**Supplementary Tables**

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| Supplementary Table 1. Psychiatric Diagnoses | | | | |
| Psychiatric Diagnosis | | **Pre- Surgery** | **One-year post surgery** | **P-value** |
| Total |  | **48** | **48** |  |
| No Diagnosis |  | 24 (50%) | 34 (70.1%) | <0.021 |
| Psychotic Disorder | **Total Psychotic Disorder** | **18 (37.5%)** | **9 (18.8%)** | **0.004** |
| Psychotic disorder due to GMC | 16 (33.3%) | 8 (16.7%) |  |
| Brief Psychotic Disorder | 1 (2.1%) | 1 (2.1%) |  |
| Psychotic disorder NOS | 1 (2.1%) | 0 |  |
| Mood Disorder | **Total Mood Disorder** | **8(16.7%)** | **5 (10.4%)** | **0.5** |
| Major depressive disorder | 4 (8.3%) | 4 (8.3%) |  |
| Depressive disorder due to a GMC | 2 (4.2%) | 0 |  |
| Depressive disorder NOS | 2 (4.2%) | 0 |  |
| Adjustment Disorder | 0 | 1 (2.1%) |  |
| Anxiety Disorder | **Total Anxiety Disorder** | **4 (8.3%)** | **4 (8.3%)** | **0.625** |
| Generalised Anxiety Disorder | 1 (2.1%) | 2 (4.2%) |  |
| Social phobia | 1 (2.1%) | 1 (2.1%) |  |
| Panic disorder without agoraphobia | 1 (2.1%) | 0 |  |
| Agoraphobia without panic disorder | 1 (2.1%) | 0 |  |
| Panic Disorder with Agoraphobia | 0 | 1 (2.1%) |  |
| Other | Alcohol Dependence | 1 (2.1%) | 0 |  |
| Supplementary Table 1 outlines the detailed DSM-IV diagnoses based on SCID-I assessment before and after surgery. | | | | |

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| **Supplementary Table 2. Psychiatric outcomes of epilepsy surgery.** | | | | | | | |  | |  |
| **Study** | **Study Type** | **n** | **Surgical Site** | **Follow-up** | **Assessment Tools** | **Outcome Measure** | **Outcome** | **Predictors of outcome** | **De Novo Psychopathology** | |
| Cleary *et al.*, 2012 | Retrospective uncontrolled | 280 | Temporal | 3, 6, 12, 24, 26 and 48 months | Psychiatric Clinical Interview – DSM-IV-TR criteria | Mood and anxiety disorders, PIP, IIP, NES | Pre-surgery 🡪 Current or past psychiatric disorder - 81 (29%); >1 psychiatric disorder – 14. Mood disorders - 18%; PIP - 7%; anxiety disorders - 5%; NES - 3%; IIP - 0.7%.  Post-surgery🡪 105/280 (38%) with psychiatric disorder within 4 years. 54/81 (67%) with persistent psychiatric symptoms post-surgery.  49/81 (61%) continued to receive treatment, 12% (10/81) needed psychiatric hospitalization and one committed suicide within 3 months of surgery. | History of secondary generalised tonic-clonic seizures a significant predictor of de novo psychopathology.  Patients with history of SGTCS + with preoperative psychiatric diagnoses significantly less likely to remain seizure free post-op. | 28% (n=51/280) de novo psychopathology. 18% (n=9/52) with two psychiatric disorders; 49% (25/51) presented within 6 months; 90% (n=46/51) with symptoms persisting for at least 6 months; Depression - 12%; Anxiety disorder - 4.7%; Adjustment Disorder - 1.4%; Interictal psychosis - 1.5%; Postictal psychosis - 1.1%; NES - 1.1% | |
| de Araújo Filho *et al.*, 2012  Filho *et al.*, 2012 | Prospective Uncontrolled | 115 | Temporal | One year | Psychiatric Clinical Interview – DSM-IV and ILAE criteria | Depression  Anxiety  Psychosis  IDD, ERP | Pre-surgery 🡪 Psychiatric disorders - 46/115 (40.8%). MDD 27/115 (23.4%). Anxiety disorders 11/115 (9.5%). Psychotic disorders 7/115 (6.0%). PIP 4/115 (3.4%). IIP 3/115 (2.6%).  Post-surgery 🡪 54% with full remission of symptoms. Psychiatric Disorders -31/115(26.9%). MDD 14/115 - (12.1%). Anxiety disorders - 10/115 (8.6%). IIP 8/115 (6.9%). | Presence of pre-surgical depression, presurgical IP and contralateral epileptiform discharges risk factors for post-surgical psychiatric disorder. Ipsilateral interictal discharges protective factor for post-surgical psychiatric disorder.  Absence of psychiatric disorder associated with more favourable surgical outcome. Pre-surgical MDD associated with non-favourable seizure outcome | 11/115 patients (9.6%)  Psychosis 5/115 (4.4%)  MDD – 3/115 (2.6%)  GAD – 3/115 (2.6%) | |
| Bujarski *et al.*, 2013 | Retrospective Uncontrolled | STL 🡪 14  mtg – SelAH 🡪 15 | Temporal | Mean 6.85 (STL) to 9.7 (mtg-SelAH) years | BDI; MMPI-2 Paranoia Scale | Depression  Anxiety  Paranoia | No differences between groups in anxiety and depression measures post-surgery  Overall increase in paranoia measures in the STL group and a decrease in paranoia measures in mtg-SelAH group. | - | No de novo psychopathology. | |
| Cleary *et al.*, 2013b | Retrospective Controlled | 20 cases (TLE + PIP)  60 control (TLE only) | Temporal | 3,6, 12, 24, 36, 48 months | Psychiatric Clinical Interview – DSM-IV diagnoses | Mood Disorders, Anxiety Disorders, Psychosis, ERP | Pre-surgery🡪 Family psychiatric history more common in TLE+PIP patients and they also had significantly less localized ictal EEG recordings.  Post-surgical 🡪 patients with TLE + PIP more likely to develop de novo psychopathology | History of two or more PIP episodes significantly increased the risk of developing de novo psychopathology within 4 post-surgical years. | 9/20 (45%) with PIP developed de novo psychopathology.  Most apparent within first post-surgical year. 78% persisted for at least 6 months. Depression, n=3; Bipolar disorder, n=1. Interictal psychosis, n=3. Anxiety disorders, n=1.  6/9 (67%) required psychiatric treatment. | |
| Dulay *et al.*, 2013 | Retrospective Uncontrolled | 64 | Frontal | 8 months | BDI-II  TMTB  WCST  FAS language fluency | Depression  Executive Function | Pre-surgery🡪 Depressed – 16. Not depressed - 48. Post-surgery 🡪 Depressed - 2/16 and 6/48. Not depressed - 14/16 and 42/48. | Clinically elevated depressive symptoms pre-surgery a risk factor for post-operative deficits in executive function. | 6/48 reclassified as depressed post-op. | |
| D'Alessio *et al.*, 2014 | Prospective Uncontrolled | 81 pre-surgery  14 with psychosis post-surgery | Pre-surgery🡪Temporal, Frontal.  Post-surgery🡪 Temporal | 2 years | DSM-IV SCID-I Module B  Ictal Classification  GAF | Psychosis | Pre-surgery 🡪 Hx of psychosis – 14/89 (16.8%) [11/89 (78%) with transient psychotic episodes; 3/89 (21%) with chronic psychosis]  Post-surgery measure of patients with pre-surgical psychosis🡪 6/14 (43%) no psychiatric complications, 3/14 (21%) with pre-surgical chronic psychotic symptoms continued to have mild symptoms. | Total GAF scores higher in patients with good seizure outcomes. (71% with Engel Class I-II outcome) | 2/14 (14%) de novo depression  3/14 (21%) acute and transient psychotic symptoms | |
| Desai *et al.*, 2014 | Prospective uncontrolled | 50 | Temporal | 7 days, 3 months | MINI, QOLIE-10, HADS, WHO-5 | Quality of Life, Anxiety, Depression. | Pre-surgery - 26/50 (52%) with Axis-I disorder;  Post-surgery - 30/50 (60%) with Axis-I disorder; 8% increase in psychiatric disorders. Depression + anxiety most common.  QOLIE-10: 5-point improvement in 24 (48%) at 3 months; WHO-5 -- improved from 72.94 to 78.49; HADS-depression - no significant change postop; HADS-anxiety - increased at 7 days but decreased significantly at 3 months | High seizure frequency prior to surgery and seizure occurrence after surgery predicted psychiatric disorder presence post-surgery. | 10/50 (20%) with de novo psychiatric disorder post surgery. 4 with depression, 3 with anxiety, 2 with de novo mania + comorbid anxiety, 1 with de novo psychosis+ comorbid depression. | |
| Hamid *et al.*, 2014 | Prospective uncontrolled | 379 | Mixed | 3 months, 1year, 2years, 3years, 4years, 5years | QOLIE-89, BDI, BAI | Quality of Life, Depression and Anxiety | Post-surgery 🡪 Improvement in QOL scores over time and in depression and anxiety symptoms. | Depression and anxiety significantly and negatively associated with QOL.  Improved but incomplete seizure control associated with significant improvement in QOL. | - | |
| Barbieri *et al.*, 2015 | Retrospective uncontrolled | 248 | Mixed | 6 months, 12 months | Psychiatrist evaluation – DSM-IV TR criteria | Depression | Pre-surgery🡪 51/248 (20.6%) with depression.  Post-surgery 🡪 67/248 (27%) developed depressive episode. 60/67 (89.6%) in 6 months. | Lifetime depression, age  at surgery, age at surgery and Levetiracetam as risk factors for post-operative depression.  Carbamazepine and anxiety disorders protective factors for post-operative depression. | 40/67 (59.6%) with de novo depression (35/40 at 6 months) | |
| Buranee *et al.*, 2016 | Prospective uncontrolled | 189 | Mixed | 24 months | Clinical interview - epilepsy related psychosis criteria | ERP, IDD | Pre-surgery 🡪 ERP 33/189 (17.5%), psychotic aura 7.9%, ictal psychoses 3.7%, peri-ictal psychoses 4.2%, inter-ictal psychoses 5.3%.  Post-surgery 🡪 significant reduction in ERP (4.2%); psychotic aura 0.5%, ictal psychoses 1.1%, peri-ictal psychoses 0.5%, inter-ictal psychoses 0.5%.  Seizure reduction in greater than 90% in both patients with and without ERPs. | No significant association between ERPs and surgical outcome or epilepsy-related characteristics. | 4 patients with de novo interictal psychosis. | |
| Landais *et al.*, 2016 | Prospective uncontrolled | 10 | Temporal (DNET) | 5-8years | Clinical interview – DSM-IV-TR and ICD-10 criteria | Inter-ictal psychiatric disorders, personality traits | Pre-surgery 🡪 5/10 with psychiatric disorder. 4/10 with personality traits. 2 with borderline personality, 1 with intermittent explosive disorder and slight mental deficiency, 1 with personality disorder NOS, 1 with undifferentiated schizophrenia.  Post-surgery: 5/5 with dramatic improvement. | - | No de novo cases. | |
| Ramos-Perdigués *et al.*, 2016 | Prospective controlled | Cases: 84; Controls: 68 | Mixed | 6 months | SCID-IV CV, HADS, SCL-90-R | IDD, IPD, Anxiety, Depression | Pre-surgery SCID-IV assessment --Affective disorder – 23.2%, Anxiety – 15.9%, Psychosis – 4.9%.  Post-surgery 🡪 No statistically significant changes between cases and controls in DSM-IV diagnosis at 6 months.  Reductions in psychopathologic outcomes. Reduction in anxiety and depressive symptoms and distress perception in surgical group, increase in anxiety in control group. | Pre-surgical psychiatric functioning and surgery main predictors for post-surgery psychiatric disorders. | Post-surgery 🡪 Affective + psychotic disorders: 4.6%  Anxiety disorders: 6.2% | |
| Ives-Deliperi and Butler, 2017 | Prospective Uncontrolled | 25 | Temporal | One year | QOLIE-89, BDI-II, BNT | Depression  Quality of Life  Language | Pre-surgery🡪 44% with mild to severe mood disturbance.  Post-surgery 🡪 16% of with clinically significant reductions in mood disturbance; 76% with significant improvement in quality of life scores; 48% with significant decline in naming. 65% seizure free. | No significant correlation between seizure status and changes in depression, quality of life or language measures at one-year post-surgery.  Increased depressive symptoms correlated with decreased quality of life. | - | |
| Iranzo-Tatay *et al.*, 2017 | Prospective uncontrolled | Baseline - 72; 6 and 12 months - 56 | Temporal | 6 months, 12 months | HARS, HDRS, BPRS | Anxiety, Depression, Psychosis | Significant improvement in anxiety and psychosis measures over time post-surgery. Treatment offered to 10/72 patients at baseline. Resolution of psychopathology at 6 months in 6/10 and at 12 months in 5/10 (data not available for the remaining 4 and 5 respectively). | History of mental illness a risk factor for depression, anxiety and psychosis post-surgery. | 3 with de novo psychosis + 7 with de novo anxiety/depression at 6 months, resolved at 12 months. | |
| Prayson *et al.*, 2017 | Retrospective uncontrolled | 228 | Temporal, Frontal | 6 months | PAI | Somatic Complaints, Anxiety, Anxiety-Related Disorders, Depression, and Mania | Overall improvement.  Most frequent improvements post TLR.  Left sided resections 🡪 Symptom improvement in all four scales following TLR, no improvement post FLR.  Right-sided resections🡪improvement post both TLR and FLR on somatic complaints, anxiety and depression scales. | Surgical lateralization and localization important factors in psychological outcome. | 4-14% of patients with clinically significant worsening of mood and anxiety following left-sided TLR. | |
| Ramos-Perdigués *et al.*, 2018 | Prospective controlled | Cases - 84; Controls - 68 | Mixed | 12 months | SCID-IV CV, HADS, SCL-90-R | IDD, IPD, Anxiety, Depression | Non-surgical group🡪 only improvement in anxiety measures using the HADS at 12 months.  Surgical group 🡪 Statistically significant improvement in both anxiety and depression using HADS and in all symptom dimensions in the SCL-90 as well as severity, distress and total symptoms. Clinically significant improvement for depression + IDD but not for SCID, SCL-90 subscales or IPD. | Main predictors of psychiatric disorders post-surgery 🡪 seizure frequency, presurgical psychiatric symptoms and 6-month post-surgery psychiatric outcomes, antiepileptic and psychiatric treatment. | Surgical group:  Affective – 3%  Psychotic – 5%  Anxiety – 5% | |
| Supplementary Table 2 summarizes recent studies examining psychiatric outcomes of epilepsy surgery. Cleary et. al. and Macrodimitris et al. have previously published reviews of studies prior to 2012 examining psychiatric outcomes of epilepsy surgery. (Cleary *et al.*, 2013a; Macrodimitris *et al.*, 2011)  BAI -Beck Anxiety Inventory; BDI - Beck Depression Inventory; BPRS - Brief Psychiatric Rating Scale; BNT - Boston Naming Test; DSM - Diagnostic and Statistical Manual of Mental Disorders; DSM-IV-TR - Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision; EEG – Electroencephalograph; ERP- epilepsy related psychoses; FLE - frontal lobe epilepsy; FLR - frontal lobe epilepsy; GAF - Global Assessment of Functioning; HADS – Hospital Anxiety Depression Scale; HARS - Hamilton Anxiety Rating Scale; HDRS - Hamilton Depression Rating Scale; ICD - International Classification of Disease; IDD - interictal dysphoric disorder; IIP - interictal psychosis; IPD – interictal psychotic disorder; ILAE - International League Against Epilepsy; MDD – Major Depressive Disoder; MINI – Mini International Psychiatric Interview; MMPI-2 - Minnesota Multiphasic Personality Inventory, scale 2; mtg-SelAH - trans–middle temporal gyrus selective amygdalohippocampectomy; n, sample size; PAI -Personality Assessment Inventory; PIP - postictal psychosis; QOL - Quality of Life; QOLIE-10 - Quality of Life in Epilepsy questionnaire; SCID - Structured Clinical Interview for DSM; SCID-IV-CV - Structured Clinical Interview for DSM Fourth Edition, Clinician Version; SCL-90-R - Self-Report Symptom Inventory; SGTCS - secondary generalized tonic-clonic seizures. STAI - State-Trait Anxiety Inventory; STL – standard temporal lobectomy; TLE - temporal lobe epilepsy; TLR - temporal lobe resection; TMTB - Trail Making Test Part; WCST - Wisconsin Card Sorting Test. WHO-5 - World Health Organization Five Well-Being Index | | | | | | | | | | |

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