Spinal laser interstitial thermotherapy

The proximity of the spinal cord to compressive spinal metastases limits radiosurgical dosing. Open surgery is used to create safe margins around the spinal cord prior to spinal stereotactic radiosurgery (SSRS) but carries the risk of potential surgical morbidity and interruption of systemic oncological treatment. Spinal laser interstitial thermotherapy (SLITT) in conjunction with SSRS provides local control with less morbidity and a shorter interval to resume systemic treatment. de Almeida Bastos et al. presented a comparison between SLITT and open surgery in patients with metastatic thoracic epidural spinal cord compression to determine the advantages and disadvantages of each method.

This is a matched-group design study comprising patients from a single institution with metastatic thoracic epidural spinal cord compression that was treated either with SLITT or open surgery. The two cohorts defined by the surgical treatment comprised patients with epidural spinal cord compression (ESCC) scores of 1c or higher and were deemed suitable for either treatment. Demographics, pre- and postoperative ESCC scores, histology, morbidity, hospital length of stay (LOS), complications, time to radiotherapy, time to resume systemic therapy, progression-free survival (PFS), and overall survival (OS) were compared between groups.

Eighty patients were included in this analysis, 40 in each group. Patients were treated between January 2010 and December 2016. There was no significant difference in demographics or clinical characteristics between the cohorts. The SLITT cohort had a smaller postoperative decrease in the extent of ESCC but a lower estimated blood loss (117 vs 1331 ml, $p < 0.001$), shorter LOS (3.4 vs 9 days, $p < 0.001$), lower overall complication rate (5% vs 35%, $p = 0.003$), fewer days until radiotherapy or SSRS (7.8 vs 35.9, $p < 0.001$), and systemic treatment (24.7 vs 59 days, $p = 0.015$). PFS and OS were similar between groups ($p = 0.510$ and $p = 0.868$, respectively).

This results have shown that SLITT plus XRT is not inferior to open decompression surgery plus XRT in regard to local control, with a lower rate of complications and faster resumption of oncological treatment. A prospective randomized controlled study is needed to compare SLITT with open decompressive surgery for ESCC [1)].

In 2017 Thomas et al. stated that spinal laser interstitial thermal therapy (LITT) appears to be a promising novel modality for the treatment of epidural metastatic spine disease in patients who are poor candidates for larger-scale oncologic spinal surgery and can act synergetically with spinal stereotactic radiosurgery to maximize local control and palliate pain. This technique is ideally suited for the intraoperative MRI suite to monitor the extent of the ablation in the epidural space. As percutaneous navigation, imaging, and LITT technology improve, broader applicability of this minimally invasive technique in spinal oncology is foreseen [2)].

A study demonstrated the feasibility of image guidance based on MRI to perform laser interstitial thermotherapy of spinal metastasis. The authors' method permits excellent visualization of the spinal cord, improving safety and workflow during laser ablations in the epidural space. The results can be extrapolated to other indications, including biopsies or drainage of fluid collections near the spinal cord [3)].

References

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