

Case Report

Lesionectomy for Temporal Lobe Lesion can Result in Reduced Need of Antiepileptic Drugs

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BACKGROUND: Seizure outcomes after lesionectomy have been proven to be equivalent to excision, which ablates the epileptogenic cortex with the lesion. Different forms of resection surgery, as well as temporal lobectomy, are being investigated as therapeutic options for people with focal epilepsy who have not responded to medication. Although seizure control is the primary goal of epilepsy surgery, lowering or quitting antiepileptic drugs (AEDs) following epilepsy surgery is also an essential goal for patients and epileptologists.

CASE PRESENTATION: We described a thirteen-year-old female who had suffered from headaches and multiple bouts of complex partial seizures for three years before undergoing surgery for a well-circumscribed lesion occupying the medial portion of the left temporal lobe next to the pole, with modest compression of the ipsilateral crus of the midbrain. Following surgery, the patient was kept on levetiracetam and phenytoin, which was later converted to a single antiepileptic drug with complete seizure control.

CONCLUSION: Patients on multiple antiepileptic drugs for control of temporal lobe lesional seizures can be kept on a single antiepileptic drug after resection of the lesion and slowly the dose can be reduced.

KEYWORDS: Antiepileptic drugs, Epilepsy, Lesionectomy, Temporal lobe.

INTRODUCTION

The primary goal of epilepsy surgery is seizure control. Furthermore, careful tapering and eventual discontinuation of antiepileptic drugs (AEDs) after epilepsy surgery is a necessity for patients and a goal of epileptologists. However, there are no recommendations for stopping AEDs after epilepsy surgery. According to several researches, antiepileptic drugs withdrawal is more likely to be successful if the patient is seizure-free for at least a year after surgery.¹ Temporal lobectomy and other types of resection surgery are used to treat medically resistant epilepsies on occasion. The median seizure-free rate after temporal lobectomy is around 70%, although it is lower with extra-temporal lesion resections and non-lesional epilepsy.² In addition, epilepsy induced by an intracranial lesion is treated by removing the lesion and combining it with AEDs.³ The shift from polytherapy to monotherapy, which is common following epilepsy surgery, is associated with a decrease in drug-related side effects.⁴ A Cochrane review of 149 children published in 2006 revealed seizure recurrence at variable time intervals up to 5 years after AEDs discontinuation. Tapering of AEDs was performed

over a period of 6 weeks in one group and over a period of 9 months in the other group, with no significant difference between both groups as regards the rate of seizure recurrence.^{5,6}

We present a case of a thirteen-year-old female with headaches and complex partial seizures who had surgery for a lesion in the left temporal lobe, with successful reduction of antiepileptic drugs after surgery and complete seizure control.

CASE PRESENTATION

A thirteen-year-old female patient reported headaches and repeated instances of complex partial seizures over three years. On neurological examination, she had hallucinations in the form of déjà vu and jamais vu as temporal lobe symptoms, but no language, memory, or visual impairments. Preoperative contrast-enhanced magnetic resonance imaging (MRI) of the brain revealed a hypointense, non-enhancing, well-circumscribed lesion in the medial part of the left temporal lobe adjacent to the pole, with mild compression of the ipsilateral crus of the midbrain. The lesion became hyperintense with intralesional multiple septations on T2 weighted images, with no restriction of diffusion, and no perilesional edema (**Fig. 1**). Her seizures were controlled with a combination of antiepileptic drugs; levetiracetam 500mg twice daily and phenytoin 100mg twice daily.

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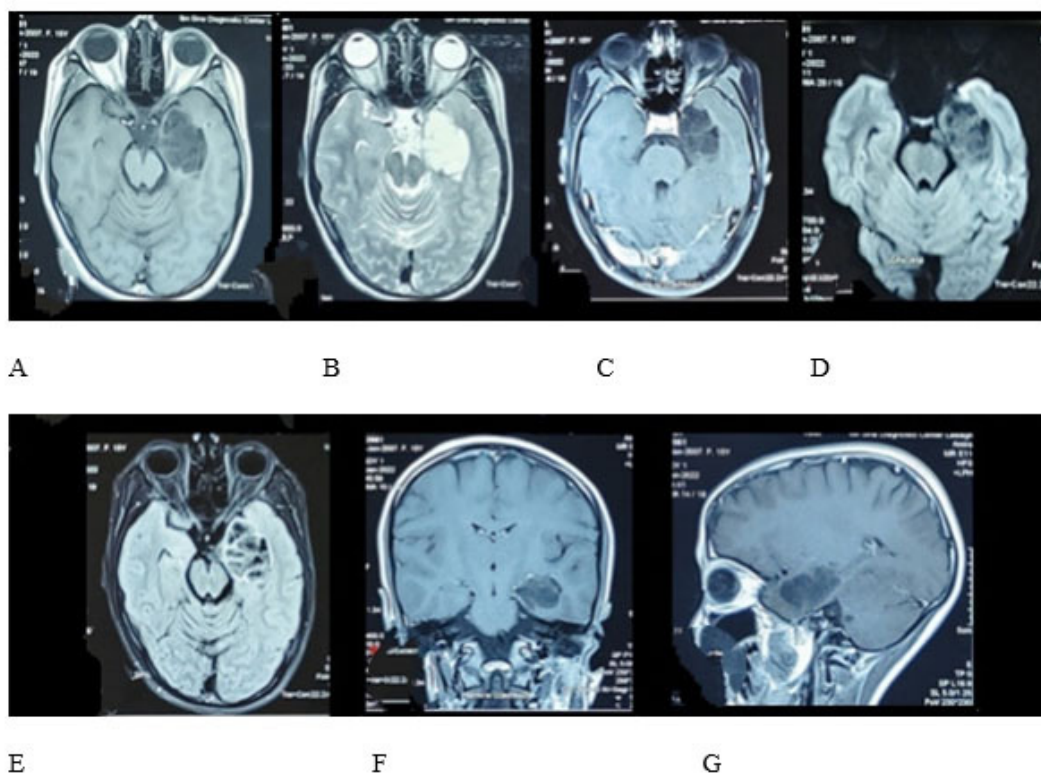


Fig 1: A) MRI axial T1 weighted image showing hypointense well circumscribed lesion occupying the medial part of left temporal lobe adjacent to the pole with mild compression of the ipsilateral crus of mid brain. (B) Axial T2 weighted image showing hyperintense lesion with intralesional multiple septations. (C) Axial contrast-enhanced T1 weighted image showing no enhancement of the lesion. (D) Axial diffusion weighted image showing no restriction of diffusion. (E) Axial fluid attenuated inversion recovery (FLAIR) image showing no perilesional edema. (F) Coronal contrast-enhanced T1 weighted image showing no enhancement of the lesion. (G) Sagittal contrast-enhanced T1 weighted image showing no enhancement of the lesion.

The institution has approved the study and patient's guardian was consented for publication. It was decided to perform lesionectomy to reduce the need for drugs and the cost load. From the condylar line posteriorly along the superior temporal line up to the anterior end, a question mark incision was created beneath the root of the zygoma. Subtemporal temporal lobe retraction was possible thanks to hypotensive anesthesia and gravitational retraction. A piece of the tumor was visible on the inferior temporal gyrus, which was pierced, and intratumoral debulking was performed by bipolar cautery and suction. The tumor was gray, squishy, suckable and vascular. Leaving the height component in situ allowed for nearly complete removal. Dura was coiled in layers and was closed watertight.

A contrast-enhanced postoperative computerized tomography (CT) of the brain revealed a residual tumor with minimal pneumocephalus and no tumor bed hematoma. No complications were noted after surgery. The patient was given injectable levetiracetam 500mg twice daily and phenytoin 100mg twice daily until day 7, when she switched to oral version at the same dose and frequency. The patient was discharged from the hospital

with the same medications. We checked in with the patient after the first, third, fifth, and sixth months, and reduced AEDs from dual to monotherapy after the fifth month. No seizure was observed even after sixth months. Her electroencephalography (EEG) was done after that and it showed normal findings. We followed the patient for one year and found that she was completely seizure free with a single antiepileptic drug (levetiracetam).

DISCUSSION

The primary objective of epilepsy surgery is to give the patient a life free of seizures. Another objective is to progressively lessen and finally stop using the AEDs. However, research on AEDs cessation is limited. Andermann et al. advocated making no modifications for "an arbitrary period of one year" and considering AEDs discontinuation after two or three years.⁷ Following epilepsy surgery, the doctor usually switches from polytherapy to monotherapy, which reduces the drug-related side effects.^{4,8} However, another study suggests that the total drug load may be more important than the number of AEDs as regards toxicity.⁹

In the limited trials that describe antiepileptic drug

regimens following epilepsy surgery, there appears to be a trend to shift from polytherapy to monotherapy over time. Wieser studied 52 patients who had at least 6 months follow-up after amygdalo-hippocampectomy and discovered that 52% of the patients were still on polytherapy, 27% were on monotherapy, and 21% were not taking any antiepileptic medications.¹⁰ In another study, McLachlan and Maher conducted a retrospective examination of 93 temporal lobectomy patients who were followed at 6, 12, and 24 months after surgery. The patients with polytherapy were reduced from 78% before surgery to 14% after two years, while patients with monotherapy increased were increased from 20% to 42%, and medications were discontinued in 44% of the patients. They observed that moving from polytherapy to monotherapy within six months of surgery had no effect on seizures. They mentioned that if monotherapy was not achieved at the time of discharge, a gradual decrease in medication might begin six months later. If monotherapy was used before surgery, either no changes was made or, in rare cases, a slight dosage decrease might begin five or six days after surgery and prior to hospital discharge.¹¹ Patients on monotherapy, who have been seizure-free for one or, preferably, two years can be offered the choice to quit medication using recognized guidelines for drug withdrawal following medical treatment.^{6,11,12}

CONCLUSION

Patients on multiple antiepileptic drugs for control of temporal lobe lesional seizures can be kept on a single antiepileptic drug after resection of the lesion. Furthermore, the dose of the single antiepileptic drug can be slowly reduced gradually over time. Thus, surgery can eventually reduce the load of antiepileptic drugs.

List of Abbreviations:

AEDs: Antiepileptic drugs.
 CT: Computerized tomography.
 EEG: Electroencephalography.
 FLAIR: Fluid attenuated inversion recovery.
 MRI: Magnetic resonance imaging.

Disclosure

The authors report no conflict of interest in the materials or methods used in this study or the findings specified in this paper.

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