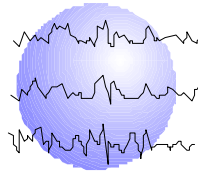


HOW MANY PALLIATIVE SURGICAL PROCEDURES FOR INTRACTABLE EPILEPSY?

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ABSTRACT

RATIONALE

Rarely are seizures completely controlled by either corpus callosotomy (CC) or vagal nerve stimulation (VNS). If a patient has had one of these procedures, helpful or not, will the other procedure be of benefit? We reviewed our experience with patients who had had both procedures to answer the following questions: Were seizures decreased by either palliative procedure or by both? Were the number of antiepileptic medications (AEMs) taken by the patient decreased after either procedure? To which therapeutic intervention was seizure frequency reduction attributed? Was there a subjective improvement in the patient's quality of life (QOL)?

METHODS

Records of surgical patients were searched to find those who had both CC and VNS. The medical records were reviewed for demographics, seizure type/s, medication/s, and seizure frequency before and after surgeries. A seizure frequency decrease of 80% or more was considered a positive outcome following CC. A decrease of seizures of 50% or more following VNS was considered positive.

RESULTS

20 patients (13 male/7 female) had both CC & VNS surgeries. 18/20 (90%) had Lennox-Gastaut syndrome (LGS) with multiple seizure types & 2 had partial secondarily generalized seizures. Prior to their last surgery they had failed an average 11 AEMs & 50% had failed the ketogenic diet. 14/20 (70%) had a partial (4) or complete (10) CC prior to VNS. 7/14 had a positive response to CC prior to VNS. In 6/14 (42%) the VNS reduced seizures by >50%. 4/6 VNS responders had a positive response to previous CC, 2 did not. Following the VNS, 4 patients had an increase in the number of AEMs, 1 decrease & 9 unchanged. 6/20 (30%) had VNS prior to CC. All had LGS & none had a positive response to VNS. All 6 had a positive response to CC, 2 partial CC, 4 complete CC, and 3 had number of AEMs increased, 2 decreased & 1 no change. 14/20 patients (or parents/care giver) reported an improvement in QOL after the second surgical procedure. In 2 patients the improvement in seizure control and QOL was attributed solely to a change in AEMs. The rest attributed these improvements to both surgeries or the most recent procedure.

CONCLUSION

In this refractory group of patients, 90% with LGS, over 50% appeared to benefit from a second palliative surgical procedure. Only rarely were AEMs reduced, but a subjective improvement was noted in QOL.

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INTRODUCTION

Corpus callosotomy and vagal nerve stimulation are palliative surgeries for patients with pharmaco-resistant epilepsy. Although seizure freedom is ideal, there are patients for whom this is an unrealistic expectation. Many of these patients have frequent and/or severe seizures that disrupt their lives and may cause injury. These patients are considered for palliative surgical procedures because they would benefit from a reduction in seizure frequency/severity. Whether the palliative surgical procedure is beneficial or not, some of these patients continue to have seizures that disrupt their lives and/or cause injury. It is in this subset of patients that we have performed both palliative surgeries. This is a review of the outcomes following the surgeries to determine if the second palliative surgical procedure resulted in a decrease in seizure frequency or severity, decreased the number of antiepileptic medications taken, or subjectively improved quality of life. If there was an improvement in seizures or quality of life, we tried to determine if it was attributed to the surgical procedure.

METHODS

Files of all patients who had surgery were reviewed to find those who had both a corpus callosotomy and a vagal nerve stimulator. Patients with less than 12 months follow-up were excluded. The records were reviewed for the following: demographics, prior and current antiepileptic medications, other treatments, age at surgeries, seizure and epilepsy syndrome, seizure frequency, results of surgery, length of follow-up, subjective evaluation of patients (parent/caregiver) quality of life. We defined a positive outcome for vagal nerve stimulator (VNS) as a 50% or greater decrease in the seizure type targeted. A positive outcome for corpus callosotomy (CC) was an 80% or greater decrease in seizure frequency and a decrease in seizure severity of the seizure type targeted. Improvement was attributed to medication if there had been no improvement for 1 year following surgery and within the titration period of an additional medication there was a greater than 50% improvement in seizure control, and that improvement was sustained for at least 6 months.

RESULTS

20 patients met inclusion criteria, 13 males, 7 females. Ninety percent, 18/20, had Lennox-Gastaut Syndrome, with multiple seizure types. Two had multifocal partial and secondarily generalize seizures. The patients had been treated with a median of 11 previous antiepileptic medications, 50% had an unsuccessful trial of the ketogenic diet. They were taking an average of 3.5 antiepileptic medications. Seventy percent 14/20, had corpus callosotomy(10 complete, 4 partial) prior to VNS, and 30%, 6/20, had VNS prior to CC(4 complete, 2 partial anterior).

Group 1: Corpus Callosotomy before VNS

6 (42%) Responders, 2/6 had an increase in medication, none had a decrease. All responders reported an improved quality of life, 3 non-responders also reported an improvement in QOL. 5/6 attributed the improvements to effects of VNS, 1 to medication (LEV) change. 4/6 reported a previous benefit from corpus callosotomy as well. The mean follow-up was 45 months (13-75), mean age at cc 10 years, at VNS 16 years, and mean time between surgical procedures 6.3 years. Two patients did not tolerate the VNS, 1 had problems with swallowing and pain even at the very lowest settings possible, and the other repeatedly had an increase in seizures each time the VNS was initiated.

Group 2: VNS before Corpus Callosotomy

All responded, 4/6 were complete 2 anterior partial CC. 3/6 had an increase in medication, 2 decrease, 1 the same. 5/6 responders reported an improvement in quality of life. 5/6 attributed the improvements to CC, 1 to medication (FBM). The mean follow-up is 26 months (15-36), mean age at VNS 12 years, at CC 15 years, mean time between surgeries was 2.8 years.

CONCLUSIONS

Half of the patients attributed an improvement in seizure control, and a subjective improvement in quality of life to a second palliative surgical procedure. Four patients reported an improved quality of life after surgery, 2 attributed it to medication changes, 2 had VNS but no significant change in seizure control. The number of antiepileptic medications being taken was increased in 7 patients, decreased in 3, and remained the same in 10 (50%). Although the subjective improvements in quality of life may have been related to a decrease in atypical absence seizures, we were unable to quantify accurately the frequency of this seizure type in the Lennox-Gastaut patients. These results are similar to those reported by Frost, Gates, Helmers et al (2001) in children with Lennox-Gastaut Syndrome treated with the VNS. Helmers, Wheless, Frost, et al (2001) also reported a 43% decrease in seizures at 12 months for 12 patients who were treated with VNS following CC. The success rate of CC following VNS in these patients is exceptionally high, and most likely due to the small numbers.

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