

This study did not receive any funding or financial support.

Disclosures

The authors have no personal, financial, or institutional interest in any of the drugs, materials, or devices described in this article. Dr Chicoine received funding from (1) IMRIS Inc for an unrestricted educational grant to support an intraoperative magnetic resonance imaging (iMRI) database and outcome analysis project, the IMRIS Multicenter intraoperative MRI Neurosurgery Database (I-MiND), (2) The Head for the Cure Foundation, (3) Mrs Carol Rossfeld and The Alex & Alice Aboussie Family Charitable Foundation, and (4) the Subcortical Surgery Group, who provided an unrestricted educational grant.

REFERENCES

1. Bray DP, Quillin JW, Press RH, et al. Adjuvant radiotherapy vs watchful waiting for World Health Organization grade II atypical meningioma: a single-institution experience [published online ahead of print: 2021]. *Neurosurgery*. doi:10.1093/neuros/nyaa580.
2. Sun SQ, Kim AH, Cai C, et al. Management of atypical cranial meningiomas, part 1: predictors of recurrence and the role of adjuvant radiation after gross total resection. *Neurosurgery*. 2014;75(4):356-363.
3. Sun SQ, Cai C, Murphy RKJ, et al. Management of atypical cranial meningiomas, part 2: predictors of progression and the role of adjuvant radiation after subtotal resection. *Neurosurgery*. 2014;75(4):347-355.
4. Garcia-Segura ME, Erikson AW, Jairath R, et al. Necrosis and brain invasion predict radio-resistance and tumor recurrence in atypical meningiomal: a retrospective cohort study. *Neurosurgery*. 2020;88(1):E42-E48.
5. Sun SQ, Cai C, Murphy RK, et al. Radiation therapy for residual or recurrent atypical meningioma: the effects of modality, timing, and tumor pathology on long-term outcomes. *Neurosurgery*. 2016;79(1):23-32.