

PHYSIOTHERAPEUTIC INTERVENTION IN CHRONIC PAINFUL POST-TRAUMATIC TRIGEMINAL NEUROPATHY: CASE REPORT

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Abstract: Justification and goals: Painful post-traumatic trigeminal neuropathy (PTPT) is characterized by neuropathic pain of traumatic origin that affects one or more branches of the trigeminal nerve, and may develop spontaneous and evoked pain from a trigger zone of moderate to severe intensity, dysesthesia, hypersensitivity, allodynia, hyperalgesia and hyperpathy. The objective of this study was to carry out a protocol of physical therapy intervention in a patient affected by NTPT relating it to functionality and pain. **Case report:** Male patient, 27 years old, who underwent orthognathic surgery for mandibular correction, reported an abnormal pain in the mental region, which made him search for a correct diagnosis and adequate treatment, being later diagnosed as having chronic neuropathic pain. The combination of drugs such as antidepressants, anticonvulsants and topical anesthetics were the initial basis for pain control, however, with the permanence of pain and medication side effects, he underwent several types of treatment, but did not obtain significant results. Seeking from this, a specialized treatment of physiotherapy to help him in relation to the signs and symptoms presented in the orofacial region. After 10 months of rehabilitation, totaling 40 treatment sessions, the patient had his clinical conditions modified in terms of pain and motor function. **Conclusion:** The protocol proposed in this study proved to be effective and with good results in the treatment of PTPT, acting in the reestablishment of neuromuscular function, reduction in pain perception, drug stabilization and improvement in the patient's quality of life.

Keywords: Facial Neuralgia, Facial Pain, Chronic Pain, Trigeminal Nerve Injuries, Physical Therapy Modalities.

INTRODUCTION

According to the International Association for the Study of Pain (IASP), neuropathic pain (NP) is defined as an abnormal sensation of pain that is caused after a primary or dysfunctional lesion in the peripheral or central nervous system without nocicept stimulation. -peripheral log.^{1,2} NP can occur after direct or indirect trauma to peripheral sensory nerves, and these painful neuropathies can be seen after tissue damage and/or associated with bone fractures, leading to persistent sensory damage, chronic neuropathic pain, or both.³

Painful Post-Traumatic Trigeminal Neuropathy (PTNT) is characterized by neuropathic pain of traumatic origin that affects one or more branches of the trigeminal nerve (TN). His pain is described as unilateral or bilateral in the orofacial region, strong, searing, intolerable, with a significant impact on the patient's quality of life.⁴

Injury to the NT branches may result from macrotrauma in the craniofacial area, dental interventions, oral and maxillofacial surgery.⁵ ⁶ Nerve damage is a prerequisite for the development of chronic post-traumatic pain. In addition to sensory loss, spontaneous and evoked pain from a trigger zone of moderate to severe intensity, dysesthesia, hypersensitivity, allodynia, hyperalgesia and hyperpathy can occur.⁷

The treatment of neuropathic pain, including NTPT must be done with drugs that show a degree of efficacy and safety to the patient, especially tricyclic antidepressants, anticonvulsants and topical anesthetics.⁸ ⁹. In addition to drugs, other treatment options have been proposed and important for refractory NTPT patients, such as local injection of lidocaine, botulinum toxin-A, functional cognitive therapy, pulsed radiofrequency, transcutaneous magnetic stimulation and specific approaches through physical therapy.⁹

Physiotherapy has played a fundamental role in the treatment of neuropathic pain, as it has a series of active and passive physical resources, together with pain education, which can modify the distorted perception of pain and decrease the sensitization of the nervous system.¹⁰

The physiotherapeutic resources used in the treatment of PTPT or neuropathic pain aim at a gradual return to daily activities and better coping with pain with quality of life. However, there are numerous options and therapeutic resources are applied according to a thorough evaluation that will be differentiated in each patient.^{11, 12}

Therefore, this study aimed to report the case of a patient affected by NTPT submitted to a protocol of physiotherapeutic intervention using low-level laser, mastication instrument with hyperboloid, facial mimicry and manual therapeutic resource and verify its results with specific questionnaires, relating them to functionality and pain.

CASE STUDY

The present case study was developed in a descriptive way, and the participant was in agreement with the Free and Informed Consent Term. The study was developed in a private physiotherapy place in the city of Manaus/AM, from June 2019 to March 2020.

This is a male patient, 27 years old, who in February 2017 underwent orthognathic surgery for correction of mandibular retraction (Class II of Angle⁵). After the surgery, he reported that he felt a sharp pain, characterized by constant burning and pressure, and the reason was not known until that moment. Since then, she has started using the drugs commonly used to treat patients with chronic pain (analgesics, antidepressants and antiepileptics), in addition to consultations with various health professionals in the city.

During this same period, he was hospitalized twice because of the intensity of the pain. Three months after orthognathic surgery, he underwent an exploratory procedure to remove the fixation mechanisms implanted in the chin region. The pain, however, got worse, and the dose of the drugs used had to be increased. After these procedures, he was diagnosed at HC-USP as having chronic neuropathic pain, derived from a lesion in the V3 branch of the trigeminal nerve that runs through the mandible region in the right mental region, characterizing PTPT.

In view of the permanence of pain and side effects of the medications, he was initially submitted to an anesthetic block in the injured area and, when the procedure was unsuccessful, to two radiofrequency rhizotomies. However, the pain remained unchanged.

In 2018, in view of all drug combinations, the use of cannabidiol was prescribed. However, it did not have the desired effects, due to side effects such as dizziness and drowsiness. In the same year, he started daily rivotril mouthwash, with the purpose of desensitizing the painful region, offering a more stable period of his symptoms. However, at the beginning of the year 2019, the pain again intensified. The expected analgesia of the drugs reduced and the side effects increased.

Because of this, the transdermal application of botulinum toxin (BT) in the chin region was recommended. After the first application, he reported loss of motor function in the region, and after a month, he made the second application, and none of the applications generated improvement in pain.

However, in the interval between the first and second application of TB, in June 2019, the patient sought an evaluation and specialized physiotherapy conducts in the city of Manaus that would help him in relation

to the signs and symptoms resulting from neuropathic pain and motor dysfunction in orofacial region. In the evaluation, they were asked to respond to the Lanns Pain Scale ¹³, which had a total score of 17 points, that is, probably neuropathic mechanisms were contributing to the patient's pain. Added to this, he answered the questionnaire for the diagnosis of neuropathic pain (DN4)¹³, who reported that pain in the chin region of the mandibular bone is characteristic of burning and electric shock, with the presence of pins and needles and numbness. Physical examination showed hypoesthesia on touch and needle prick, and increased pain due to brushing or light touch in the painful area (allodynia), characterizing neuropathic pain, with a variation of the Numerical Pain Scale (END 0-10) between 5 and 10 points. In addition, decreased oral motor skills were detected in the orbicularis oris, lower lip depressor and mentalis muscles.

The physiotherapeutic treatment aimed to improve the pain, decrease the amount or dosage of neuropathic medications together with the doctor in charge and reestablish the motor function of the orofacial region. one hour, through the conducts with the low intensity laser in the intra and extraoral region in the injured region and in the entire V3 branch (35 J/cm² ~ 3J); exercises with

facial mimicry expressions; exercises with the Hiperboloid - chewing instrument, to assist in painful desensitization, muscle stimulation, strengthening and stretching of the structures of the orofacial region; and intra and extra oral manual therapy with more superficial and deeper stimuli in order to stimulate the affected musculature and the area injured by the trauma, caused by hypersensitivity and allodynia.

After 40 treatment sessions, through the procedures proposed in the office and guidance on specific exercises to be performed at home, the patient's clinical conditions were modified, thus altering the perception of pain and motor function. As shown in Table 1, the medications changed during the course of treatment. Being, reassessed and monitored at the beginning, middle and end of therapy.

The pain picture showed considerable improvement compared to the beginning (END 7) and end (END 4) of treatment. However, the patient was asked to answer the Neuropathic Pain Symptom Inventory at the end of the forty consultations. (ISDN) ¹³, to assess the effects of treatment on neuropathic diseases (Table 2). In which the difference between before and after rehabilitation is noticed by the patient's perception of their symptoms.

MEDICINE	Start of treatment	20 attendances	40 attendances
Amitriptilina	75mg	75mg	75mg
Oxcarbazepina	450mg	-	-
Lamotrigina	200mg	100mg	150mg
Gabapentina	900mg	-	-
Restiva	5g	5g	2,5mg
Pregabalina	-	75mg	225mg
Rivotril	6 drops	6 drops	6 drops

Table 1. Associations of drugs that were administered at baseline, after 20 and 40 visits.

Q1. Does your pain feel like a burning sensation?		
It does not get burned	0 1 2 3 4 5 6 7 8 9 10	The worst burn imaginable
Q2. Does your pain feel increasing?		
The pain does not increase.	0 1 2 3 4 5 6 7 8 9 10	Aperta o pior imaginável
Q3. Does your pain feel like pressure?		
No pressure	0 1 2 3 4 5 6 7 8 9 10	The worst pressure imaginable
Q4. During the past 24 hours, has your spontaneous pain been present:		
Permanently	X	X
Between 8 and 12 hours		
Between 4 and 7 hours		
Between 1 and 3 hours		
Less than 1 hour		
Q5. Does your pain feel like an electric shock?		
No electric shock	0 1 2 3 4 5 6 7 8 9 10	The worst electric shock imaginable
Q6. Does your pain feel like a stabbing sensation?		
No stab	0 0 2 3 4 5 6 7 8 9 10	The worst possible stab
Q7. During the last 24 hours, how many of these pain attacks have you had?		
Over 20		
Between 11 e 20		
Between 6 and 10		
Between 1 and 5	X	X
No pain attacks		
Q8. Is your pain provoked or increased by lightly touching the painful area?		
No pain	0 1 2 3 4 5 6 7 8 9 10	The worst pain imaginable
Q9. Is your pain provoked or increased by pressure on the painful area?		
No pain	0 1 2 3 4 5 6 7 8 9 10	The worst pain imaginable
Q10. Is your pain provoked or increased by contact with something cold in the painful area?		
No pain	0 1 2 3 4 5 6 7 8 9 10	The worst pain imaginable
Q11. Does the person feel pins and needles?		
No pins or needles	0 1 2 3 4 5 6 7 8 9 10	The worst pins and needles imaginable
Q12. Does the person feel numb in any part of the body?		
No numbness	0 1 2 3 4 5 6 7 8 9 10	The most dormant imaginable

Table 2. Questionnaire (ISDN) in the initial evaluation (blue) and after 40 consultations (red) with physical therapy.

In addition, the motor part had the total reestablishment of its functions, mainly in speech and chewing, thus stabilizing the medication dosage.

DISCUSSION

According to the IASP, neuropathic pain is a complex and pathological condition, difficult to treat, which significantly compromises quality of life.¹⁴

Patients with neuropathic pain experience a variety of painful sensory symptoms, contributing to decreased ability to perform daily activities and worse health status, which lead to physical, psychological, and social changes.¹⁵

An adequate treatment plan is necessary through a detailed clinical evaluation and through specific questionnaires, such as the DN4 questionnaire, Lanns pain scale and the ISDN.¹³

Depression, anxiety, and sleep disturbances are common in patients with chronic NP and may be accompanied by substance abuse, abnormal illness behavior, or adaptation to chronic illness¹⁶.

Pharmacological therapy is often associated with systemic side effects^{1, 4}. Therefore, it is necessary to complement with other treatment options to control refractory neuropathic pain.^{4, 9} However, in this case, botulinum toxin-A did not have a positive response to reduce or eliminate pain, causing negative consequences for the patient's orofacial motricity.

However, a physiotherapeutic protocol was developed through techniques and exercises with the purpose of modulating symptoms, providing pain relief, improving orofacial motricity, progressive reduction for stabilization of medications and gain in quality of life.

Low-level laser therapy has a biomodulatory effect and has been indicated

in cases of pain and tissue repair.¹⁷ However, the parameters are still widely discussed in the literature, which makes it difficult to establish adequate protocols detailing the parameters in the control of neuropathic pain, especially in PTPT.

Exercises through manual therapy also aim to reduce clinical symptoms¹⁸. Among manual therapy techniques, myofascial release is widely used in clinical practice, as it aims to desensitize and increase local blood perfusion, thus reducing pain intensity and improving motor and tissue function.¹⁹

In addition to laser and manual therapy, the Hiperboloid was used, a chewing instrument that aimed to work on mandibular movements and tissue components, in order to promote the modulation of muscle electrical activity, strengthening, increase in local blood flow, reduction of jaw pain and proprioception^{20, 21}. Patient, in addition to performing the exercises in the office, also performed them at home to assist and accelerate the therapeutic gain.

To complement the treatment, facial mimicry has become of great value for muscle and joint functional restoration and reduction of pain perception arising from hypersensitivity or allodynia present in neuropathic patients.²² Facial expressions such as "pouting", "face with a bad odor", among others, were exercises that the patient practiced in physical therapy and home sessions, together with the Hiperboloid.

CONCLUSION

The physiotherapeutic intervention proved to be effective and with good results, acting in the re-establishment of neuromuscular function, improving the perception of pain and, consequently, the quality of life of the patient. It is necessary and important to produce new research on NTPT, especially the physiotherapeutic

approach and its effects, in order to support future intervention protocols.

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