investigate the role of 7T MRI in relation to EEG abnormalities. 7T RI findings show concordance with clinical data. 7T MRI did not reveal anatomical findings to account for EEG abnormalities, suggesting that such changes may be functional rather than anatomical.

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Quantitative EEG Detects REM Sleep Microstructure

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Background: Rapid eye movement sleep (REM) is divided into phasic and tonic microstates. Phasic REM is defined by presence of REMs with reportedly greater antiepileptic effect. We assessed whether quantitative EEG (QEEG) software can detect REM microstates. **Methods:** We applied artifact reduction and detection trends from QEEG software (Persyst 14) on 18 patients undergoing 30 day-night high density EEG recordings in the epilepsy monitoring unit. We identified phasic REM as 10-second epochs of previously human-scored REM that demonstrated presence of either vertical or horizontal eye movements on the QEEG artifact detection panel. Remaining epochs were identified as tonic REM. **Results:** Out of 91.2 average minutes of REM (range 24.5-167.5) per recording, a mean of 2.5% (range 0-18.9%) demonstrated eye movements intensive enough for QEEG artifact detection to be identified as phasic REM. On average, only 40% (range 0-500%) of eye movements per recording was flagged as vertical. **Conclusions:** These findings provide proof-of-concept that QEEG can automatically assess REM microstructure by readily detecting phasic and tonic REM. These findings also confirm that most REMs are horizontal. Having the ability to easily and automatically detect phasic versus tonic REM can help further future studies examining the antiepileptic effect of REM sleep.

Multi-society

Epilepsy and EEG

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Bi-insular Responsive Neurostimulation Artifact on Scalp Electroencephalogram

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Background: Background: Responsive Neurostimulation (RNS) has proven efficacy in treating medically resistant epilepsy as an intracranial system detecting, recording and treating seizures automatically. No information exists pertaining to artifact characteristics of RNS findings in scalp EEG. **Methods:** A 30 year-old female was diagnosed using intracranial electroencephalography(iEEG), with bi-insular epilepsy, of unknown cause. She presented large number of focal unaware non-motor seizures and seizures with progression to bilateral tonic-clonic. She was implanted with bi-insular RNS. **Results:** During scalp EEG recordings, a prominent artifact was seen corresponding to an automatized discharge suspectedly evoked by the RNS trying to minimize the frequent epileptiform activity in her case. Figure 1 and 2 depict these findings. **Conclusions:** Artifact seen by the RNS in scalp EEG has not been previously described in scientific literature. These findings must be identified to better characterize the role of the RNS in EEG and treatment of seizure activity visible on scalp recordings.

Neuro-oncology

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Clinical prognostic factors in adult intracranial ependymoma patients – A fifty year multi-institutional experience

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Background: Standard of care treatment for adult intracranial ependymoma patients includes maximal safe surgical resection, while the role for adjuvant radiotherapy remains unclear with existing data from small retrospective series'. Accordingly, we built a multi-institutional cohort to assess the prognostic value of adjuvant radiotherapy and other clinical factors in these patients. **Methods:** Patients managed for adult intracranial ependymomas from 1968 onwards within the University Health Network in Toronto, The University of Oklahoma Health Sciences Center, and The Ottawa Hospital were identified. Multivariate models assessing the prognostic value of clinical factors were built using variables with known prognostic value and/or significance in univariate Cox models. **Results:** Of 122 ependymomas, 71% were infratentorial, 78% grade two, 55% gross/near-totally resected (GTR/NTR), and 65% treated with adjuvant radiotherapy. Multivariate analyses identified GTR/NTR (vs. subtotal resection; HR=0.2, 95%CI=0.1–0.4, p<0.0001) and cranial (HR=0.5, 95%CI=0.2–1.1) or craniospinal (HR=0.2, 95% CI=0.04–0.5) radiotherapy receipt (p=0.01) as independent statistically significant predictors of more favourable PFS. Grade II pathology (vs. grade III; HR=0.2, 95%CI=0.05–0.6, p=0.006) and GTR/NTR (vs. subtotal resection; HR=0.1, 95%CI=0.03–0.3, p=0.0001) were independent statistically significant predictors of better OS. **Conclusions:** This work confirms the importance of maximal safe resection for adult intracranial ependymomas and establishes that adjuvant radiotherapy improves progression-free survival in these patients.