Neurosurgical Forum LETTERS TO THE EDITOR

Stereotactic laser ablation for hypothalamic hamartomas after SRS failure

TO THE EDITOR: We read with interest the article by Burrows et al.² (Burrows AM, Marsh WR, Worrell G, et al: Magnetic resonance imaging–guided laser interstitial thermal therapy for previously treated hypothalamic hamartomas. *Neurosurg Focus* 41[4]:E8, October 2016).

We previously reported achieving a seizure-free outcome utilizing laser interstitial thermal therapy (LITT) in an adult patient with a hypothalamic hamartoma (HH) after failure of stereotactic radiosurgery (SRS). This article by Burrows and colleagues adds to the collective experience. We agree that LITT is an excellent surgical treatment for epilepsy in this patient population, and there are some alternative technical approaches that we have developed at our center that may be of interest to the reader.

Burrows and colleagues report using a Leksell Frame (Elekta AB) and consulting a stereotactic atlas for planning. They further report developing their stereotactic plan on the day of surgery. Our preference is to develop the plan based on contrast-enhanced MRI ahead of time for improved efficiency and then merge that with a skull-fiducial CT scan on the day of surgery. We also utilize a frameless, robotic stereotactic system (ROSA, MedTech Surgical Inc.).¹ We find that this system allows highly accurate, direct targeting of the lesion without relying on atlases, and detailed planning can be done well in advance. These technical variations can be very helpful at centers where LITT is carried out in a diagnostic rather than an intraoperative scanner.

More importantly, the growing but limited experience in adults with HH and epilepsy demonstrates excellent seizure control but higher rates of hypothalamic dysfunction. The patient in our report, who was treated 1 year ago, has Engel Class I seizure control. He also had an unintentional 20-kg weight loss that has been sustained for 1 year. This is in comparison to the moderate weight gain that Burrows and colleagues reported for 1 patient. Combining our experience with the report of Burrows et al., the rate of hypothalamic complications in adult patients with HH undergoing LITT who have been previously treated with SRS is 50%.

This stands in contrast to Wilfong and Curry's report

of 14 child and adolescent patients with no hypothalamic complications.³ It is unclear whether this difference is a result of the relatively advanced age of Burrows and colleagues' patients or the previous SRS (only 1 patient in Wilfong and Curry's series had a previous SRS treatment).

Although the numbers are small and we are comparing results across 3 separate trials and the purpose of this analysis is clearly only to generate hypotheses, analysis of the data with a Fisher exact test shows that the population in Wilfong and Curry's series had a relative risk (RR) of 0.5 of getting a hypothalamic complication when compared with our report as well as that of Burrows et al. (RR 0.5, 95% CI 0.15–0.85, $p = 0.0392$).

It is clear that LITT as a treatment for adult epilepsy secondary to HH will continue to grow. This is a relatively young treatment, and technical variations and nuances should continue to be encouraged and reported, especially because of the high variability in the availability of resources between different hospitals. Also, it is becoming clear that there may be a different side-effect profile for adult patients with HH undergoing LITT and/or patients with HH previously treated with SRS and now undergoing LITT compared with the landmark series in children.³ Larger reports will be needed to evaluate these issues, but the valuable report by the authors and similar experiences will be important for clinicians as they provide preoperative counseling to patients presenting for this procedure.

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Disclosures

The authors report no conflict of interest.

Response

We are grateful to Dr. Brandmeir and Dr. Sather for their careful reading and thoughtful critique of our recently published manuscript. Their recent case report does add to the growing literature supporting the use of magnetic resonance imaging–guided LITT for epileptic foci, including those within the hypothalamus.¹ The authors report using the ROSA frameless stereotactic system and planning on the day before treatment and suggest that these innovations may be useful in centers without an intraoperative MRI suite. Some centers, such as ours, find the ROSA system appealing but difficult to rationalize in the surgical budget at the current time. The procedures we reported all took place in our intraoperative MRI suite utilizing same-day planning and a Leksell frame. We feel that this approach did not complicate or lengthen the procedure significantly, and we have been very confident in the accuracy. Clearly, different approaches are possible, depending upon the hospital infrastructure and available technology. Furthermore, for tumors that are not in the thalamus, hypothalamus, or brainstem, we are utilizing LITT with frameless targeting similar to what the authors describe, although without the ROSA robot. The authors should be commended on improving this technique to make its application possible in centers without an intraoperative MRI unit.

Although seizure control is possible with this technique, hypothalamic dysfunction appears to be a concern, as noted by Drs. Brandmeir and Sather. This stands in

contrast to complications seen in the pediatric population. As suggested by Drs. Brandmeir and Sather, possible explanations include age-related differences in response and/or a side effect of prior radiosurgery or other previous treatment. As the authors point out, adverse events following treatment may differ based upon the patients' age or prior treatments, and patients should be counseled appropriately. We expect the efficacy of this modality to increase as technical innovations and techniques improve. However we feel that given the reduction in approach-related morbidity with the accuracy offered by the intraoperative MRI and real-time feedback, LITT is here to stay as a treatment for these tumors in otherwise treatment-resistant circumstances.

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