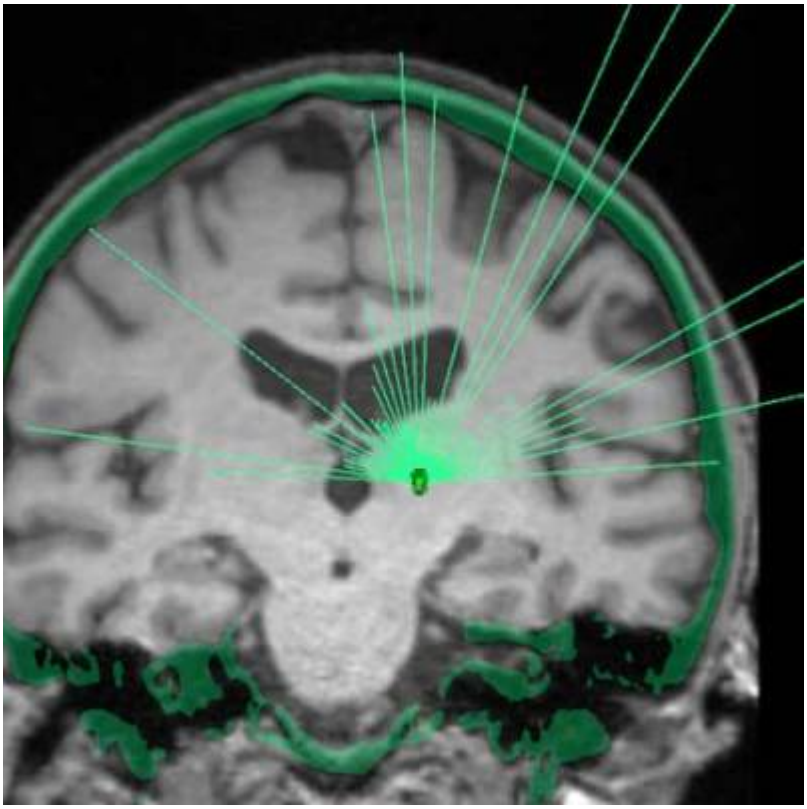
Thalamotomy outcome



There are several different surgical procedures that are used to treat essential tremor (ET), including deep brain stimulation (DBS) and thalamotomy procedures with radiofrequency (RF), radiosurgery (RS) and most recently, focused ultrasound (FUS). Choosing a surgical treatment requires a careful presentation and discussion of the benefits and drawbacks of each.

Dallapiazza et al., conducted a literature review to compare the attributes and make an appraisal of these various procedures. DBS was the most commonly reported treatment for ET. One-year tremor reductions ranged from 53% to 63% with unilateral Vim DBS. Similar improvements were demonstrated with RF (range, 74%-90%), RS (range, 48%-63%) and FUS thalamotomy (range, 35%-75%). Overall, bilateral Vim DBS demonstrated more improvement in tremor reduction since both upper extremities were treated (range, 66%-78%). Several studies show continued beneficial effects from DBS up to five years. Long-term follow-up data also support RF and gamma knife radiosurgical thalamotomy treatments. Quality of life measures were similarly improved among patients who received all treatments. Paresthesias, dysarthria and ataxia were commonly reported adverse effects in all treatment modalities and were more common with bilateral DBS surgery. Many of the neurological complications were transient and resolved after surgery. DBS surgery had the added benefit of programming adjustments to minimise stimulation-related complications. Permanent neurological complications were most commonly reported for RF thalamotomy. Thalamic DBS is an effective, safe treatment with a long history. For patients who are medically unfit or reluctant to undergo DBS, several thalamic lesioning methods have parallel benefits to unilateral DBS surgery. Each of these surgical modalities has its own nuance for treatment and patient selection. These factors should be carefully considered by both neurosurgeons and patients when selecting an appropriate treatment for ET [1].

Gamma Knife thalamotomy (GKT) with a maximal dose of 130 Gy to the VIM is a safe procedure that can replace other surgical procedures [2].

Findings show that magnetic resonance-guided focused ultrasound thalamotomy results in sustained tremor reduction for medically refractory essential tremor even in the long term, and we highlight areas for improvement [3].

Scantlebury N, Meng Y, Lipsman N, Jain J, Dawson D, Schwartz ML. Change in some quality of life domains mimics change in tremor severity after ultrasound thalamotomy. Mov Disord. 2019 Jun 24. doi: 10.1002/mds.27774. [Epub ahead of print] PubMed PMID: 31234223 [4].

References

1)
Dallapiazza RF, Lee DJ, De Vloo P, Fomenko A, Hamani C, Hodaie M, Kalia SK, Fasano A, Lozano AM. Outcomes from stereotactic surgery for essential tremor. J Neurol Neurosurg Psychiatry. 2019 Apr;90(4):474-482. doi: 10.1136/jnnp-2018-318240. Epub 2018 Oct 18. Review. PubMed PMID: 30337440.
2)
Cho KR, Kim HR, Im YS, Youn J, Cho JW, Lee JI. Outcome of gamma knife thalamotomy in patients with an intractable tremor. J Korean Neurosurg Soc. 2015 Mar;57(3):192-6. doi: 10.3340/jkns.2015.57.3.192. Epub 2015 Mar 20. PubMed PMID: 25810859; PubMed Central PMCID: PMC4373048.
3)
Meng Y, Solomon B, Boutet A, Llinas M, Scantlebury N, Huang Y, Hynynen K, Hamani C, Fasano A, Lozano AM, Lipsman N, Schwartz ML. Magnetic resonance-guided focused ultrasound thalamotomy for treatment of essential tremor: A 2-year outcome study. Mov Disord. 2018 Oct;33(10):1647-1650. doi: 10.1002/mds.99. Epub 2018 Oct 4. PubMed PMID: 30288794.
4)
Scantlebury N, Meng Y, Lipsman N, Jain J, Dawson D, Schwartz ML. Change in some quality of life domains mimics change in tremor severity after ultrasound thalamotomy. Mov Disord. 2019 Jun 24. doi: 10.1002/mds.27774. [Epub ahead of print] PubMed PMID: 31234223.