

Occipital Field Stimulator Implantation for Refractory Dysesthesias After Chiari Decompression



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- Discuss common features of Chiari patients both pre and post decompression
- Discuss current use of peripheral field stimulation as treatment option for symptoms involving head and neck pain
- Discuss possible future indications for peripheral field stimulation

Objectives

Symptoms related to increased intracranial pressure (ICP)

- Pressure headaches
 - Classic symptom
- Neck pain
- Unsteady gait
- Poor hand coordination
- Paresthesias in hands/feet
- Dizziness
- Dysphagia
- Vision or speech problems

Worsen with coughing, sneezing or straining

Tx: decompressive surgery

Symptoms interfere with daily functioning or those who are at risk of herniation

Chiari Malformation

- TL, 48 year old female
- Chief complaint
 - “Fire-ants biting her” in the neck and suboccipital region
- PMH
 - Chiari malformation type I with a syrinx measuring 9.5 mm
- PSH
 - Suboccipital craniotomy and C1 laminectomy with decompression



Our Patient

- Medication management
 - Cymbalta and Lyrica
- Catheter assisted C1 epidural steroid injection

Previously Failed Treatments

- Trigger points
 - Cervical paraspinous and trapezius muscles
- Ultrasound-guided GON/LON nerve blocks
- Cryoneurolysis of the GON/LON
- Diagnostic field block around the scar
- Cryoablation of the scar

Occipital Neuralgia Treatment Algorithm

- Infiltration of the scar with local anesthetic
- Cryoneurolysis of bilateral GON/LON

Failed Treatments at Our Clinic

Peripheral Neurostimulation for Control of Intractable Occipital Neuralgia

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Table 1. Occipital Neuralgia Patient Database

| No | Pt | Age/Sex | Etiology | Implant | Device | F/U yrs | Prev procedures | Preop Sx | Outcome | Comments |
|----|----|---------|-------------|-------------------------------|------------------------------|---------|--------------------------------|----------------|------------------------|---------------------------------|
| 1 | JS | 72/M | Idiopathic | 4/92 12/92 7/93 3/96 | PQ/Itrell II | 4.0 | Blocks Alcohol Cryoprobe | 6 mo | Good | Revised Revised Explanted |
| 2 | NC | 61/F | C. Spond | 3/93 8/97 | PQ/Itrell II | 5.5 | Blocks Facet Blocks | Long-term | Excellent Excellent | Revised |
| 3 | MH | 60/F | Chi, AA | 11/94 11/95 | PQ/Itrell II PQ/Itrell II | 4.0 | Blocks | 2 yrs 2 yrs | Good Good | Right Left |
| 4 | DJ | 40/F | C Sten | 4/96 | PQ/Itrell II | 2.5 | Blocks | Long-term | Good | 5 volts req |
| 5 | BM | 55/M | CHI, AA | 5/96 | PQ/Itrell III | 2.5 | Blocks, Cryo | 6 mo | Excellent | |
| 6 | NL | 51/F | Ear Infect. | 7/96 | PQ/Itrell III | 2.5 | Blocks, Cryo | 6 mo | Excellent | |
| 7 | JT | 26/M | CHI | 3/97 | PQ/Itrell III | 1.5 | Blocks, Cryo | 2 yrs | Excellent | |
| 8 | WW | 54/M | Idiopathic | 4/97 | Dual Matrix | 1.5 | Blocks | 1 yr | Excellent | Bilateral |
| 9 | MA | 35/M | CHI | 5/97 | PQ/Itrell III | 1.5 | Blocks, Cryo | 4 yrs | Excellent | |
| 10 | JR | 44/F | C Sten, AA | 6/97 | PQ/Itrell III | 1.5 | Blocks | 1 yr | Excellent | |
| 11 | HH | 56/F | Idiopathic | 6/97 | Octrode/RF | 1.5 | Blocks | 5 yrs | Good | |
| 12 | WB | 55/F | TMJ | 6/97 | Octrode/RF | 1.5 | C2 Rhiz | 10 yrs | Excellent | |
| 13 | JC | 59/F | Idiopathic | 6/97 | Dual Octrode/RF | 1.5 | C2 Rhiz | 17 yrs | Good | |

CHI, closed head injury; AA, auto accident; C Sten, cervical stenosis; C Spond, cervical spondylosis; TMJ, temporomandibular joint syndrome; PQ, Pisces Quad

■ ABSTRACT

Objective. To present a novel approach for treatment of intractable occipital neuralgia using percutaneous peripheral nerve electrostimulation techniques.

Methods. Thirteen patients underwent 17 implant procedures for medically refractory occipital neuralgia. A subcutaneous electrode placed transversely at the level of C1 across the base of the occipital nerve trunk produced paresthesias and pain relief covering the regions of occipital nerve pain

Results. With follow-up ranging from 1-½ to 6 years, 12 patients continue to report good to excellent response with greater than 50% pain control and requiring little or no additional medications. The 13th patient (first in the series) was subsequently explanted following symptom resolution.

Conclusions. In patients with medically intractable occipital neuralgia, peripheral nerve electrostimulation subcutaneously at the level of C1 appears to be a reasonable alternative to more invasive surgical procedures following failure of more conservative therapies. ■

PERIPHERAL NEUROSTIMULATION FOR TREATMENT OF INTRACTABLE OCCIPITAL NEURALGIA

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OBJECTIVE: Medically intractable pain caused by occipital neuralgia (ON) can be very difficult to control with traditional pain management. Peripheral nerve stimulation (PNS) may serve as a good alternative to destructive surgical manipulations used currently for the treatment of severe ON.

METHODS: We analyzed records of 14 consecutive patients (9 women and 5 men; mean age, 43.3 yr) with intractable ON treated with PNS during the period from April 2002 to November 2004. Five patients had unilateral and nine had bilateral PNS electrodes inserted for trial, which was considered successful if patient reported at least 50% decrease of pain on the visual analogue scale. Ten patients proceeded with system internalization, and their long-term results were analyzed.

RESULTS: At the time of the last follow-up examination (5–32 mo, mean 22 mo), seven patients (70%) with implanted PNS systems continue to experience beneficial effects of stimulation, including adequate pain control, continuous employment, and decrease in oral pain medications intake. Two patients had their systems explanted because of loss of stimulation effect or significant improvement of pain, and one patient had part of his hardware removed because of infection.

CONCLUSION: Overall, the beneficial effect from chronic stimulation in our series persisted in more than half of the patients for whom procedure was considered and in 80% of those who significantly improved during the trial and proceeded with internalization. Thus, chronic PNS may be a safe and relatively effective method for long-term treatment of chronic pain syndrome in patients with medically intractable ON.

Occipital Nerve Stimulation for Refractory Headache in the Chiari Malformation Population

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BACKGROUND: Chronic occipital and suboccipital headache is a common symptom in patients with Chiari I malformation. These headaches may persist despite appropriate surgical treatment of the underlying pathology via suboccipital decompression, duraplasty, and cerebrospinal fluid diversion. Occipital nerve stimulation has been shown to be effective in the treatment of a variety of occipital headache/pain syndromes.

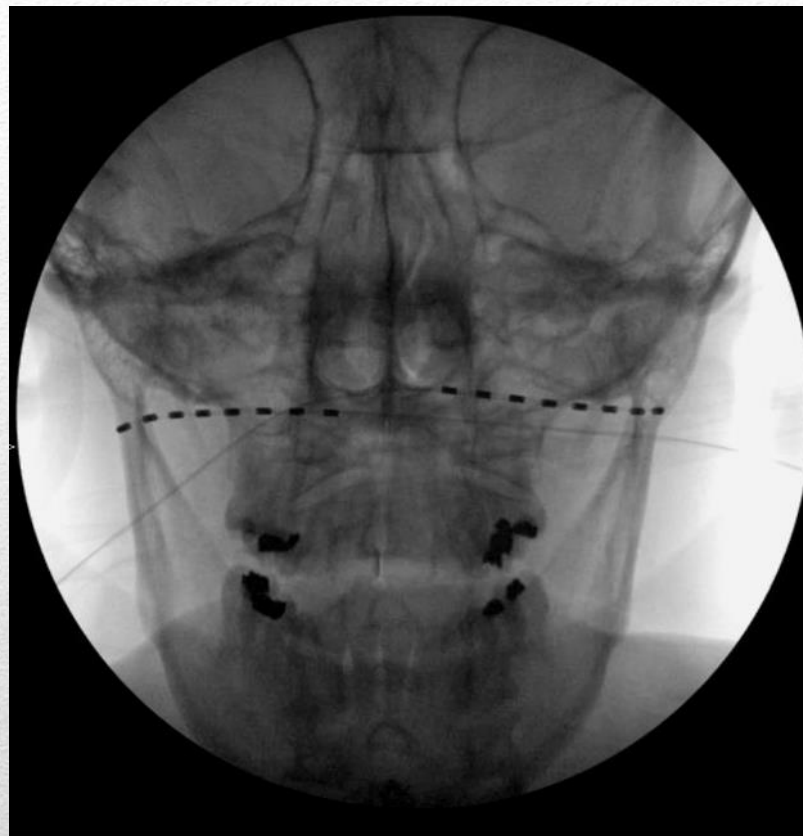
OBJECTIVE: To review retrospectively our experience with occipital nerve stimulation in patients with a primary diagnosis of Chiari malformation and a history of chronic occipital pain intractable to medical and surgical therapies.

METHODS: We present a retrospective analysis of our series of 22 patients with Chiari malformation and persistent occipital headaches who underwent occipital neurostimulator trials and, after successful trials, permanent stimulator placement. A trial was considered successful with > 50% pain relief as assessed with a standard Visual Analog Scale score. Patients with a successful trial underwent permanent placement approximately 1 to 2 weeks later. Patients were assessed postoperatively for pain relief via the Visual Analog Scale.

RESULTS: Sixty-eight percent of patients (15 of 22) had a successful stimulator trial and proceeded to permanent implantation. Of those implanted, 87% (13 of 15) reported continued pain relief at a mean follow-up of 18.9 months (range, 6-51 months). Device-related complications requiring additional surgeries occurred in 40% of patients.

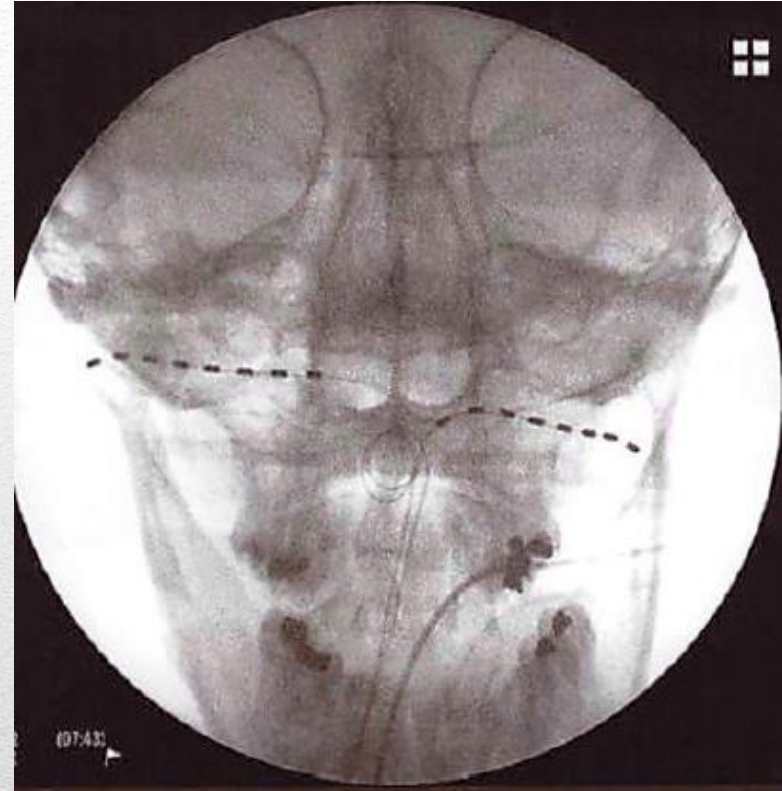
CONCLUSION: Occipital stimulation may provide significant long-term pain relief in selected Chiari I malformation patients with persistent occipital pain. Larger and longer-term studies are needed to further define appropriate patient selection criteria and to refine the surgical technique to minimize device-related complications.

- Two St. Jude Octrode electrodes inserted midline to lateral
 - Inferior to nuchal line within the sub-cutaneous tissue
 - Ultrasound and fluoroscopy guided
- 70-100% relief on the right and 50% relief on the left



Occipital Field Stimulation Trial

- Two St. Jude Octrode electrodes inserted midline to lateral
 - Inferior to nuchal line within the sub-cutaneous tissue
- Fluoroscopy guided
- Right lead at the same location as the trial and the left lead cephalad to the right
- 80-100% relief x 2 months
 - Reprogrammed in clinic



Permanent Implantation

Occipital field stimulation can be used to treat various ailments that may be refractory to less invasive treatments

- Occipital neuralgia
- Refractory headaches
 - s/p Chiari decompression
 - Migraines
- Suboccipital dysesthesias

Conclusion

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