

Electroacupuncture in the treatment of refractory neuropathic pain

Abstract

The technique of acupuncture frequently used in cases of neuropathy consists of inserting needles into classic acupuncture points along the affected nerve and may be associated with manual or electrical stimulation. This article aims to report the case of a 47-year-old male patient with chronic postoperative neuropathic pain difficult to control and refractory to treatment who responded positively with the use of electroacupuncture bordering the cicatricial region. He was previously submitted to conservative and interventional treatments with moderate results. He was admitted to our AcupunctureSector where three cycles of acupuncture were performed. Due to the return of intense pain, in the third cycle, electroacupuncture procedures with cutaneous-neural needlework were started margining the surgical scar. He presented progressive improvement and was discharged from the outpatient clinic with pain of mild intensity, remaining stable for the next eight months until the writing of this article, without regular use of pain medications. This case demonstrates anew possibility of successful treatment of neuropathic pain after traumatic injury, using cutaneous neural needlework and electroacupuncture, and should serve as an incentive for new clinical uses of the technique and conducting research that demonstrates and proves its efficacy.

Keywords: eletroacupuncture, neuropathic pain, surrounding needling, surrounding the dragon, Wei Ci

Volume 14 Issue 5 - 2021

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Received: January 11, 2021 | **Published:** October 11, 2021

Introduction

Neuropathic pain is defined by the International Association for the Study of Pain as pain caused by an injury or disease of the somatosensory nervous system.¹ Nerve damage result in structural and/or functional changes in the nervous system that cause a variety of symptoms that may be continuous or intermittent, including hyperalgesia, allodynia, hypoalgesia, paresthesia, dysesthesia and hypoesthesia.² Several traumas can cause neuronal damage and result in peripheral neuropathy. Damage may result from nerve compression, ischemia, or laceration.³ Trauma resulting from surgery may result in neuropathic pain, and the overall incidence of post-surgical chronic pain is estimated to be 20-50%.^{2,3}

Until the 1970s the evidence for the use of acupuncture was confined to the empirical experiences of each practitioner. However, in the last 25 years, clinical and experimental studies in the current molds have demonstrated the efficacy and effectiveness of acupuncture intervention in several conditions, including neuropathic pain.⁴ It should be emphasized that classical acupuncture is only part of the therapeutic practice of contemporary acupuncture, and that western research involving acupuncture has been concentrating on the knowledge about the neurochemistry of analgesia in relation to the central and peripheral nervous system.⁵ In this context, a growing number of researches using electroacupuncture (EA) procedures are observed.

The EA involves the passage of an alternating electric current in the form of pulse sequences, at certain frequencies, through tissues of the body by means of acupuncture needles for therapeutic purposes. The technique was introduced in China in 1958 with the aim of optimizing acupuncture analgesia in surgical procedures.⁵ Depending on the frequency of the electrical pulse sequences, different neurotransmitters and neuromodulators can be released and a combination of low and high frequencies can be used to release the maximum of different

types of neurotransmitters.^{5,6} A large number of studies with EA show that low frequency is preferable to high frequency to produce a lasting relief of chronic pain.⁵⁻⁷ More potent and more prolonged inhibition of mechanical allodynia and hyperalgesia in neuropathic pain were observed, using frequencies between 2 and 10Hz instead of 100Hz.⁶ This is due to the selective release of more neurotransmitters with longer half-lives, such as endomorphins, beta-endorphins and enkephalins, in the lower frequencies.^{6,8,9}

In order to avoid the neurological effect of stimulus tolerance, alternating sequences of different frequencies (dense-disperse wave) or alternating sequences with periods of absence of stimulus (intermittent wave or burst) are used.^{10,11}

The technique popularly known in China as surrounding the dragon or surrounding needling consists of surrounding the affected area with the insertion of several needles directed towards the center. It is an effective method to provide analgesia and reduce tissue edema and inflammation, alleviating pain.^{12,13} In cases of neuropathies, the type of acupuncture approach frequently used consists of insertion of needles into classic acupuncture points located along the territory of the affected nerve,¹⁴ and may be associated with manual or electrical stimulation.

The aim of this article is to report the case of a patient with chronic neuropathic pain, progressive, difficult to control and refractory to treatment, after surgical manipulation, who responded positively to the treatment with the use of EA bordering the cicatricial region.

Case description

47-year-oldmale, with diagnosis of chronic neuropathic pain in right thoracic-abdominal topography, in the territory of thoracic roots from T8 to T10, related to surgical manipulation for cholecystectomy in 2009. He had frequent pain with intensity of 8 to 10 on the Visual Analogue Scale for Pain (VAS), causing a significant reduction in

quality of life. The patient underwent recommended drug treatments for the condition, including the use of gabapentin, carbamazepine, amitriptyline and diazepam. Due to poor response to conservative treatment, he underwent interventional therapies such as infiltrations, myofascial, dorsal and lumbar paravertebral anesthesia and finally, pain pacemaker implantation in roots from T8 to T9 in 2013, resulting in considerable improvement, but still maintaining moderate pain levels (VAS5). This meant reduction of up to 50% of the initial pain intensity. He evolved with depression and fibromyalgia, receiving follow-up from psychiatry.

He was admitted to the Acupuncture sector of the Federal District Base Hospital, Brasília - Brazil, on June 2018, presenting a value of 4.7 in a total of 5.0 on the Catastrophizing Thoughts Scale, intensity of 5 in a total of 10 on the VAS-Pain, with frequent visits to the emergency room. Three cycles of acupuncture were performed, the first in 2018, the second in 2019 and the third in 2020. In the first two cycles, the intervention was based on the principles of the Rationality of Traditional Chinese Medicine, using only classic points of acupuncture at a distance, with good control of the emotional picture and partial improvement of pain, leading the patient to suspend all medications on their own, even without the consent of the prescriber doctor. Eleven months have passed without acupuncture between the first and second cycle and forty-five days between the second to third cycle.

Before the third cycle, the patient returned with bouts of intense pain (VAS 10), with weekly visits to the emergency room. Then EA procedures were initiated with cutaneous-neural needle marking the surgical scar (Figure 1), with dense-disperse stimulus and frequencies of 3/10Hz, during 5 seconds each sequence, for 30 minutes. Skull acupuncture was performed with the insertion of the Five Frontal Needles (Figure 2), and also needlework at classic points covering YinTang (Ex-HN3), Baihui (GV20), Hegu (LI4), Taichong (LR3) and Zuzanli (ST36), without EA. Ten sessions were held once a week. The patient presented progressive improvement over the weeks and was discharged from the outpatient clinic with mild pain (VAS 2). He did not seek an urgent care clinic again throughout the treatment period, indicating a significant improvement in quality of life and mood. He remained with mild pain (VAS 3) for the next eight months until the writing of this article and he left without regular use of any pain medication, but reporting a return to an urgent care clinic three times in the last five months after the end of the last cycle.

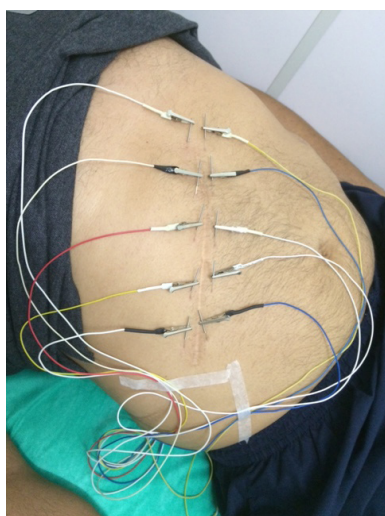


Figure 1 Cutaneous-neural electroacupuncture bordering surgical scar on abdomen.



Figure 2 Skull Acupuncture in five frontal points.

Discussion

Neuropathic pain is a refractory chronic pain syndrome with a complicated mechanism, due to the primary lesion of the central or peripheral nervous system and does not present effective therapy.^{14,15} Acupuncture treatment has received attention worldwide as a strategy to relieve pain, and it is an indication of non-pharmacological treatment for neuropathic pain.^{2,16} New studies associated with clinical practice demonstrate that a treatment performed with several acupuncture sessions has the capacity to induce an obvious analgesic effect.^{15,17}

Among possible techniques, the insertion of needles along the affected nerve can be used, stimulating an anti-inflammatory reaction and helping in the regeneration of damaged nerve fibers.⁸ A recent meta-analysis performed in the United States showed that all the acupuncture techniques used to treat neuropathic pain used the reasoning of Traditional Chinese Medicine and involved the needling of classical points near the injured peripheral nerves.¹⁴ A treatment also frequently used consists of insertion of paravertebral needles, performing segmental stimulation corresponding to the affected spinal nerves, and it is possible to use manual or electric stimulation.⁸

In our case report we did not use the paravertebral segmental electric stimulation due to the presence of pacemaker installed in the roots of T8 to T9. We chose to use a variation of the aforementioned approach, known as surrounding the dragon or surrounding needling, with local action mechanism at the nerve ends, possibly exerting a direct effect on the adjacent nerves and perineural tissues, helping to reestablish connective tissue changes.^{14,18} This traditional method consists of inserting needles perpendicularly into healthy skin with an intact nervous system, close to the injured area, where an increase in circulation would be beneficial.¹⁸ In the case described, we used subcutaneous needling with parallel insertion to the 3.5cm skin surface, bordering the entire cicatricial lesion, associated with the use of EA with dense-disperse stimulus of 3/10Hz.

After bibliographic research in index databases (Pubmed), using the keyword surrounding the dragon and acupuncture, only one article was found. It used the traditional technique with success in the treatment of neuropathic pain, also in a case of post-cholecystectomy,¹⁹ and there are no other publications describing the use of the similar technique or association with electroacupuncture.

Conclusion

This case demonstrates a new possibility of successful treatment of neuropathic pain after traumatic injury, using cutaneous-neural needlework and EA, and should serve as an incentive for new clinical uses of the technique and conducting researches that demonstrate and prove its efficacy, since the publications on the subject are scarce.

Acknowledgments

None.

Conflicts of interest

The authors declare that they have no conflicts of interest related to the material of this manuscript.

Funding

The authors declare that they have no financial interests related to the material of this manuscript.

References

- Jensen TS, Baron R, Haanpaä M, et al. A new definition of neuropathic pain. *Pain*. 2011;152(10):2204-2205.
- McCarberg B, D'Arcy Y, Parsons B, et al. Neuropathic pain: a narrative review of etiology, assessment, diagnosis, and treatment for primary care providers. *Curr Med Res Opin*. 2017;33(8):1361-1369.
- http://www.iasppain.org/files/Content/ContentFolders/Publications2/PainClinicalUpdates/Archives/PCU_19-1_for_web_1390260524448_6.pdf
- More AOO. Neurobiological evidences of specificity Acupuncture points: a comparative study of the mechanisms of antinociceptive action of the BL60 and SP6 acupoints in Mice. Paper presented to the Regional Hospital of São José Homero de Miranda Gomes, as a requirement for the conclusion of the Medical Residence in Acupuncture. 2009; São José.
- Bowsher D. Mechanisms of acupuncture. In Filshie J, White S, Editors. *Medical acupuncture: a Western scientific approach*. UK: Churchill Livingstone, Edinburgh; 1998. pp. 69–82.
- Zhang R, Lao L, Ren K, et al. Mechanisms of acupuncture-electroacupuncture on persistente pain. *Anesthesiology*. 2014;120(2):482-503.
- Mayor D. An exploratory review of the electroacupuncture literature: clinical applications and endorphin mechanisms. *Acupunct Med*. 2013;31(4):409-415.
- Yun-Tao Ma, Mila Ma, ZangHee Cho. *Biomedical Acupuncture for Pain Management*. UK: Churchill Livingstone Elsevier; 2005.
- Stux, Gabriel, Hammerschlag, et al. *Clinical Acupuncture: Scientific Basis*. Spain: Springer; 2001.
- Amestoy RDF. *Electrotherapy and electroacupuncture*. 1st edn. Florianópolis: Bristot; 1998.
- Zhixian L. *Acupuncture and Moxibustion*. 1st edn. Beijing: Academy Press; 1999. p. 251-260.
- Redfearn T. Surrounding the dragon. *Acupuncture Medical*. 1992;10:73-74.
- Hengze X, Yitian N, Yaoguang L, et al. Acupuncture treatment of common disease based upon differentiation of syndromes, 1st edn. Beijing: People's Medical Publishing House; 1988. pp. 360-361.
- Dimitrova A, Murchison C, Barry O. Acupuncture for the Treatment of Peripheral Neuropathy: A Systematic Review and Meta-Analysis. *J Altern Complement Med*. 2017;23(3):164-179.
- Gao YH, Li CW, Wang JY, et al. Activation of hippocampal MEK1 contributes to the cumulative antinociceptive effect of electroacupuncture in neuropathic pain rats. *BMC Complementary and Alternative Medicine*. 2016;16:517.
- Vickers AJ, Cronin AM, Maschino AC, et al. Acupuncture for chronic pain: individual patient data meta-analysis. *Arch Intern Med*. 2012;172(19):1444–1453.
- Wang GB, Wu LZ, Yu P, et al. Multiple 100Hz electroacupuncture treatments produced cumulative effect on the suppression of morphine withdrawal syndrome: Central preprodynorphin mRNA and p-CREB implicated. *Peptides*. 2011;32(4):713–721.
- Campbell A. Métodos de acupuntura. In: Filshie J, White A, Editors. *Medical acupuncture: a scientific approach from the western point of view*. São Paulo, 1st edn. São Paulo: Roca; 2002. 21-37p.
- Fang S. The successful treatment of pain associated with scar tissue using acupuncture. *J Acupuncture Meridian Study*. 2014;7(5):262–264.