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Laser interstitial thermal therapy for recurrent glioblastomas: a systematic review and metaanalysis

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Abstract

We aim to investigate the efficacy and safety of laser interstitial thermal therapy (LITT) in treating recurrent glioblastomas (rGBMs). A comprehensive search was conducted in four databases to identify studies published between January 2001 and June 2022 that reported prognosis information of rGBM patients treated with LITT as the primary therapy. The primary outcomes of interest were progression-free survival (PFS) and overall survival (OS) at 6 and 12 months after LITT intervention. Adverse events and complications were also evaluated. Eight eligible non-comparative studies comprising 128 patients were included in the analysis. Seven studies involving 120 patients provided data for the analysis of PFS. The pooled PFS rate at 6 months after LITT was 25% (95% CI 15-37%, I² = 53%), and at 12 months, it was 9% (95% CI 4-15%, I² = 24%). OS analysis was performed on 54 patients from six studies, with an OS rate of 92% (95% CI 84-100%, I² = 0%) at 6 months and 42% (95% CI 13-73%, I² = 67%) at 12 months after LITT. LITT demonstrates a favorable safety profile with low complication rates and promising tumor control and overall survival rates in patients with rGBMs. Tumor volume and performance status are important factors that may influence the effectiveness of LITT in selected patients. Additionally, the combination of LITT with immune-based therapy holds promise. Further well-designed clinical trials are needed to expand the application of LITT in glioma treatment.

Keywords: Glioblastoma; Laser interstitial thermal therapy; Literature review; Recurrence; Survival.

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