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Combined Occipital Nerve/Supraorbital Nerve Stimulation for Treatment of Refractory Headaches: Initial Adolescent Experience (Ages 12-17)

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Objectives: Assessment of the efficacy and safety of dual occipital-supraorbital nerve stimulation in adolescents for the treatment of intractable headaches.

Background: Adolescents' ages 12-17 including 10 females and 3 males were screened for implantation of occipital-supraorbital nerve stimulators. All patients had severe disabling chronic headaches had failed standard headache therapies including courses of dyhydroergotamine 45. Neurological examinations were normal, but comprehensive headache examinations were abnormal.

Methods: Trial stimulators were placed using C-arm fluoroscopy in Quatrode (St. Jude) with 4 lead wires placed across the area of the occipital and supraorbital nerves. The trial period lasted 3-5 days. Criterion for a positive response was a 75% improvement from baseline. Responders had an implantable pulse generator (IPG) placed in the gluteal region. Fully implanted the IPG is capable of responding to an external programming computer. Patients were followed post operatively by both the implanter and the child neurologist. Comprehensive headache examinations were repeated and compared to baseline.

Results: Two patients failed the initial trial. The remaining 11 patients had implantation. Nine of the 11 implanted have continued to have good clinical response. Two patients who had good response initially later became non-responsive.

In early trial period one subject had occipital implantation alone while a second patient had implantation of the supraorbital nerve alone. Both of these patients required re-implantation with dual stimulators and are doing well. Additionally, two patients required additional electrodes in the frontal regions to obtain optimal clinical response.

Sixty percent of the patients remain headache free. While 20% continue to have some headaches but overall have shown a 50% improvement. Fifty pervent of patients were able to totally discontinue their medications while the remaining patients have decreased their need for medications by 50%. All of these patients have returned to school. Prior to the implantation all had been on a modified school program.

Follow-up comprehensive headache examination was normal in all patients who were headache free and improved in the remaining patients but had some abnormalies in the occipital region.

Conclusions: Combination occipital-supraorbital nerve neurostimulation provides an effective alternative treatment for adolescent patients with chronic severe headaches. Comprehensive headache examination can be helpful for following these patients.