The long-term outcomes of epilepsy surgery

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Background & Intro

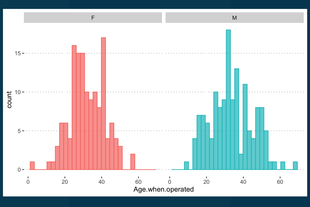
- **Epilepsy**, notably characterized by its **resistance to medical treatments** in up to 30% of patients, brings a big challenge in the field of neurology.
- Among the various forms of epilepsy, Temporal Lobe Epilepsy (TLE) stands out as the most common type resistant to drug treatment, prompting the consideration of surgical options.
- These surgical interventions have demonstrated efficacy in the **short term**, but the l**ong-term outcome of surgery is less frequently documented**. Given that potential candidates for surgery are mostly relatively young adults, understanding the long-term postoperative outcomes are crucial.
- This study aims to **ascertain long-term postoperative seizure freedom rates** to inform future surgical practices and patient decision-making processes.

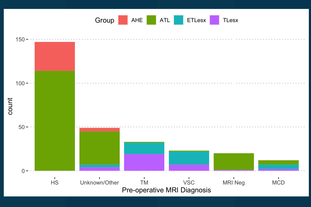
Methods

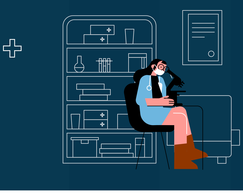
This study is a retrospective analysis of prospectively collected data, Patients recruited are individuals with epilepsy and undergone epilepsy surgery in the UK, they were followed up prospectively at 3 months after surgery and then between 6 and 12 months.

Demographics

After excluding patients with incomplete data, this study included 284 patients, 143 (50.4%) of them are male.







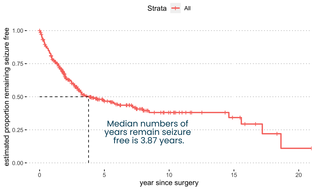
- AHE = amygdalohippocampectomy
- ATL = anterior temporal lobe resection
- ETLesx = extra temporal lesionectomy
- TLesx = temporal lesionectomy
- MCD = malformations of cortical development.
- HS= Hippocampal Sclerosis
- TM = tumor
- VSC = vascular
- MRI Neg = MRI Negative

Statistical Analysis

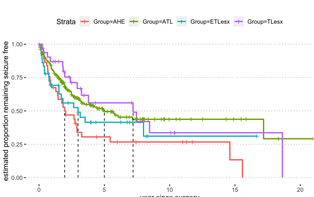
- **Kaplan-Meier survival analysis** estimate the chance to be free of seizures with loss of awareness at various timepoints after surgery. (time-to-event response: The first seizure recurrence times of patients (in years) since they received epilepsy surgery.)
- **Log-rank test** to compare the survival distributions of different operation types/ MRI diagnosis.

Results & Conclusion

1. Seizure Freedom

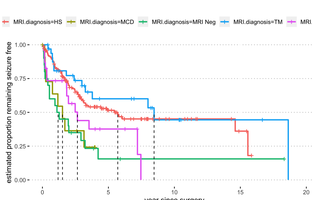


2. Seizure Freedom by Operation Types



strata	median
Group=AHE	1.96
Group=ATL	5.00
Group=ETLesx	2.99
Group=TLesx	7.20

3. Seizure Freedom by Pre-Operation MRI Results



strata	median
MRI.diagnosis=HS	5.710
MRI.diagnosis=MCD	1.520
MRI.diagnosis=MRI Neg	1.185
MRI.diagnosis=TM	8.460
MRI.diagnosis=VSC	2.650

MRI.diagnosis=HS
MRI.diagnosis=MCD
MRI.diagnosis=MRI Neg
MRI.diagnosis=TM
MRI.diagnosis=VSC

4. Log-rank Test

- statistically significant difference
  - ATL and AHE (p = 0.006)
  - AHE and TLesx (p = 0.029) .
- statistically significant difference
  - HS and MCD (p = 0.011)
  - HS and MRI Neg (p = 0.004)
  - HS and VSC (p = 0.033)
  - MCD and TM (p = 0.01)
  - MRI neg and TM (p = 0.003)
  - TM and VSC (p = 0.009)

Limitations

- The study is skewed towards the temporal lobe resections (ATL), as ATL is the most common form of epilepsy surgery performed in large neurosurgical centres.
- As a result of unavailable data, this study did not investigate the issue of outcomes and subsequent post-operative death.

Conclusions

- surgery is **effective** in providing long-term seizure freedom in patients with refractory epilepsy.
- Almost half of all patients remained free from debilitating seizures at five years, and over a third of patients at 10 years.
- **Hippocampal sclerosis** and **ATL** was associated with **positive long-term seizure outcome.**

Mohan, M., Keller, S., Nicolson, A., Biswas, S., Smith, D., Osman Farah, J., Eldridge, P., & Wieshmann, U. (2018). The long-term outcomes of epilepsy surgery. PLOS ONE, 13(5), e0196274.https://doi.org/10.1371/journal.pone.0196274