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Corticosteroid Use and Its Relation to Post-Operative Edema in Magnetic Resonance guided Laser Induced Thermal Therapy for Recurrent Metastatic Brain Tumors

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Introduction

Magnetic resonance-guided laser-induced thermal therapy (LITT) offers a minimally invasive treatment option for patients who have previously undergone maximum radiation for metastatic brain tumors. In this study, we examine the ability of LITT to alleviate peritumoral edema following ablation.

Methods

In this study we examine the post-operative development of edema and its relation to corticosteroid usage in eleven patients who underwent MRgLITT from 2010 to 2017. Analyses of tumor and edema volumes were done using T1 with contrast for tumors and fluid-attenuated inversion recovery (FLAIR) scans for edema in the ITK- segmentation program. Tumor and edema volumes were quantified for all subsequent follow-up MRIs.

Results

A majority of patients showed a decrease in perilesional edema over time (63.6%) with 71.4% of those showing decreased volume requiring only pre-operative and 1 to 2 week tapered post-operative steroids. In contrast, 75% of patients who showed an increase in perilesional edema required steroids to be continued in the post-operative period.

Learning Objectives

1.)To observe the relationship between post-operative edema and corticosteroid use

2.)To further understand the factors that need to be improved in MRgLITT protocols

3.)To develop an appreciation for the dexterity that MRgLITT affords medical treatment where previously patients and doctors would have been empty handed.

Conclusions

Although LITT has become an integral part of neurosurgery in modern medicine, its short tenure means there is still much to learn about how to ensure maximal efficacy. The use of steroids in conjunction with MRgLITT has yet to be optimized, and here we have seen that often patients with decreased long term intracranial edema spent less time on corticosteroids. Further research is required to determine whether this is cause or effect and how to improve treatment protocols in reference to the amount and length of corticosteroid courses given to patients.