Psychiatric problems related to epilepsy surgery

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Patients’ Expectations of epilepsy surgery

Seizure freedom?
Patients’ Expectations of epilepsy surgery

End of injuries

Improvem

ent of personal freedom

Seizure freedom

Higher quality of life

Independence
Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

Normalization of Quality of Life Three Years after Temporal Lobectomy: A Controlled Study

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Summary: Purpose: The goal of epilepsy surgery is not only to control precipitously intractable seizures, but also to improve quality of life (QoL) of the patient. Our aim was to assess, in our Middle Eastern population, the QoL of patients with temporal lobe epilepsy (TLE) 3 years after temporal lobectomy as compared to medically treated patients and to matched healthy controls. Methods: Twenty consecutive TLE patients who underwent temporal lobectomy 3 years previously were matched on the following variables: age, sex, seizure frequency, seizure duration, age at onset of epilepsy, duration of epilepsy, and number of medications, with 17 TLE patients who underwent the presurgical evaluation and infratemporal lobectomy surgery but not the surgery. They were then matched for age, sex, educational level, income, and residence with 20 healthy individuals. All groups were interviewed by using the EQ-5D questionnaire. Results: Compared with the nonsurgery group, QoL was significantly better in the surgery group (SF-36 scores were in the well-being, functioning, and role-physical domains). QoL was similar in the surgery and healthy control in all domains also included. The nonsurgery group scored significantly lower than healthy controls in the role-physical and role-emotional domains. Conclusions: Temporal lobectomy was associated with improved QoL despite continued attempts to optimise medical therapy. Three years after temporal lobectomy, QoL in our patient population achieved levels similar to those of matched healthy individuals. To our knowledge, this is the first study to report normalization of QoL after temporal lobectomy, in any population. Key Words: QoL—temporal lobe epilepsy—lobectomy.

Three years after temporal lobectomy QoL of patients after epilepsy surgery (n=20) was compared to QoL of matched healthy controls (n=20) and of medically treated nonsurgery patients (n=17).

"QoL was similar in the surgery and healthy control groups in all domains and scales. The nonsurgery group scored significantly lower."

Good news: Health in its complex sense may be in reach after surgery!
Meta-analysis of studies on the longterm, non-seizure outcomes after ES (quality of life, educational and employment status, interpersonal relationships and social behaviour)

“Non-controlled studies consistently reported improved long-term psychosocial outcomes, but the effect was less clear in controlled studies.”

There may be a tendency (of patients as well as doctors) to gloss over the facts: Such a costly operation must have been a success!
Expectations of Patients

- **Health domains**
  - Physical
    - seizure-stop
    - mobility
  - Mental
    - mood
    - concentration
  - Social
    - friendships
    - vocational
    - satisfaction

Probability of fulfillment
Pts. with change expectations in *practical domains*,
(e.g. drivers’ licence, improvement in daily activities)

...compared to

Pts. with expectations of *complex changes*
(e.g. psychosocial affaires, new friendships)

Better seizure prognosis
Higher contentment after surgery

*Wilson et al. (1998)*
Pts. with change expectations in *practical domains*,
(e.g. driver's licence, improvement in daily activities)

...compared to

Pts. with expectations of *complex changes*
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Better seizure prognosis

Higher contentment after surgery

*Wilson et al. (1998)*
Predictors of realistic change expectations

- Solid family background
- Stable preoperative affective situation

Realistic expectations concerning surgery

Higher contentment after surgery

Wheelock et al. (1998)
Derry & Wiebe (2000)
QoL of patients after surgery was found to be better than before surgery. But there were some negative influences:

- Postop. seizure frequency
- AED

Comorbidity
# Psychiatric Comorbidity in Candidates for Epilepsy Surgery

<table>
<thead>
<tr>
<th>Study</th>
<th>Comorbidity Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jensen &amp; Larsen 1979</td>
<td>&gt; 80%</td>
</tr>
<tr>
<td>Polkey 1983</td>
<td>43%</td>
</tr>
<tr>
<td>Naylor et al. 1994</td>
<td>43% both pre- and postop; (35% preop)</td>
</tr>
<tr>
<td>Manchanda et al. 1996</td>
<td>47%</td>
</tr>
<tr>
<td>Ring et al. 1998</td>
<td>52%</td>
</tr>
<tr>
<td>Blumer et al. 1998</td>
<td>57%</td>
</tr>
<tr>
<td>Glosser et al. 2000</td>
<td>51%</td>
</tr>
<tr>
<td>Koch-Stoecker 2001 (own data of 100 patients)</td>
<td>43% psych. syndromes (Axis 1 DSM) (72% incl. Axis 2: personality disorder)</td>
</tr>
<tr>
<td>Inoue &amp; Mihara 2001</td>
<td>35%</td>
</tr>
<tr>
<td>Malmgren et al. 2002</td>
<td>44.3%</td>
</tr>
<tr>
<td>Wrench et al. 2004</td>
<td>57%</td>
</tr>
<tr>
<td>Jones et al. 2005</td>
<td>49% (Axis 1) not only surgery candidates</td>
</tr>
<tr>
<td>Cankurtaran et al. 2005</td>
<td>27.3% (n=22)</td>
</tr>
</tbody>
</table>
Preoperative Psychopathology and Seizure Outcome

Naylor et al. 1994, 37 patients with surgery for mTLE
Preop. psychopathology and seizure outcome

Results of 191 pts. with TL-resection 6 months after surgery

own results, Bethel
Personality disorders are *enduring* patterns of thoughts, emotions, and actions which differ considerably from expectations of socio-cultural surroundings and lead to *impairment and suffering*.

Personality disorders are caused by *organic dispositions* and negative developmental and *environmental influence*.

Personality disorders indicate a *high mental vulnerability* and compromise the brain's ability to combat stress.

Thus it may be hypothesized that patients with personality disorders are at a strong risk to suffer from postoperative psychiatric complications.
Personality disorders predict postoperative complications

During a follow-up period of two years after surgery fourteen of 100 patients were admitted to a psychiatric hospital for different reasons (postoperative complications).

All 14 had personality disorders before surgery (= no patient without PD was admitted!) (p<0.01)

S. Koch-Stoecker (Epilepsy & Behavior, 2002, 3, 526-531)
“Personality disorders as predictors of severe postsurgical psychiatric complications in epilepsy patients undergoing temporal lobe resections”
Affective Disorders

About 80% of epilepsy patients are acquainted with depressive mood. (Mendez et al. 1986)

Depression, not seizure frequency predicts QoL in treatment resistant epilepsy. (Boylan et al. 2004)

Depression in epilepsy patients is atypical. (Blumer 1997)

Major depression (DSM IV):
Episodes lasting for two weeks and more:
severely depressed mood,
no interests, worthlessness...
„for most of nearly every day...“

Interictal dysphoric disorder
Depressed mood of brief duration (hours or days at maximum),
paroxysmal irritability,
short euphoric intervals,
atypical pains...
Postoperative depression, evolving from early postoperative irritations, has the features of a major depression.

For most patients this kind of severe depression is unknown and frightening!
Postoperative Depression

Hill 1957

- 10% of resected patients
- Independence of seizure outcome
- Duration: <18 months after surgery

Naylor et al. 1994: 8% AHE
Ring et al. 1998: 17% (3 months po)
Glosser et al. 2000: 8%
Koch-Stoecker 2001: 9%
Glosser et al. 2000
Koch-Stoecker 2001

Similar time-frame described by all working groups
Predictors of Postoperative Depression: Morphology

**Bruton 1988:**
Preferred incidence of depression after surgery in **hippocampal sclerosis** or in nonlesional epilepsies

**Anhoury et al. 2000:**
- **Good psychiatric outcome** associated with **developmental lesions** (marginally significant)
- **Poor psychiatric outcome** was positively associated with preoperative **bilateral independent spike discharges** at telemetry.
- **Size of resection** positively correlated with postop. emotional lability
**Predictors: Laterality**

- **Bruton et al. 1988:** Depression preferred in *nondominant* resections.
- **Naylor et al. 1994:** *Postoperative* depression was more frequent in *right temporal* resections (4 of 5 pts).
- **Kohler et al. 1999:** *Presurgical* affective disorders: more common in the *right temporal* epilepsy group.
- **Glosser et al. 2000:** At *any time* pre- and postop.: *Right temporal* lobe patients were more symptomatic psychiatrically.
- **Own results, Bethel, 100 pts. (2001):**
  - Preop mood disorders: 15 of 21 *right temporal (71%)*
  - Postop new MDDs: 7 of 9 *right temporal (78%)*
- **Quigg et al. 2003:** Postop depression preferred in *right* resections.
Predictors: Psychiatric Precondition

- Improvements of aggressive behaviours
- Aggressive behaviour may change into depression (in some patients)
  *Hill 1957 and Taylor 1987*

- Correlation between preoperative postictal psychosis and postoperative depression.
  *Kanemoto et al. 1998, own experience in Bethel*

- High presurgical depression-related morbidity (affective instability) leads to a high probability of depression within the first year after surgery.
  *Quigg et al. 2003*
Postoperative depression: Models of explanation

- Process of scarring
- Surgical complication
- Predominance of inhibition-processes
- Interruption of production of endogenous opioids
- New psychosocial demands
- "Burden of normality"
- Unrealistic change expectations

"Organic" reasons
Psychosocial reasons
Postoperative Depression: Treatment

Preoperative comprehensive information

Psychotherapy if problems with psychosocial adaptation

Antidepressant medication: safe, indicated, good response rates

SSRI: Citalopram or Sertralin

Mirtazapin (in pts. with sleep disorders)
Psychoses
in the perioperative context

Meta-analysis on frequencies: 0 – 35%

Higher rates in early studies (1959-1975)

Variability due to methodological issues

Last years: more sophisticated studies

Differentiation between preoperative and de novo psychoses

But still: no controlled studies
Postictal Psychosis

Incidence in surgical candidates

18%
Umbricht et al. 1995

6%
Koch-Stoecker 2002

13%
Kanemoto et al. 1995
Postictal Psychosis

Postoperative Development

Persistence of psychosis: No patient

Postoperative depression:
- 60% (Kanemoto et al. 1995)
- 50% (Koch-Stoecker 2002)

Postictal psychosis can be called an indication for epilepsy surgery!

But: Patients have to be informed about their increased depression risk
**Chronic Interictal Psychosis**

CIIPs (psychosis not correlated to seizure activity) were seen as contraindications for epilepsy surgery during the first 30 years of ES.

Reason for contraindication:
Fear of worsening of psychosis due to surgery.
Chronic Interictal Psychosis

No persistent worsening of psychoses after surgery has been observed (Taylor, 1972)

Some cases of amelioration of psychosis observed (Jensen & Larsen 1979, Taylor 1987)

Psychotic patients are “better off” without seizures (Fenwick 1988)

Directly after surgery an exacerbation of psychosis may happen (own centre, Bethel)

No absolute contraindication!

But: good information before and solid rehabilitation after surgery are essential (Krahn et al. 1996)
# De novo psychosis after epilepsy surgery

<table>
<thead>
<tr>
<th>Author</th>
<th>Total n</th>
<th>New-onset psychosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simmel 1958</td>
<td>44</td>
<td>4 (9.0%)</td>
</tr>
<tr>
<td>Taylor 1972</td>
<td>100</td>
<td>7 (7.0%)</td>
</tr>
<tr>
<td>Jensen 1979</td>
<td>74</td>
<td>9 (12.1%)</td>
</tr>
<tr>
<td>Polkey 1983</td>
<td>40</td>
<td>2 (5.0%)</td>
</tr>
<tr>
<td>Walker 1984</td>
<td>50</td>
<td>6 (12.0%)</td>
</tr>
<tr>
<td>Bruton 1988</td>
<td>248</td>
<td>9 (3.6%)</td>
</tr>
<tr>
<td>Bladin 1992</td>
<td>107</td>
<td>2 (1.9%)</td>
</tr>
<tr>
<td>Leinonen 1994</td>
<td>57</td>
<td>3 (5.2%)</td>
</tr>
<tr>
<td>Naylor 1994</td>
<td>37</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Koch-Stoecker 1997</td>
<td>100</td>
<td>5 (5.0%)</td>
</tr>
<tr>
<td>Anhoury 2000</td>
<td>109</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Kanemoto 2001</td>
<td>52</td>
<td>2 (3.8%)</td>
</tr>
<tr>
<td>Mayanagi 2001</td>
<td>70</td>
<td>2 (2.9%)</td>
</tr>
<tr>
<td>Cankurtaran 2005</td>
<td>22</td>
<td>1 (4.5%)</td>
</tr>
<tr>
<td><strong>Σ</strong></td>
<td>1010</td>
<td>47 (4.8%)</td>
</tr>
</tbody>
</table>

253 pts. 5 psychoses

5 psychoses
De novo Psychoses after Surgery: Aetiological models

Psychosis after surgery in patients with ongoing seizures: new “postictal psychosis”
(Savard et al. 1998, Christodoulou et al. 2002)

Psychosis with postoperative freedom of seizures: alternative psychosis under conditions of forced normalization
(Mace & Trimble 1991)

Surgery as a trigger of a latent readiness of psychosis in highly vulnerable patients
(Ferguson et al. 1993, Koch-Stoecker 1997)
De novo Psychoses after Surgery: Morphology

A correlation between new-onset-psychoses and tumor resection, especially gangliogliomas oder DNET has been described (Bruton 1988, Andermann et al. 1998)

Andermann et al. reported 6 cases of psychoses from 4 different centres, all had gangliogliomas, no other lesion-type led to psychosis.

…but this finding is equivocal… (maybe the psychoses in pts. with gangliogliomas are more odd, intense, visible, and thus easier to be diagnosed)

Because of the small number of patients with those aetiologies multicenter-studies should be performed.
De novo Psychoses after Surgery: Laterality

Predominant occurrence in pts. with *non-dominant* resections.
(Mace & Trimble 1991; own results: Bethel)

... in contrast to *interictal epilepsy psychoses* which occur preferably with focus in the *dominant* hemisphere. (Flor-Henry 1969)
De novo Psychoses after Surgery: Psychiatric Predictors

All de novo psychoses in patients with personality disorders. (Bethel)

Predominantly paranoid personality features (reproaches, devaluation and mistrust in social relationships)

But also avoidant persons with low IQ and little competence to cope with stress
**De novo Psychoses after Surgery: Symptomatology**

| Often starting with sleep disorders, and depressed mood, followed by a successive development of delusions and paranoid phantasies, which deal with one's own social role (being stigmatized, being haunted...) normally starting within the first two postoperative years (but often later than postop. depression) |
| Or: After a seizure-relapse (as an acute psychotic event) with hallucinatory symptoms (delusion of influence by laser, idea of microchips implanted during surgery...) |

**Chronicity of new psychosis is rare, but it happens!**
De novo Psychoses after Surgery: Treatment

Risk minimisation:
- Identify persons at risk before surgery,
- Elaborate appropriate rehabilitation plans
- Get the families of pts. involved

Optimize seizure situation:
- Antiepileptic drugs,
- Second resection

Early application of antipsychotic medication:
- e.g. risperidone (or olanzapine)
- If necessary in combination with antidepressants
Non-epileptic Attacks after Surgery

If psychogenic nonepileptic seizures co-exist with epileptic seizures before surgery...

... surgery should only be performed when an effective psychotherapeutic process is running.

... better wait for some months under treatment, when in doubt!
### Non-epileptic Attacks after Surgery

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>Glosser et al. 1999</td>
</tr>
<tr>
<td>5%</td>
<td>Ney et al. 1998</td>
</tr>
<tr>
<td>4%</td>
<td>Own results: Bethel</td>
</tr>
</tbody>
</table>

### Suspicious symptoms

- New seizure type after surgery,
- Derealisations,
- Depersonalisations,
- Other dissociative symptoms
## Non-epileptic Attacks after Surgery

### Predictors

- **Gender:** female  
  (Glosser et al. 1999, own results: Bethel)

- **Seizure onset:** adulthood  
  (Glosser et al. 1999)

- **IQ:** low  
  (Ney et al. 1998)

- **Laterality:** right  
  (Glosser et al. 1999, own results: Bethel)

- **Preop. psychopathology:** high  
  (Ney et al. 1998)

- **Laterality:** left  
  (Ney et al. 1998)

- **Preop. psychopathology:** Borderline  
  (own results: Bethel)
Conclusions

Preoperative psychiatric disorders may have a strong influence on the course and outcome of epilepsy surgery, concerning quality of life and even seizure outcome.

For mentally stable persons epilepsy surgery is an optimal condition for better health and better quality of life.

For mentally vulnerable persons (especially those with personality disorders) epilepsy surgery may be a strong stressor and may additionally evoke new psychiatric disorders after surgery.
Conclusions

This does not mean to exclude psychiatric patients from ES,...

... but to assess all patients and start treating their disorders already during the preop. period.

Do not start an epilepsy surgery program without access to solid psychiatric counselling ...
Reference:

Koch-Stoecker, S., Kanemoto K.

Psychiatry and surgical treatment.

Thank you for your attention!