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Surgical Treatment of Epilepsy in Adult: Systematic Literature Review

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Abstract

This review is aiming to discuss the surgical treatment of epilepsy in adult, the presented review was conducted by searching in Medline, Embase, Web of Science, Science Direct, BMJ journal and Google Scholar for, researches, review articles and reports, published over the past years. were searched up to November 2018 for published and unpublished studies and without language restrictions, if several studies had similar findings, we randomly selected one or two to avoid repetitive results. On the basis of findings and results this review found Lesionectomy, mesial temporal resection, temporal and extra temporal surgeries, corpus callosotomy, anterior temporal lobectomy.

Keywords: *Surgical; Treatment; Epilepsy; Adult*

Introduction

One of the most common health problems these days is epilepsy. Its active prevalence rate during the past five years is estimated at 0.6% among the general population and its prevalence rate may reach 1.3% [1]. Sometimes doctors resort to surgery if medical treatment fails. With conservative characters, over 100,000 people in the U.S. may qualify for epilepsy surgery [2]. The reason for the emergence of surgically treatable seizures is due to the temporal lobe, and the process that is often performed to treat epilepsy is the removal of the temporal lobe [2]. To cancel seizures or reduce their frequency significantly in most patients with efficacy this procedure has been reported on the basis of short and long-term studies [2,3].

The success of epilepsy surgery depends directly on the ability to localize, eradicate or separate the epileptic cortex specifically. The localization process [4] requires and expert interpretation [5] to identify respectable lesions such as MSS, fibrous tissue, cortical development abnormalities, tumors and other restricted anomalies and also requires good imaging studies, for example, magnetic resonance

imaging (MRI) [6]. There are 20 - 30% of patients with temporal epilepsy and 20 - 40% of those with additional temporal epilepsy have an unclear lesion on MRI despite the advances in functional and structural magnetic resonance imaging that allows the identification of subtle lesions [7-9]. This is important because cohort studies of predictors of surgical outcome often report better out comes in patients with demonstrated MRI lesions than in those without relevant MRI abnormalities. For example [10] found that in patients with temporal lobe epilepsy surgery, 62 - 80% of those with a lesion identified on MRI became seizure-free, compared with 36% of the non-lesional (NL) patients. Other studies including temporal and extra temporal epilepsy surgery have reported similar findings [11-14].

Corpus callosotomy is a palliative surgical procedure for patients with intractable generalized seizures who are not amenable to focal resection [15]. There is palliative surgery for patients with generalized, fanatical and non-excision focal cases of sinus fracture [15].

The surgical outcome in Asian epilepsy is variable and good results range from 39 to 83% [16].

Methods

This review was conducted in November 2018 in accordance with the preferred reporting lines for systematic reviews and metrics for the Meta-Analysis Declaration (PRISMA) for a systematic review. All the topics on surgical treatment of epilepsy in adult were reviewed. such as Lesionectomy, mesial temporal resection, temporal and extra temporal surgeries, corpus callosotomy, anterior temporal lobectomy. In order to achieve this goal, Medline, Embase, Web of Science, Science Direct and Google Scholar have searched for articles, articles, and reports published over the past fifteen years.

This research was completed without language restrictions and data were extracted for the year of study and study design and the main results of diabetes. Selected studies were summarized and unproductive studies were excluded. The data specified is shown in table 1.

Author and year	Sample	Surgical treatment	Key point
L.M.L. 1999 [18]	38 adults	Lesionectomy, mesial temporal resection	Our findings indicate that in patients with dual pathology removal of both the lesion and the atrophic hippocampus is the best surgical approach and should be considered whenever possible.
Jose F 2010 [19]	40 articles	Temporal and extra temporal surgeries	It is important to point out that nearly half of these patients achieved seizure freedom with surgery
Taketoshi M 2008 [20]	59 patients	Corpus callosotomy	In the present study, we found that total callosotomy is more effective for treatment of drop attacks than partial callosotomy and that children receive more benefit than adults after callosotomy.
Michael R 1996 [21]	Eighty-nine patients	Anterior temporal lobectomy	Temporal lobectomy provides sustained seizure relief over 5 years to most patients who have surgery. Outcome at 2 years predicts long-term outcome. A seizure-free state is associated with reduced mortality and increased employment. Mere reduction in seizure frequency is not associated with improvement in those measures.

Table 1: *Results from sequencing studies.*

Inclusion criteria

Inclusion criteria were treatment of epilepsy surgical, adult.

Exclusion criteria

Irrelevant articles not related to the aim of this review and articles that did not meet the inclusion criteria in this review.

Data extraction and analysis

Information relating to each of the systematic review question elements was extracted from the studies and collated in qualitative tables. Direct analysis of the studies of surgical treatment of epilepsy in adult.

Results and Discussion

Freedom from seizures was achieved in 11/15 (73%) of the patients who had a lesion removal plus temporary male eradication compared to 2/10 (20%) 2/16 (12.5%) those who had lesion removal alone. When the first and second categories were studied together, the percentages increased to 86, 30 and 31%, respectively [17].

The literature search yielded 1914 citations, of which 132 (7%) were potentially eligible and were examined in full text independently by two reviewers. 92 (70%) were excluded from these articles and 40 (30%) were included in the meta-analysis. Out of 40 articles included 28 studies on 35 studies describing surgical outcomes for temporal and temporal surgeries, 17 studies on 20 studies for temporal lobe epilepsy surgery, and 12 articles in 13 studies of extracurricular epilepsy surgery. Also, the visual analysis of forest lands revealed no significant clinical heterogeneity; the point estimate for all studies except two studies was in the same direction. The Q statistic for all meta-analysis did not reveal a statistically significant heterogeneity (p-values ranged from 0.12 to 0.59). Accordingly, we performed the corresponding meta-analysis [18]. Satisfactory results were achieved in 85% of patients with seizures, 32% of generalized seizures, and 31% of seizures. Families assessed total daily function as having improved in 62% of patients, did not change in 23%, and weakened in 15%.

Family satisfaction was identified by a few vulnerabilities in 83% of patients. Total renal piercing is an independent prediction of a satisfactory decrease in falls attacks ($p = 0.013$). A younger age independently predicted improved overall daily function (weak and improved: $p = 0.004$) and family satisfaction (somewhat dissatisfied and satisfied, $p = 0.018$; certainly dissatisfied and satisfied, $p = 0.0006$) [19].

Five years after surgery, 62 patients (70%) were seizure free, 8 (9%) had seizures on fewer than 3 days per year or exclusively had nocturnal seizures, 10 (11%) had greater than 80% reduction in seizure frequency, 5 (6%) had less than 80% reduction in seizure frequency and 4 (4%) died of causes unrelated to surgery. The proportion of patients in each outcome class remained stable throughout the 5-year period. Fifty-five percent of seizure recurrences happened within 6 months of surgery, and 93% occurred within 2 years after surgery. Outcome at 1 year related only moderately well to outcome at 5 years. No significant cognitive or linguistic deficits occurred. All patients who died had persistent seizures after surgery. Underemployment and unemployment declined significantly after surgery, with improvement noted in seizure-free patients [20].

One would like to ideally conduct a prospective randomized study of the three types of surgeries. It assesses the outcome of what would be an "optimal" individual procedure in light of current knowledge and technology for Nubia localization from five centers (in Canada, the USA, the UK, and Australia). Cascino., *et al*. (1993*b*) reported three patients with dual pathology who had an unsuccessful outcome after lesionectomy (two vascular malformations and one ganglioglioma); they achieved freedom from seizures following a second operation in which the atrophic hippocampus was resected in this series, the best results were seen in these patients who removed both the lesion and the hippocampus. 73% of them are completely free of seizures, compared to 20% of those who re-erected the atrophic hippocampus alone and 12.5% of those who underwent eradication of the lesion only. The best results were 86%, when both the first and second rows were included These results are similar to those obtained in MTS (90% in the first and second class) (Arruda., *et al*. 1996) or in the epilepsy syndrome (85% in the first and second category) [17].

In 1956 Penfield postulated that the presence of a specific lesion on histopathology usually augured a favorable postsurgical outcome (Penfield, 1956). Later, Bengzon., *et al*. (1968) noted that in the Mont real experience, a high proportion of patients with lesions had favourable epilepsy surgery outcomes. However, over the years, surgical outcomes in series of patients with NL have varied (Alarcon., *et al*.

2006; Carne., *et al*. 2004). This review provides a methodological and meta-analysis of the best available evidence quantitative summary estimates of seizure outcomes in different groups of LE and NL patients. Main analyzes were performed and all results were consistent. The chances of freedom from seizures one year after epilepsy surgery were higher 2.5 - 2.8 in patients with a lesion identified by MRI or pathological anatomy. This translates into a risk ratio of 1.4, which means that patients with a "LE" epilepsy are 40% more likely to have epileptic seizures after epilepsy surgery than those without specific lesions ($p < 0.001$) [18].

For the current series of sinusotomy, preoperative factors independently associated with the outcome of the seizure were analyzed by multivariate analysis. The results indicated that total endocrine administration is much more effective in achieving a disease reduction in falls episodes than partial rupture. Disease decrease in seizures was obtained in 94% of patients with total department and 65% of patients with partial division. However, preoperative factors, including age at surgery, severe mental retardation, and side effects in EEG, MRI, or clinical examination, were not significantly associated with the satisfactory reduction of falls episodes [19].

This study demonstrates that anterior temporal lobectomy provides sustained seizure relief or significant reduction in seizure frequency for 5 years to most patients without significant neuropsychological impairment. The majority of seizure recurrences occur in the first 2 years after surgery, and outcome at 2 years reasonably predicts outcome at 5 years. Postoperative auras, in the absence of seizures, are benign and do not increase the risk of seizure recurrence. To benefit in the collateral measures of employment and mortality, seizure elimination is required; even a substantial reduction in seizure frequency conferred no benefit in those measures [20].

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