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High-frequency Spinal Cord Stimulation as a Palliative Treatment for Patients with Low Back and Lower Extremity Radiated Chronic Pain

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Introduction

Since "Gate Control" theory was published, Spinal Cord Stimulation (SCS) has been used in palliative management of Low-back Pain (LBP) and lower extremity Radiated Pain and functionality in patients with Lumbar Stenosis , Degenerative Scoliosis or Failed Back Surgery Syndrome (FBSS). Our aim is to describe our experience with High Frequency Spinal Cord Stimulation.Low back pain (LBP) and lower extremity radiated pain (RP) are cause of chronic pain and disfunction in more than 1.500 million people around the world. One out of four people will experiment one or both of these conditions in a lifetime and will aٶect their daily life activities or their emotional or psychosocial spheres . In case of refractory pain, recently Spinal Cord Stimulation (SCS) has proved superior results to re-surgery or non-operative management with pharmacology analgesic. Neurophysiological principles, in which SCS sustains its functioning, begin in 1965, when Melzack and Wall published their revolutionary “Gate control” theory. Hey aټrm that one Aβ myelin fibers stimulus in dorsal column, not only can an inhibit ascending pathway pain sensation vehicle by small C and Aδ sensory fibers by the stimulus of monosynaptic inhibitory interneurons; but also, stimulating the descending modulatory pain pathway, by stimulating the rostral central nuclei of the brainstem. He eٶect of these two actions results in a lower pain perception in cerebral cortex.

A retrospective, descriptive study was carried out with a group of 30 patients treated at our institution (between November 2014 and June 2017) with a 10 kHz HF-SCS (Senza System; Nevro Corp, USA), with a diagnose of LS, DS or FBSS with refractory LBP associated or not RP to their low extremities. All patients had a minimum 12 months follow-up. As inclusion criteria all the patients were older than 40-year-old, history of more than 6 months of LBP o RP to lower extremities with a VAS score 5 despite other treatments (opioid drugs, physical therapy, epidural steroid injections, radiofrequency neurotomy and previous surgery). All the patients were not candidates to a surgery because of their global health status or because there were no clear cause of pain aier previous lumbar or thoracolumbar fusion. All patients without complete follow-up till month 12 aier SCS implantation were excluded of the study. Two types of electrodes were used in our population of study.

At last, we observed that all the patients who suٶered from electrodes mobilization, were patients with cable electrodes. None of them had paddle electrodes. Despite the small incision and laminotomy needed to place paddle electrodes, the precision to assure the posterior and medial correct position in unique attempt, can influence in this circumstance. Besides, paddle electrodes seem to decrease pain and improve functionality versus cable electrodes. All of these results were exploratory and not our principal aim, and also, small paddle electrode group (n=4) compared to cable electrode group (n=26) make comparison imprecise. Prospective studies and equivalent groups with longer follow up are recommended in the future to confirm this observation.

HF-SCS could be an eٶective and clinically relevant palliative treatment for patients with refractory low back pain associated, or not, to lower extremities radiated pain. Especially in the elderly or those with high comorbidities with lumbar spinal stenosis, degenerative scoliosis or failed back surgery syndrome who are not candidates to surgery. It can lead into pain and functionality improvement, with high satisfaction but not exempt of complications

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