

Evaluation of neurosurgical resection strategies in temporal lobe epilepsy

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Registration date 21/08/2008	Overall study status Completed	<input type="checkbox"/> Protocol
Last Edited 28/08/2008	Condition category Nervous System Diseases	<input type="checkbox"/> Statistical analysis plan
		<input checked="" type="checkbox"/> Results
		<input type="checkbox"/> Individual participant data

Plain English summary of protocol
Not provided at time of registration

Contact information

Type(s)
Scientific

Contact name
Prof Johannes Schramm

Contact details
Sigmund-Freud-Str. 25
Bonn
Germany
53105

Additional identifiers

Study information

Scientific Title
Prospective and randomised multicentre trial investigating the pros and cons of different extent of mesial resection in surgery for mesial temporal lobe epilepsy

Study objectives
There is an ongoing debate about the mesial resection extent in the surgical treatment of temporal lobe (TL) epilepsy patients and its relation to seizure freedom and neuropsychological outcome. Surgical resection strategies developed from larger resections removing up to 2/3 of the temporal lobe to more selective and smaller resection types.

The objective of this study is to assess the significance of the extent of resection of mesial structures (hippocampus and parahippocampus) to achieve seizure freedom after surgery for temporal lobe epilepsy.

The main goals of this project are to test two hypotheses:

1. Smaller TL resections are associated with less neuropsychological deterioration
2. Post-operative seizure freedom is comparably good in smaller mesial resection

Ethics approval required

Old ethics approval format

Ethics approval(s)

Ethics approval received from the Ethics Committee of the University of Bonn Medical Centre on the 2nd February 2001 (ref: 237/00)

Study design

Prospective, interventional, randomised multicentre study

Primary study design

Interventional

Study type(s)

Treatment

Health condition(s) or problem(s) studied

Intractable mesial temporal lobe epilepsy (MTLE)

Interventions

As part of the presurgical evaluation patients underwent neuropsychological testing and MRI scanning. Healthy volunteers also underwent neuropsychological testing to serve as a control group regarding the cognitive abilities of the patients.

Patients were randomised to either a short (2.5 cm of hippocampal resection) or a long (3.5 resection length) resection group. The length of resection was to be determined intra-operatively after the opening of the temporal horn by using millimetre paper from the anterior tip of the temporal horn backwards placed on the hippocampal head along its length axis. Furthermore, manual volumetry of structural MRI datasets was used to evaluate the intended resection length.

Post-operatively, patients are seen for MRI-scanning, neuropsychological testing and medical consultation 3, 6 and 12 months after surgery.

Intervention Type

Other

Phase

Not Specified

Primary outcome(s)

Seizure freedom at one year after surgery: defined as class I in the Engel Outcome Scale. The Engel Outcome Scale is administered post-operatively and determines the improvement

/worsening after surgical intervention as follows:

1. Engel class I: seizure-free
2. Engel class II: almost seizure-free
3. Engel class III: significant seizure reduction
4. Engel class IV: no significant improvement

Patients belonging to Engel class I are termed as seizure free, the remaining patients (Engel II - IV) as non-seizure free patients in the present study.

Secondary analysis:

Seizure freeness in subgroups (based on neuropathological analyses), e.g. patients with mesial temporal sclerosis.

Key secondary outcome(s)

Neuropsychological testing:

Each patient underwent comprehensive neuropsychological testing pre-operatively and 12-months post-operatively. For the comprehensive purpose of this study, various neuropsychological parameters are aggregated, resulting in scores for seven major cognitive domains:

1. Verbal learning and memory: two parallel versions of a pre- and post-operative verbal learning test (Verbaler Lern- und Merkfähigkeitstest [VLMT]). The VLMT (German adaptation of the Rey Auditory Verbal Learning Test) requires five trials of learning and recall of a word list consisting of 15 words, free recall immediately after distraction (learning/recall of a second list in one trial) and a recall after a half-hour delay, which is followed by a recognition trial (list with original words plus distractors).
2. Figural learning and memory was obtained using the DCS-R, a German revised version of the DCS, a design list learning test (Diagnostikum für Zerebralschädigung)
3. Language functions:
 - 3.1. Confrontation naming, Boston Naming Test
 - 3.2. Phonematic and semantic fluency
 - 3.3. Token Test, a subtest of the Aachener Aphasie-Test (a German test battery for aphasia) which is seen to measure verbal comprehension
4. Attention functions:
 - 4.1. D2-Test, a letter cancellation test
 - 4.2. The c.I.T., a short test to measure cerebral insufficiency (Kurztest für cerebrale Insuffizienz)
5. Psychomotor speed, mental tracking and cognitive flexibility:
 - 5.1. Trail Making Test A and B (TMT-A/B)
 - 5.2. Motoric sequences after Lurija
 - 5.3. Purdue Pegboard
 - 5.4. Finger Tapping Test
6. Visual and spatial abilities:
 - 6.1. Subtest LPS-7 of the Leistungsprüfsystem (LPS), a German intelligence battery
 - 6.2. The Mosaic-Test, a subtest of the German version of the Wechsler Adult Intelligence Scale-Revised (HAWIE-R)
 - 6.3. Labyrinth test
7. Behaviour and personality features:
 - 7.1. German version of the Beck Depression Inventory (BDI)
 - 7.2. FPZ (Fragebogen zur Persönlichkeit bei zerebralen Erkrankungen), an unpublished German CNS-disease related personality questionnaire
 - 7.3. Quality of Life Inventory in Epilepsy, 10-item version (QOLI-10)

All neuropsychological results were classified into five categories (0 = noticeably abnormal, 1 = moderately abnormal, 2 = borderline, 3 = without pathological findings, 4 = above average).

Completion date

30/06/2008

Eligibility

Key inclusion criteria

1. Patients suffering from intractable temporal lobe epilepsy
2. Drug resistance: seizure history lasting more than two years
3. Pre-surgical evaluation led to the recommendation of either a partial temporal lobe resection combined with amygdalohippocampectomy or a more restricted selected selective amygdalohippocampectomy (SAH)
4. Only cases with mesial involvement were included
5. Patients had to be at least 18 years old (either sex) and able to understand the study plan
6. Written informed consent

Participant type(s)

Patient

Healthy volunteers allowed

No

Age group

Adult

Lower age limit

18 years

Sex

All

Key exclusion criteria

1. Previous temporal lobe surgery
2. Inability to do undergo neuropsychological testing because of retardation or foreign language
3. Mesial resection restricted to uncus and amygdala
4. No usable pre-operative magnetic resonance imaging (MRI) for volumetrical analyses
5. Pathology not allowing for randomisation (far dorsal reaching resection necessary)

Date of first enrolment

15/10/2002

Date of final enrolment

30/06/2008

Locations

Countries of recruitment

Germany

Study participating centre
Sigmund-Freud-Str. 25
Bonn
Germany
53105

Sponsor information

Organisation

German Research Council (Deutsche Forschungsgemeinschaft [DFG]) (Germany)

ROR

<https://ror.org/018mejw64>

Funder(s)

Funder type

Research council

Funder Name

German Research Council (Deutsche Forschungsgemeinschaft [DFG]) (Germany)

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary

Not provided at time of registration

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	Cortical damage results ():	01/02/2004		Yes	No
Results article	Neuropsychological outcome results ():	01/07/2004		Yes	No
Results article	One year follow-up results ():	01/08/2004		Yes	No

Results article	Children and aduly comparative study results ():	01/12/2005		Yes	No
Results article	MRI volumetry results ():	01/03/2007		Yes	No
Results article	Memory and non-memory function results ():	01/01/2008		Yes	No
Results article	Cognitive rehabilitation results ():	01/04/2008		Yes	No
Results article	Prospective study results ():	01/08/2008		Yes	No
Other publications	Research ():	01/12/2007		Yes	No
Other publications	Comment ():	01/02/2008		Yes	No
Other publications	Review ():	01/08/2008		Yes	No
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes
Study website	Study website	11/11/2025	11/11/2025	No	Yes