

Vilka resultat ger epilepsikirurgi?

Anna Edelvik
Specialistläkare, doktorand
Sahlgrenska Universitetssjukhuset
Göteborg

För- och nackdelar med epilepsikirurgi

- **Positivt**

- ❖ Anfallsfri eller avsevärt förbättrad
- ❖ Kunna sätta ut läkemedel
- ❖ Bättre HRQoL



- **Negativt**

- ❖ Kvarstående anfall
- ❖ Risk för komplikationer
- ❖ Förutsägbara negativa effekter

Vad vill patienterna veta?

- Vad är mina chanser att bli anfallsfri, eller i alla fall förbättrad?
- Vilka allvarliga risker finns det med kirurgi?
- Om jag blir anfallsfri, kommer jag att fortsätta vara det?
- Betyder det att jag är botad från min epilepsi?
- Kan jag sluta med medicinerna?
- Kommer jag att få ett bättre liv efter operationen?

RCTs in epilepsy surgery

- Wiebe 2001
 - A randomised prospective study comparing surgical and medical treatment of TLE
 - Single centre
 - 80 patients
 - Duration 1 year
 - Single blind

RCT of surgery for TLE

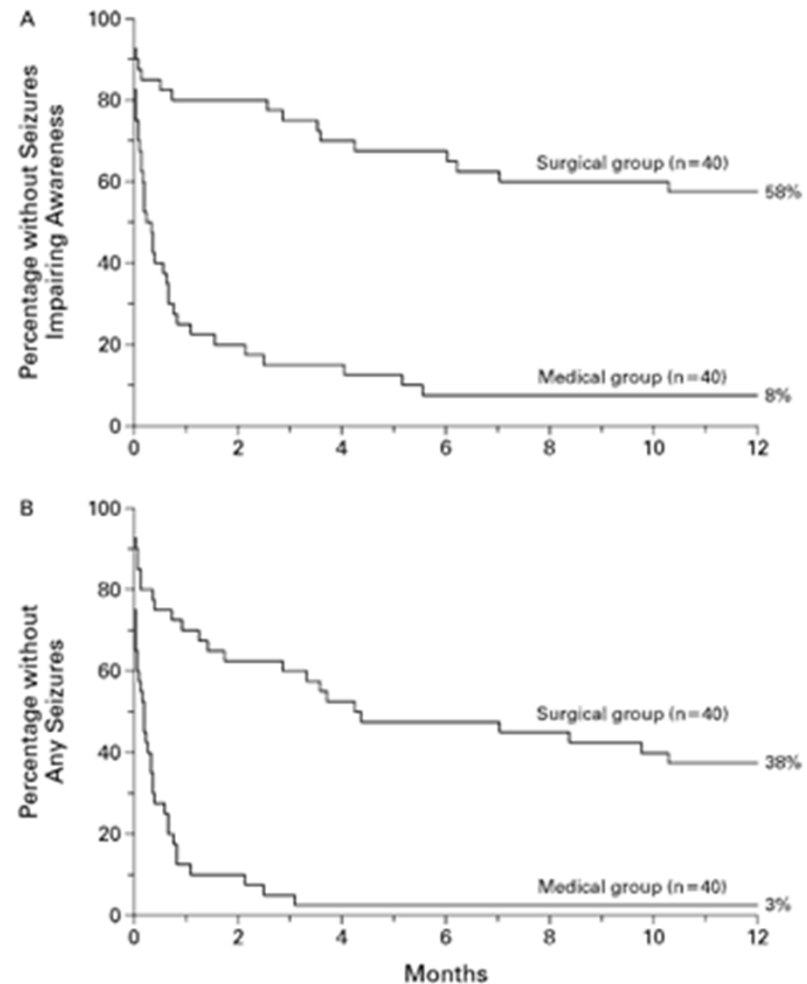
- **80 patients** with TLE were randomly assigned to surgery (40 patients) versus AED treatment for one year (40 patients)
- Optimal medical therapy and primary outcomes assessed by epileptologists unaware of treatment assignments
- Primary outcome: freedom from seizures with impairment of awareness

Wiebe et al 2001

RCT of surgery for TLE

- At one year **58%** in the surgical group (64% of operated) vs **8%** in the medical group were free from seizures with LOC ($p < 0.001$)
- Four patients (10%) had adverse effects of surgery. One patient in the medical group died

Wiebe et al 2001



TLE – practice parameter

- Systematic review and analysis of the literature since 1990: 415 /1282 original citations, 2250 patients
 - 1 Class I RCT of TLE
 - 24 Class IV series of TLR resections
 - Surgical outcome was consistent, differed little among stratifications and on average identical to those of the Class I study
 - The benefits of anteromesial temporal lobe resection for disabling complex partial seizures is greater than continued treatment with antiepileptic drugs, and the risks are at least comparable.

The ERSET study

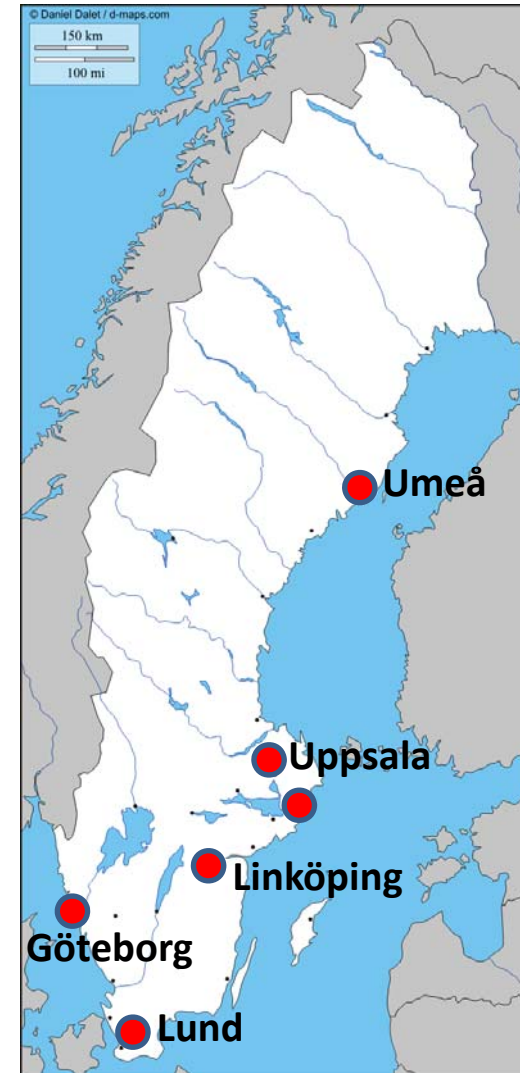
- The **E**arly **R**andomized **S**urgical **E**pilepsy **T**rial
- Multicentre study (16 US centres)
- Patients randomised to early TLR or continued AED treatment
- Planned enrolment 200, final number 38
- **11/15** in surgical group and **0/23** in medical group were seizure free year 2 of follow-up

Outcomes of Frontal Lobe Resections

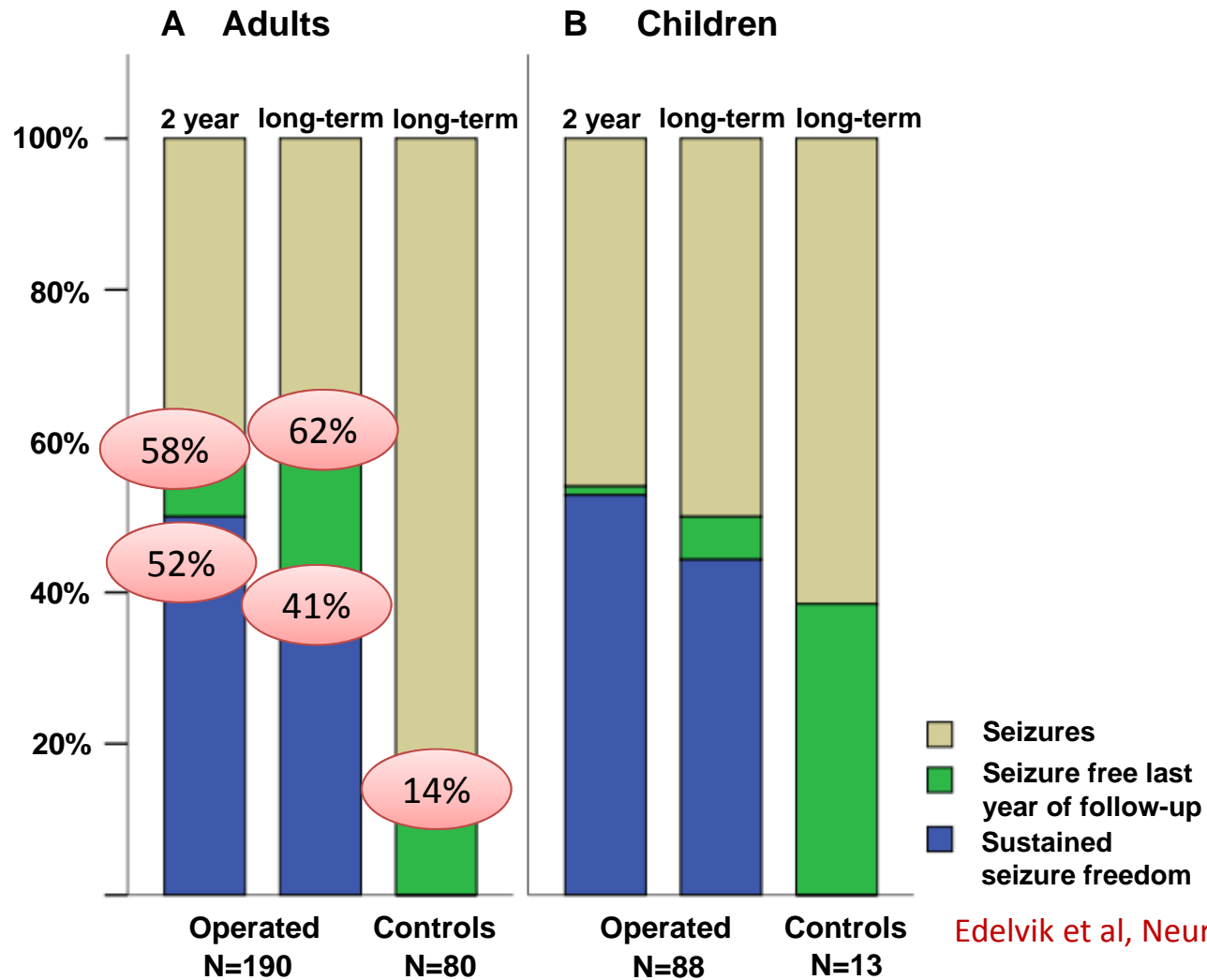
- Second-most common resection type
- No RCT
- One systematic review and meta-analysis of 21 studies including data from 1199 patients
 - Prospective or retrospective case series
- 45% seizure free at 2 years (Engel class 1)

Epilepsikirurgi i Sverige

- 6 opererande centra
- Alla operationer rapporteras till Svenska Epilepsikirurgiregistret
- Prospektivt, longitudinellt, populationsbaserat kvalitetsregister
- Uppföljningar efter 2, 5, 10 och 15 år



Anfallsoutcome



Edelvik et al, Neurology 2013

Long-term seizure outcomes

- From a number of methodologically sound studies around **50%** of adults have been continuously free from seizures with impairment of consciousness since resective surgery
- A higher proportion of patients have been seizure-free at least a year at each time-point assessed

Malmgren et al, in press

Predictors for long-term seizure outcomes

Positive predictors:

- Lesion on MRI
- Positive histopathology

Negative predictors:

- GTCS at baseline
- Long epilepsy duration
- Higher age at surgery
- High baseline seizure frequency
- Postoperative interictal epileptiform discharges
- Early postoperative seizures

Predictors for long-term seizure outcomes

Positive predictors:

- Lesion on MRI
- Positive histopathology

Negative predictors:

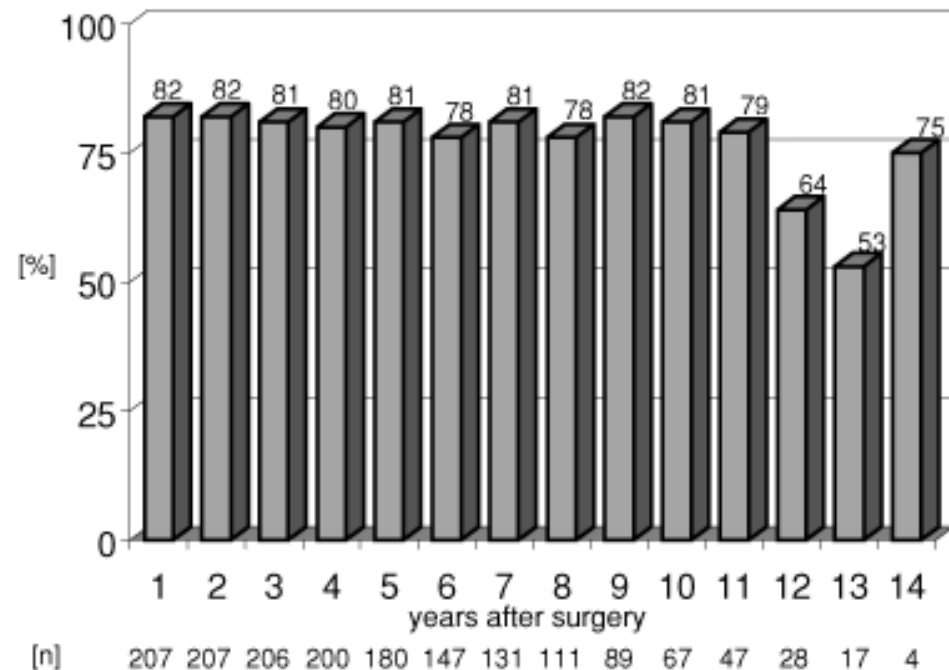
- GTCS at baseline
- Long epilepsy duration
- Higher age at surgery
- High baseline seizure frequency
- Postoperative interictal epileptiform discharges
- Early postoperative seizures

Glioneuronal tumours

- Systematic review of seizure outcomes after resection of GGL and DNET:
- Evaluation of 910 patients from 39 studies
- **80%** seizure-free after surgery (Engel class I)

The Spectrum of Long-term Epilepsy-associated Tumors: Long-term Seizure and Tumor Outcome and Neurosurgical Aspects

- Single centre series from Bonn
- 207 patients followed, median follow-up 8 years
- **82%** of patients seizure free (Engel class I)
- Stable percentage of seizure free patients over 10 years of follow-up



Predictors for long-term seizure outcomes

Positive predictors:

- Lesion on MRI
- Positive histopathology

Negative predictors:

- GTCS at baseline
- Long epilepsy duration
- Higher age at surgery
- High baseline seizure frequency
- Postoperative interictal epileptiform discharges
- Early postoperative seizures

RESEARCH PAPER

Surgical outcomes in patients with epileptogenic tumours and cavernomas in Sweden: good seizure control but late referrals

Bertil Rydenhag,¹ Roland Flink,² Kristina Malmgren¹

► An additional table is published online only. To view this file please visit the journal online (<http://dx.doi.org/10.1136/jnnp-2012-302449>).

¹Epilepsy Research Group, Institute of Neuroscience and Physiology, Sahlgrenska Academy, Göteborg University, Göteborg, Sweden

²Department of Clinical Neurophysiology, Akademiska University Hospital, Uppsala, Sweden

Correspondence to

Professor B Rydenhag, Epilepsy Research Group, Institute of Neuroscience and Physiology, Sahlgrenska Academy, Göteborg University, Per Dabbsgatan 14, 1 tr, SE 413 45 Göteborg, Sweden; [beritil.rydenhag@neuro.gu.se](mailto:bertil.rydenhag@neuro.gu.se)

ABSTRACT

Purpose Seizure outcome after epilepsy surgery is to an important extent related to underlying aetiology. In this study of patients who underwent epilepsy surgery with a lesional aetiology in Sweden 1990–2004, the aim was to investigate seizure outcome and prognostic factors.

Methods All patients operated on during the time period with a histopathological diagnosis of an epileptogenic tumour (ganglioglioma (GGL), dysembryoblastic neuroepithelial tumour (DNET) and low grade astrocytoma (AST)) or a cavernous haemangioma (CAH) were identified in the population based Swedish National Epilepsy Surgery Register. Univariate and multivariate analyses were performed to determine the independent contribution of the following variables to seizure outcome: age at surgery; epilepsy duration; preoperative seizure frequency; localisation of the resection; and histopathology.

Results Of the 156 identified patients who had a 2 year follow-up (103 adults and 53 children), 71% had temporal, 16% frontal and 13% parietal and occipital lobe resections.

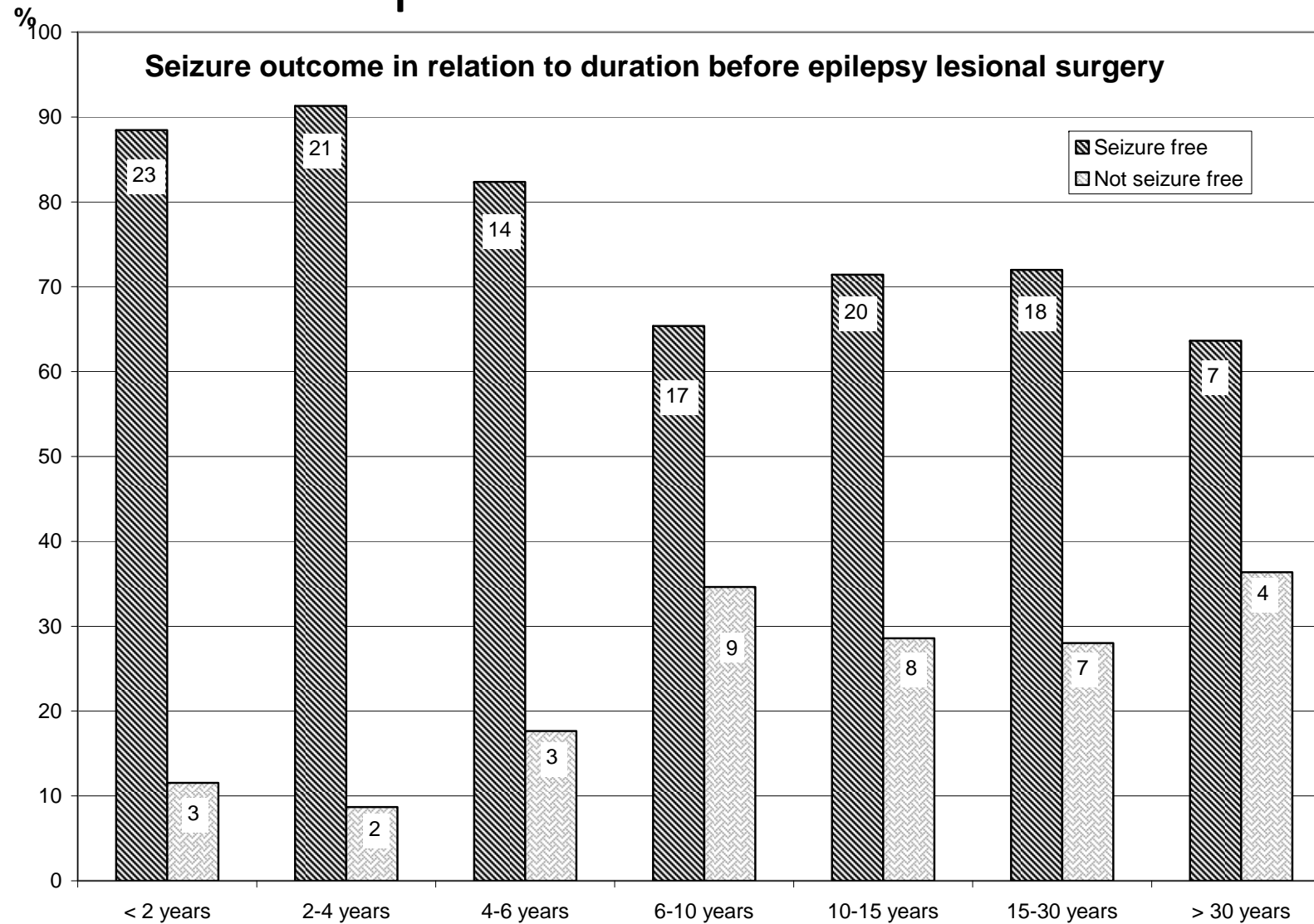
which have been associated with better seizure outcome are short duration of epilepsy, single EEG focus, diagnosis other than astrocytoma, low preoperative seizure frequency and absence of preoperative generalised tonic–clonic seizures.^{8–14}

However, the proportions of different epileptogenic lesions in different epilepsy surgery series vary widely, which may explain some of the differences between series.

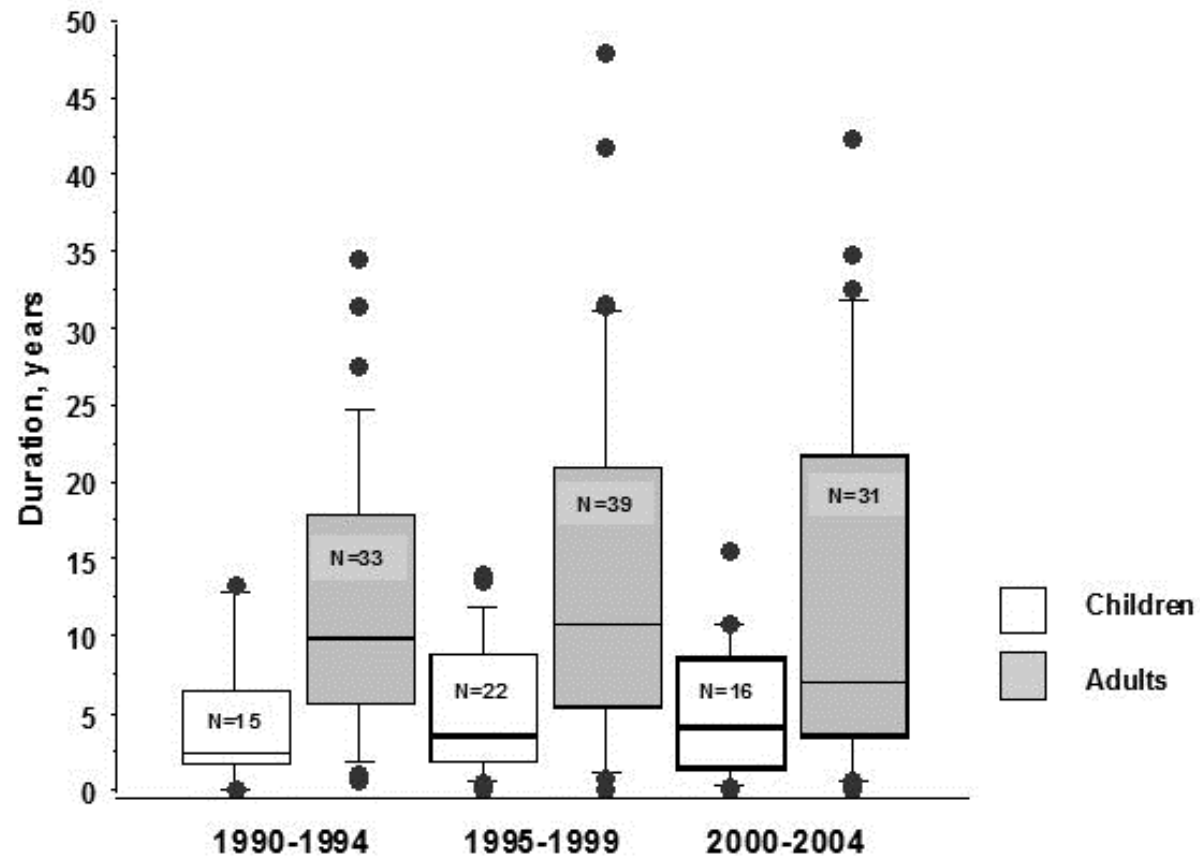
The aim of the present study was to analyse data from the population based Swedish National Epilepsy Surgery Register 1990–2004 with regard to resective epilepsy surgery in patients with epileptogenic tumours or cavernomas underlying their drug resistant epilepsy, to describe the proportions of different lesions as well as resection types, and to search for predictive factors for seizure freedom 2 years after surgery.

Patients and methods

Epileptogenic lesions: Epilepsy duration is important for seizure outcome



Epilepsy duration before surgery in children and adults: three five-year periods



Long-term outcomes of XTLR

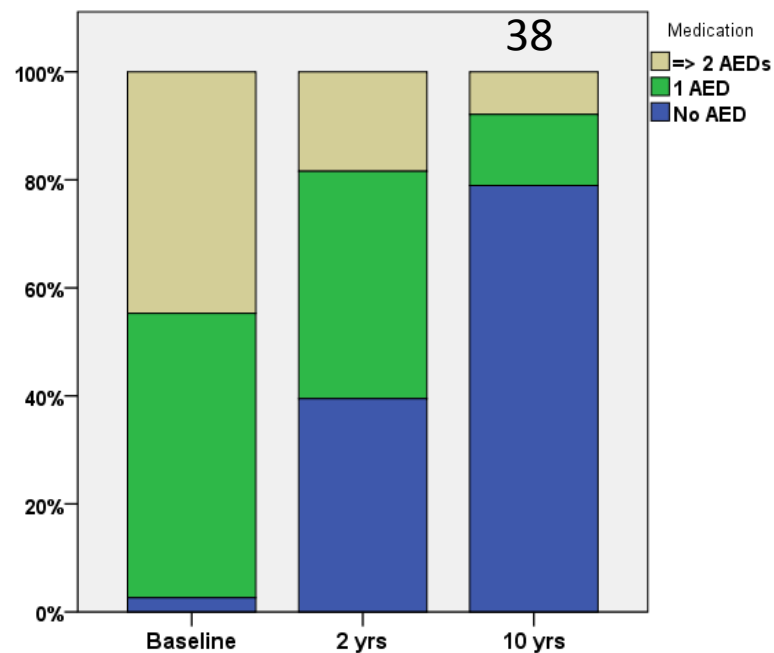
- Few longitudinal studies with information on sustained seizure freedom since surgery.
- Five years postoperatively:
 - 15% (Engel I) McIntosh, 2012
 - 27% (Engel I) Jeha, 2007
 - 35% after FLR (Engel I a+b)
 - 33% in other XTLR (Engel I a+b) Edelvik et al, 2013
 - 47% (Engel I)
 - 35% (Engel I a) Elsharkawy, 2008

AED withdrawal in adults in single centre studies

- UCL study:
 - Single centre observational follow-up of 615 patients
 - **28%** (104/365) of seizure free adults had discontinued AED [de Tisi et al 2011](#)
- Study of TLR from India:
 - Single centre study of 258 patients in whom AED withdrawal was preplanned
 - **63%** discontinued AED [Rathore et al 2011](#)

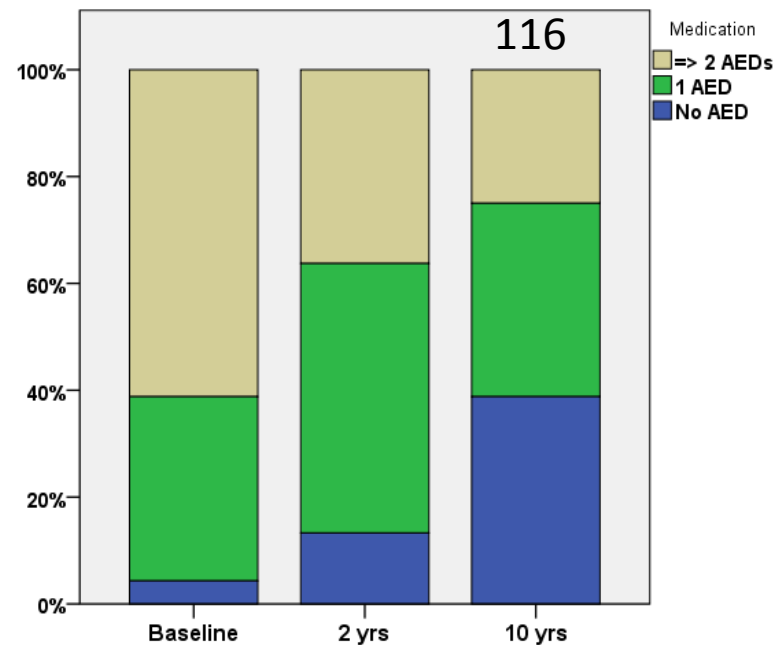
AED medication 2 and 10 years after surgery in seizure-free patients

Children



10 yrs:30/38 (79%) AED free

Adults



10 yrs:45/116 (39%) AED free

Arbete

- En av de vanligaste förhoppningarna med kirurgi är att kunna arbeta mer eller 'bättre'
- Få studier, mest tvärsnitts-studier
- Svårt att dra generella slutsatser då patientens ålder och samsjuklighet har stor betydelse
- Tvärsnitts-studier är även konjunkturberoende
- Våra pågående studier visar att starkaste prediktorn för heltidsarbete efter epilepsikirurgi är att man arbetade innan (OR 6-14) därefter att bli anfallsfri (OR 2-3)

HRQoL after epilepsy surgery

- HRQoL improves after epilepsy surgery in patients who are seizure-free or who obtain $\geq 75\%$ reduction in seizure frequency

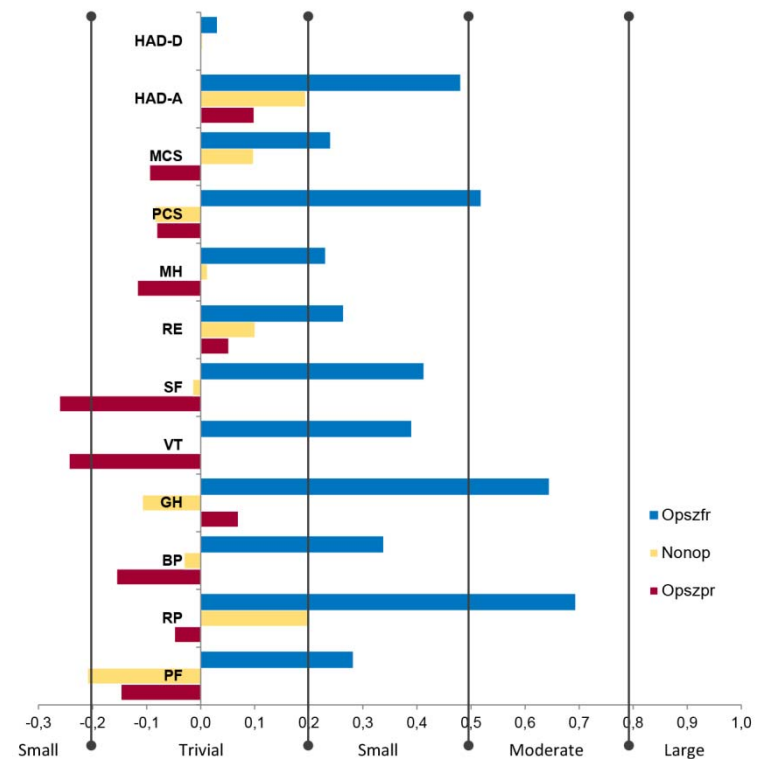
Wiebe et al 2001, Seiam et al 2011, Spencer et al 2007,
Langfitt et al 2007, Taft et al 2014

Health-related quality of life, mood and patient satisfaction after epilepsy surgery in Sweden – a prospective controlled observational study

- Of 141 patients, 96 were operated, 45 were not
- Questionnaires at baseline and 2-year follow-up: SF-36, HAD and patient satisfaction
- Seizure-free patients reached the same levels as the norm in all SF-36 domains except Social Function
- HAD-A (anxiety) scores improved in only the seizure-free patients
- Only half of the operated seizure-free patients achieved important HRQOL improvements
- 86% of all operated considered that they had benefited, 20% thought that surgery caused some harm.

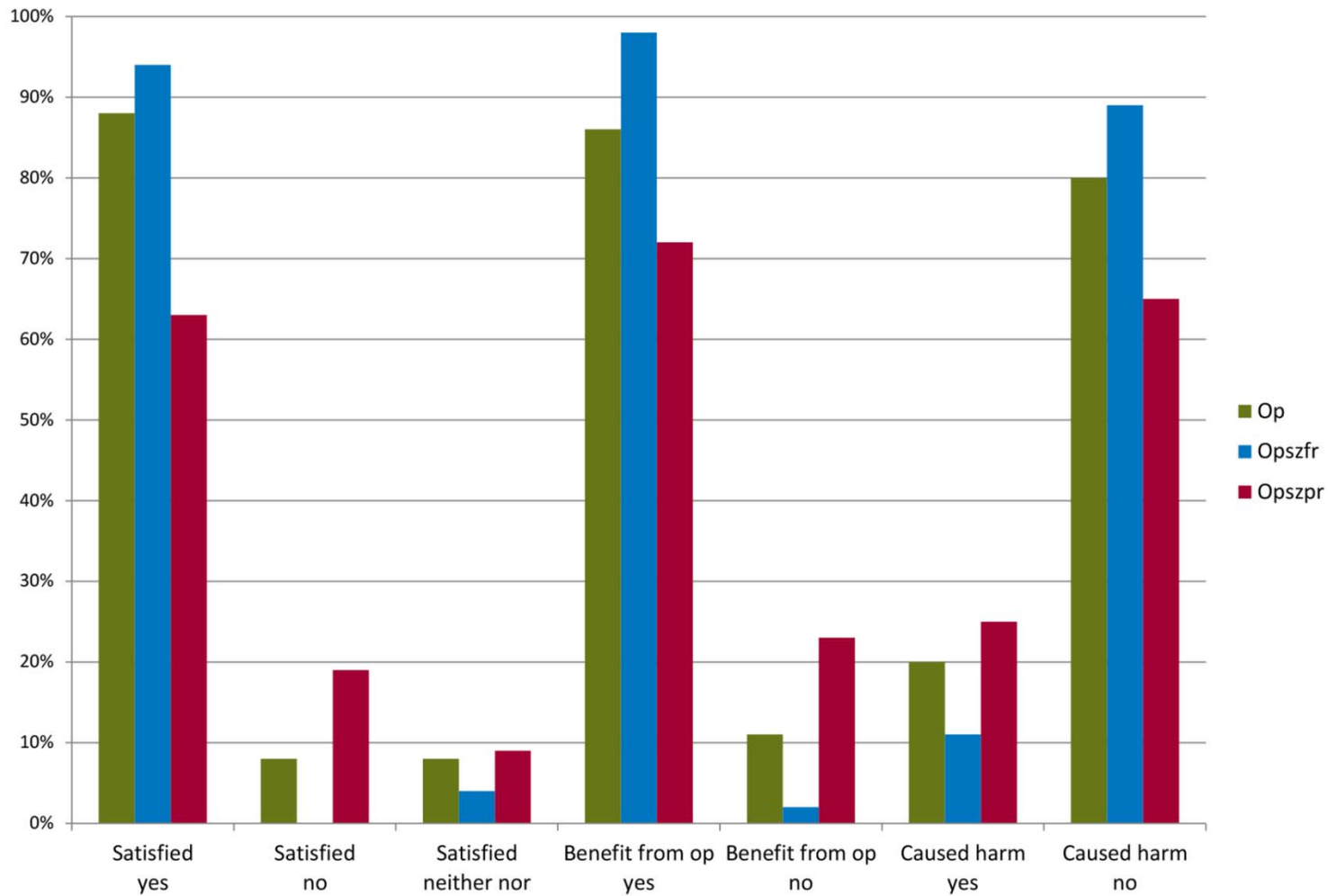
Taft et al Epilepsia 2014

- Figure 1. Effect sizes for SF-36 and HAD between baseline and follow-up.



MCS: mental component summary of SF-36, PCS: physical component summary of SF-36, the eight SF-36 subscales. Opszfr: operated seizure-free, Nonop: nonoperated, Opszpr: operated seizure persistent

Satisfaction with epilepsy surgery



Taft et al Epilepsia 2014

Sammanfattningsvis:

- Ca 50 % får en bestående anfallsfrihet efter kirurgi
- Bäst resultat för de som har en lesion (70-80%)
- Störst risk för anfallsrecidiv under de första 5 åren, men risken blir aldrig noll
- Av anfallsfria vuxna har ca 40% slutat med AED efter 10 år
- Arbetsförmågan är kopplad till anfallsoutcome, men viktigast är om man haft ett arbete före op

Sammanfattning forts.

- Livskvaliteten förbättras för dem som uppnår anfallsfrihet
- Majoriteten är nöjda med att ha genomgått epilepsikirurgi, även om anfallsfrihet inte uppnåtts

- **Tack till samtliga epilepsikirurgiska centra i Sverige**
- Vårt samarbete leder till ökad kunskap och nytta för våra patienter!

