

Laser interstitial thermotherapy in epilepsy surgery

Besides other innovative [stereotactic procedures](#) ([radiofrequency thermocoagulation](#), [focused ultrasound](#), [gamma knife](#)) [laser interstitial thermotherapy](#) (LiTT) provides [minimally invasive](#) destruction of pathological soft tissues which could be especially relevant for [epilepsy surgery](#) involving adult and pediatric patients. Unlike standard resections, no craniotomy is required; just a tiny borehole trepanation is sufficient. Damage to cortical areas when accessing deep lesions can be minimized or completely avoided, and treating epileptogenic foci near eloquent or even vital brain areas becomes possible.

Hoppe et al. briefly describe the history and rationale of laser neurosurgery as well as the technical key features of the two currently available systems for magnetic resonance-guided LiTT ([Visualase®](#), [NeuroBlate®](#); CE marks pending for both).

They also discuss the published clinical experience with LiTT in the field of epilepsy surgery (approximately 200 cases) with regard to complications, LiTT-induced, long-term brain structural alterations, seizure outcome, preliminary neuropsychological findings and first estimates of treatment costs. Overall, the seizure outcome appears to be slightly worse than for resective surgery. Due to insufficient research methods (e.g. non-established measures, lack of a control condition), the expected neuropsychological superiority over resective surgery has not been unambiguously demonstrated thus far. Also, the cost-benefit ratio requires further critical evaluation. Clinical, multi-center and adequately controlled outcome studies of high quality should also accompany the imminent introduction of LiTT into the field of epilepsy surgery and therewith permit critical scientific evaluation and rational, individual, clinical decisions ¹⁾.

As with any emerging technology, many questions remain unanswered. Continued work is needed to refine the indications for LiTT in cranial and spinal oncology and epilepsy surgery. Furthermore, the technology is far from mature; efficiency and ease of use will need to be improved to aid in broad adaptation of the technique. Many hurdles remain to be overcome, but it appears that LiTT is here to stay as an additional tool in the neurosurgeon's armamentarium, and we are looking forward to following its evolution in the years to come. ²⁾

¹⁾

Hoppe C, Witt JA, Helmstaedter C, Gasser T, Vatter H, Elger CE. Laser interstitial thermotherapy (LiTT) in epilepsy surgery. *Seizure*. 2017 Apr 6;48:45-52. doi: 10.1016/j.seizure.2017.04.002. [Epub ahead of print] Review. PubMed PMID: 28411414.

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Buttrick S, Komotar RJ. Introduction for Laser Interstitial Thermal Therapy (LiTT) in Neurosurgery Supplement. *Neurosurgery*. 2016 Dec;79 Suppl 1:S1-S2. PubMed PMID: 27861319.

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