

Combined Supraorbital (SONS) and occipital nerve stimulation(ONS) in Failed Surgical treatment of Migraine: Case Report and Review of the literature

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Background:Epidemiologic studies have shown that an estimated 35 million Americans suffer from migraine headaches. Economic consequences of migraine headache have been estimated to exceed \$13 billion per year. Recently, a series of publications have suggested that in certain patients migraine headaches can be surgically treated by decompressing peripheral nerves that acts as migraine triggers. However, such therapies are not always successful, and call into question what options remains for patients failing such surgical therapies.

Objectives: We detail a case of a patient who had failed surgical treatment for chronic migraine. Our objective was to see if combined SONS and ONS could result in improvement of the migraines despite neuro-destructive techniques applied to the peripheral nerves.

Methods:A 37 year old female patient suffering from migraines since age of 13 received an initial bilateral supraorbital nerve block and then surgical decompression of the proximal supratrochlear nerve. Following this, she also received blocks of the temporal tendon (bilateral). She had then a septal decompression surgery, which also did not relieve the headache. A bilateral decompression of the greater occipital nerves with partial resection of the semispinalis capitus muscle and placement of subcutaneous fat to shield the nerves, endoscopic decompression of the bilateral supratrochlear nerves with fat graft to cushion the nerves, bilateral release of the zygomaticotemporal branch of the trigeminal nerves, septoplasty, bilateral inferior turbinectomy and bilateral middle turbinate outfracture was then carried out to relieve her headaches. 3 months later, she underwent a bilateral supraorbital and supratrochlear neurectomy through a transplapebral approach. Unfortunately, all these 4 separate surgeries did not relieve her migraines. We then decided to proceed with an ONS and SONS trial to see if neuroaugmentation techniques could relieve her migraines.

Results: The patient had a highly successful trial with bilateral SONS and ONS stimulation. The frontal leads were placed approximately 3 cm above the eyelids in a higher position than normal to cover the pain in her vertex. She reported to have excellent pain relief, but did not feel any paresthesia coverage in her frontal leads. We conjectured that placing the leads in a more conventional position approximately 1.5 cm above the eyebrows would result in better coverage. A permanent implantation was performed with the information from the trial, and led to both better paresthesia coverage and headache relief. She continues to be headache free 5 months after her implant.

Conclusions:Reed et al have demonstrated that combined SONS and ONS stimulation leads to an improvement in outcome in migraine results. A moot issue is related to the success of the SONS and ONS in cases where surgical decompression has already been performed, and if indeed nerves regenerate, whether the regenerated nerves would be amenable to succesful neurostimulation paresthesia coverage. What we observed is very interesting in the sense that we achieved resolution of the frontal headaches WITHOUT paresthesia coverage in one of the frontal leads. As expected, output levels needed for relief of headache was higher than seen in normal patients, but successful resolution of migraine symptoms was obtained during the trial period. We hypothesize that the addition of SONS with ONS led to a better outcome to obtain the full therapeutic response, although further studies may be needed to indeed confirm the finding. The permanent implant was then able to replicate and even improve the results during

the trial period and has led to a successful outcome at 5 months follow-up. Thus, the case report emphasizes the importance of considering neuro-augmentation modalities versus neuro-destructive modalities, especially in cases of migraines resistant to multiple therapies.

References:

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