

## Introduction

Laser interstitial thermal therapy (LiTT) is changing the way we treat mesial temporal epilepsy (MTE). Because LiTT is minimally invasive and does not preclude further treatment, it is on its way to becoming a “first line” treatment for drug resistant MTE patients. However, because LiTT is relatively new, not much is known about associated complications and long-term seizure freedom rates.

## Methods

The medical records of all patients that underwent LiTT for MTE from 2013 to 2017 at the University of Miami hospital under a single surgeon were retrospectively reviewed. Information related to epilepsy history, preoperative clinical evaluations, imaging, and outcomes were compared between seizure free (SF/Engel 1) and non-seizure-free (NSF/non-Engel 1) patients.

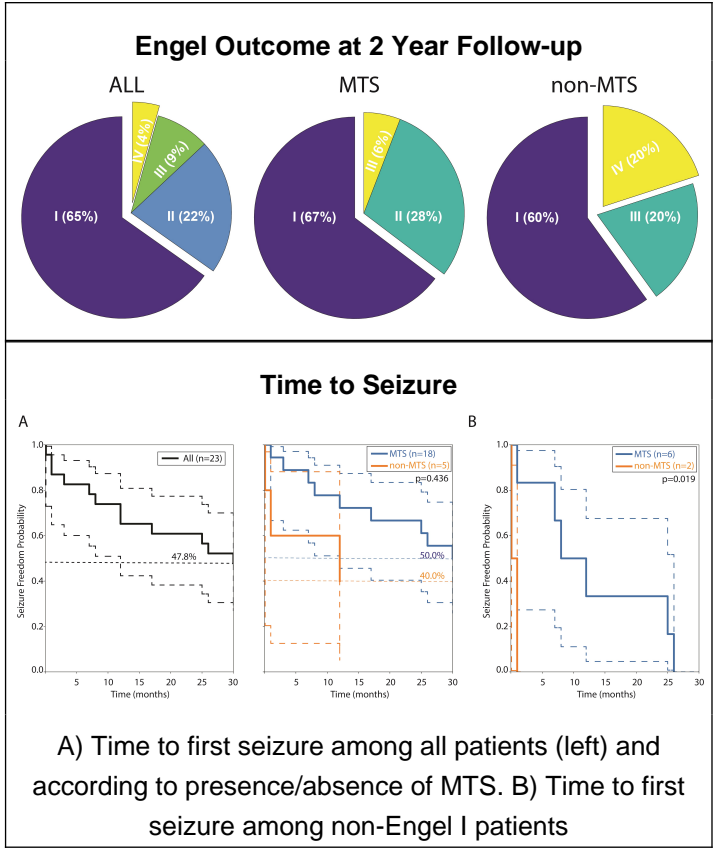
Patient Demographics						
Characteristic	Composite (n=23)	MTS (n=18)	non-MTS (n=5)	P-value	Engel I (n=15)	Non-Engel I (n=8)
Age – yr:std (min,max)	43.3±11.9 (21,60)	46.4±10.4 (24,66)	32.2±11.4 (21,56)	0.01	45.7±12.5 (21, 66)	38.9±9.9 (25,59)
Female sex – no. (%)	9 (39.1)	7 (38.9)	2 (40.0)	0.97	7 (46.7)	2 (25.0)
Years with epilepsy – yr:std (min,max)	30.0 ±11.5 (11,49)	33.4±10.4 (11,49)	17.4±8.8 (14,22)	0.003	30.3 ±11.9 (14,49)	29.3 ±11.0 (11,42)
Number of pre-LiTT AEDs – no. ±std (min,max)	2.4 ±0.9 (1,4)	2.3±0.9 (1,4)	2.6±0.6 (2,3)	0.42	2.3 ±0.9 (1,4)	2.4 ±0.7 (1,3)
Number of post-LiTT AEDs – no. ±std (min,max)	1.96 ±1.1 (0,4)	1.9±0.9 (0,3)	2.0±1.6 (0,4)	0.92	1.7 ±1.0 (0,3)	2.4 ±1.1 (1,4)
PEI hypometabolism – no. (%)	15 (65.2)	12 (66.7)	3 (60.0)	0.79	10 (66.7)	5 (62.5)
Neuropsych Concordant no. (%)	15 (65.2)	13 (72.2)	2 (40.0)	0.20	10 (66.7)	5 (62.5)
Mesial Temporal Sclerosis – no. (%)	18 (78.3)	18 (100)	N/A	N/A	12 (80.0)	6 (75.0)
Length of Follow up – months:std (min,max)	42.3±9.7 (25.3, 56.0)	41.7±9.7 (25.3,56.1)	44.5±10.3 (30.2,52.8)	0.58	42.4±10.4 (25.3,56.1)	42.2±8.6 (30.2,54.0)
Left Side – no. (%)	12 (52.2)	9 (50)	3 (60)	0.71	9 (60)	3 (37.5)

Patients with diagnosis of MTS tended to be older and had a longer history of epilepsy.

## Results

20 patients were identified with at least two years of follow up. Mean age was 43.3±11.9 years and 39.1% were female. After a mean follow-up time of 42.3 months (range 25.3 – 56.0 months), 65.2% (15/23) were free of disabling seizures and 21.7% (5/23) had only rare disabling seizures. Patients had an average epilepsy history of 30±11.5 years and underwent a total 4.6±1.1 ablations, and there was no significant difference in epilepsy history or ablation number between SF and NSF groups. While the presence of mesial temporal sclerosis (MTS) was similar between the SF and NSF groups (80% vs. 75%, p=.79), NSF patients without MTS had a shorter median time to first seizure compared to patients with MTS (0.1 month versus 8 months, log-rank test p=0.019). The post-operative complication rate was 8.7% consisting of one permanent and one transient homonymous hemianopia.

Procedure Outcome Characteristics						
Characteristic	Composite (n=23)	MTS (n=18)	non-MTS (n=5)	P-value	Engel I (n=15)	Non-Engel I (n=8)
Number of Ablations – no. ±std (min,max)	4.6±1.1 (2,6)	4.7±1.0 (2,6)	4.2±1.3 (2,5)	0.4	4.7±0.9 (2,6)	4.5±1.3 (2,6)
Time to first seizure – months. ±std (min,max)	11.5±10.2 (0.1,30)	13.6±10.3 (1,30)	4.4±6.6 (0.1,12)	0.2	11.7±10.7 (1,30)	11.3±10.5 (1,26)
Number seizure-free – no. (%)	11 (57.8)	9 (50)	2 (40)	0.7	11 (73.3)	0 (0)
Intrap. Ablated Volume – cm3. ±std (min,max)	5.4±1.3 (2.5,8.5)	5.3±1.3 (2.5,8.5)	5.7±1.2 (4.5,7.0)	0.5	5.5±1.2 (4.0,8.5)	5.3±1.4 (2.5,6.9)
6 mo Post-op. Ablated Volume – cm3. ±std (min,max)	5.5±0.8 (1.4,8.9)	5.4±0.6 (1.5,7.7)	5.8±1.3 (1.4,8.9)	0.4	5.5±0.8 (1.4,8.9)	5.5±0.8 (1.4,8.7)



## Conclusions

LiTT appears to be a safe and effective initial treatment option in the treatment of medication refractory MTE. Among patients that have seizures after treatment, those without MTS appear to have seizures earlier than those with MTS.