

## **SC108. Long -term effectiveness of combined unilateral Sphenopalatine and Occipital nerve stimulation in patients with refractory chronic cluster headache**

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### **Introduction**

Chronic Cluster Headache (CCH) is an extremely debilitating disorder characterized by recurrent attacks of excruciating pain associated with cranial autonomic symptoms. Contrary to its episodic form, there are no periods of remission in this condition, or they last very shortly. Treatment of Chronic Cluster Headache is always challenging. Several peripheral and central invasive neuromodulation techniques and ablative procedures have been attempted in the past with so far inconclusive results. Isolated Occipital Nerve (ON) stimulation has proven beneficial for CCH, but it can take up to several months before benefits are observed. Sphenopalatine (SPG) ganglion stimulation becomes effective in a shorter term and can be used both as preventive and as abortive on demand, yet results from previous studies overall suggest that there is still room for improvement. Of note, according to the literature, each of these two techniques has reached no more than level B of recommendation. Therefore, developing new strategies that provide rapid and sustained amelioration becomes crucial. In this study we present the results of a prolonged follow-up of refractory chronic cluster headache patients receiving combined invasive occipital and sphenopalatine ganglion neuromodulation.

### **Materials and methods**

Seven patients suffering from refractory CCH (3f / 4m), underwent implantation of electrodes for sphenopalatine ganglion (SPG) and greater occipital nerve (GON) stimulation ipsilateral to the side of the pain. Patients were evaluated preoperatively and then every three months after surgery. The visual analogue scale (VAS) and HIT-6 scale were used to monitor treatment response

### **Results**

Mean follow-up was  $8,13 \pm 1,9$  years at the moment of submission of this abstract. Six out of the seven patients (86%) experienced good-to-excellent initial pain relief, and achieved an almost complete remission of symptoms later on. One patient stopped requiring stimulation 15 months after the procedure and remained stable for up to 23

months when the device had to be restarted. Regarding HIT-6 results, mean values decreased to the ‘Little or no impact’ severity level (Fig 1) already during the first control after surgery, and persisted similarly low during subsequent visits. Alike results were observed in the VAS. The total number of attacks also decreased significantly from  $44,7 \pm 19,6$  to  $13,2 \pm 7,4$  per month. Electrode migration requiring a re-intervention was observed in two patients at 12 days and at 3 months after surgery, regaining the initial benefit in one case. One patient passed away during follow-up due to an unrelated cause.

### Discussion

Our results show that combined invasive SPG and GON neuromodulation significantly and enduringly improve CCH symptoms in a group of refractory patients. If corroborated in larger cohorts, findings from our study suggest that this combined approach might be superior to each of the two techniques it comprises alone. Patients should be closely followed during the first months after surgery because of the risk of lead migration.

### Conclusions

Synergic SPG- GON stimulation is a promising alternative for long-lasting CCH control.

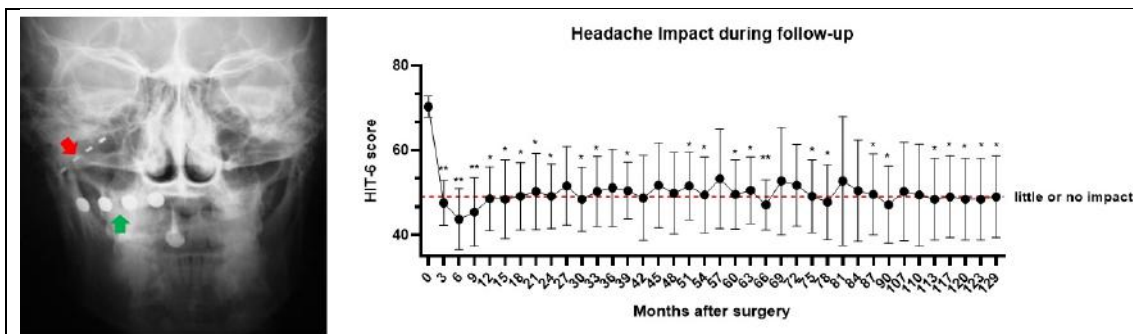


Figure 1. Left: Anteroposterior X-ray of a patient who underwent infrazygomatic percutaneous lead implantation for SPG stimulation (red arrow) and a paddle lead for GON stimulation (green arrow). Right: Mean (and SD) HIT-6 values during follow-up (last observation carried forward). The asterisks denote statistically significant (\*  $p < 0.05$ ; \*\*  $p < 0.01$ ) differences with respect to baseline. The red line at  $y = 49$  depicts the ‘little or no impact’ threshold for this scale.