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Occipital nerve stimulation for chronic cluster headache

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Cluster headache is a trigeminal autonomic cephalgia characterized by very severe orbital – temporal pain (VI distribution) and cranial autonomic features. Anesthetic blockade of the greater occipital nerve (GON) may provide temporary relief of cluster headache. In view of the functional anatomic continuum between the trigeminal nucleus caudalis and the upper cervical nerve roots involved in cranial nociception, occipital nerve stimulation of the GON has the potential to provide sustained relief of cluster headache.

A 45 year-old male presented with an 18-month history of chronic cluster headache (CCH). He experiences 3-4 attacks per day each lasting about 1 hour, although some attacks may last up to 4 hours. The patient had a preceding history of episodic cluster headache for approximately 25 years with cluster periods usually lasting 8 weeks. The vast majority of attacks occur on the right side (90%). The pain is confined to the retro-orbital and occipital region. Premonitory symptoms consist of burning pain in the right occiput and a bursting sensation behind the right eye. Each attack is associated with motor agitation, rectal urgency, bilateral lacrimation, ipsilateral nasal congestion, rhinorrhea, periorbital edema and ptosis. Nausea and emesis may occur. Although oxygen, parenteral sumatriptan and dihydroergotomine (DHE-45) were once effective, since developing CCH, he has failed to respond to these and other medications including methysergide, lithium, verapamil, gabapentin, topiramate, melatonin, nadolol, amitriptyline, celecoxib, indomethacin, paroxetine, prednisone, olanzepine, oxycodone 20 mg/day, butorphanol, and repetitive IV infusions of DHE-45 and methylprednisolone. At presentation, despite the use of 4 prophylactic medications for cluster headache and chronic opioid therapy, the patient suffered 3-4 attacks per day.

The patient became pain free for 3 days after occipital nerve blockade with 10 cc 0.5% bupivacaine and 10 mg methylprednisolone. As a trial, the patient underwent temporary placement of a subcutaneous Medtronic Pisces Quad Plus lead in the region of the right occipital nerve. He remained cluster free for two weeks except for one left-sided attack. The patient then underwent permanent placement of bilateral GON stimulation leads.

This is the first patient with chronic cluster headache, to our knowledge, to be treated with occipital nerve stimulation. Thus far (7 months since implantation), the patient has enjoyed improved control of his previously refractory cluster headaches. He continues to have some headaches but with lower frequency and intensity and with periods of time with complete freedom from attacks. He is currently well controlled with stimulation and monotherapy with divalproex sodium. Although currently an unlabeled use of this technology, occipital nerve stimulation may represent an effective treatment modality for chronic medically intractable cluster headache and offer a viable alternative to destructive neurolytic procedures and more invasive hypothalamic stimulation.

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