

Update of Seven Cases of Refractory Cluster Headache Treated with Combined Occipital Nerve and Sphenopalatine Ganglion Stimulation with Good Mean Outcome in a Long Term Follow Up

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Abstract

Introduction: Cluster headache (CH) is an extremely debilitating and often difficult-to-treat headache disorder characterized by recurrent attacks of excruciating pain associated with cranial autonomic symptoms. Several invasive neuromodulation procedures have been evaluated in the past, but the combination of these procedures to maximize response has not been studied in groups of patients. This presentation aims to describe an update on the evolution of cases based on a recent publication of ours.

Clinical description: This single-center, retrospective, observational study included seven patients (3F/4M) suffering from CCH, according to the diagnostic criteria of the current International Classification of Headache Disorders,¹ and considered refractory based on the Consensus Statement of the European Headache Federation Between February 2010 and March 2021, these patients underwent implantation of electrodes for SPG and greater occipital nerve (GON) stimulation ipsilateral to the side of the pain (Figure 1). Patients with uncontrolled hypertension, cerebrovascular disease, congestive heart failure, cancer, or severe psychiatric disorders were considered ineligible for the procedure. The electrodes were implanted in a single surgery under general anesthesia. The mean follow-up time was 6.38 years \pm 3,6 (maximum 12.6

years and minimum 1.3 years). Six out of the seven patients (86%) experienced good-to-excellent initial pain relief, defined as a equal or greater 50% reduction in VAS scores compared to baseline, together with marked clinical improvement in attack severity and functional impact as assessed by the treating physicians. Almost complete remission of symptoms was achieved in most cases, defined as the complete absence of cluster attacks or only rare, very mild episodes without significant functional impact.

Discussion: Multiple techniques have been proposed to control CH symptoms, including ablative techniques as radiofrequency on the Gasser ganglion, SPG and GON.^(7, 8) Peripheral Nerve Stimulation has been tried on SPG or GON, both isolately, Vagal Stimulation and High cervical Stimulation, with success, in reduced samples. Hypothalamic Deep Brain Stimulation was successfully tried, with low but significant morbi-mortality.^(9, 10, 11) Here we report, for the first time, that combined invasive SPG and GON neurostimulation significantly and enduringly improves CCH symptoms in a series of refractory patients. Moreover, the number and severity of complications presented indicate that this approach is relatively safe compared to others of its kind, resulting in a convenient risk-benefit profile.

Conclusions: Synergistic invasive SPG-GON stimulation appears to be a relatively safe and promising alternative for effective and long-lasting control of CCH.



Figure 1. Patients underwent implantation of electrodes for SPG and greater occipital nerve (GON) stimulation ipsilateral to the side of the pain.

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