Treatment of postoperative localized neuropathic pain with topical 5% lidocaine. Case report

Tratamento da dor neuropática localizada pós-operatória com lidocaína tópica a 5%. Relato de caso

André Liggieri[1], Fabíola Minson[2], Mariana Palladini[3]

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ABSTRACT

BACKGROUND AND OBJECTIVES: Post-surgical neuropathic pain (NP) is an important clinic condition, with recurring pain and that may be a result of transection, contusion, nerve inflammation or stretching and lasting for 3-6 months. Having into consideration the prevalence of postoperative localized NP, its impact in quality of life of patients, its complexity of diagnosis and treatment and available treatment options, the aim of this report was to present efficacy, safety and tolerability outcomes of 5% lidocaine transdermal patch use as a single treatment or in combination with other therapeutic options by describing and analyzing four clinical cases.

CASES REPORT: Four patients aged between 43 and 70 years old and complains of postoperative localized NP were managed with 5% lidocaine transdermal patch in prolonged treatment, with significant improvement in pain scores.

CONCLUSION: The outcomes of the described cases revealed that postoperative localized NP management was successful with 5% lidocaine transdermal patch. Moreover, it was possible to observe that its association to other treatments (pharmacological or not) has proved efficacy with no negative impact the tolerability of the treatment or the patient routine and comfort.

Keywords: Case-control studies, Nerve compression, Pain, Peripheral nervous system disease, Postoperative, Transdermal patch.

RESUMO

JUSTIFICATIVA E OBJETIVOS: A dor neuropática (DN) pós-operatória é um problema clínico relevante, com dor persistente, que pode ser resultado de transecção, contusão, alongamento ou inflamação do nervo, durando geralmente cerca de 3-6 meses após a cirurgia. Tendo em consideração a prevalência estimada da DN localizada pós-operatória, seu impacto na qualidade de vida dos pacientes, sua complexidade diagnóstica e terapêutica, e as opções de tratamento disponíveis, o presente estudo teve como objetivo apresentar os desfechos de eficácia, segurança e tolerabilidade do uso do emplastro de lidocaína a 5% nesta condição clínica, seja como fármaco isolado ou em combinação com outras classes terapêuticas.

RELATO DOS CASOS: Quatro pacientes com idades entre 43 e 70 anos e com história de DN localizada pós-operatória foram manejados com emplastro de lidocaína a 5% em tratamento prolongado, com melhora significativa do nível de dor.

CONCLUSÃO: Os resultados dos casos apresentados neste estudo revelam que o manejo da DN localizada pós-operatória foi eficaz com a utilização do emplastro de lidocaína a 5%. Além disso, foi possível observar que sua associação com outros tratamentos (farmacológicos ou não) mostrou-se efetiva, sem impactar negativamente a tolerabilidade do tratamento ou o conforto do paciente.

Descritores: Adesivo transdérmico, Compressão nervosa, Doenças do sistema nervoso periférico, Dor, Estudos de casos-controle, Pós-operatório.

INTRODUCTION

Postoperative neuropathic pain (NP) is a relevant clinical problem with persistent pain, which may result from nerve transection, contusion, stretching or inflammation[1], usually lasting 3-6 months after surgery. This type of pain represents the second most frequent NP cause and its prevalence varies substantially

André Liggieri – https://orcid.org/0000-0002-5035-6481;
Fabíola Minson – https://orcid.org/0000-0001-9057-9690;
Mariana Palladini – https://orcid.org/0000-0002-7688-3861.

1. Brazilian Medical Association, Orthopedic with Expertise in the Pain Area, São Paulo, SP, Brazil.
2. Paulista State University Julio Mesquita Filho, Physician Anesthesiologist, São Paulo, SP, Brazil
3. São Paulo State Center for Pain, Founder and Chief Medical Officer, São Paulo, SP, Brazil.

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HIGHLIGHTS

- Neuropathic pain is caused by a lesion that affects the somatosensory system.
- Neuropathic pain affects about 10% of the population.
- Neuropathic pain can impact patients' quality of life and functionality.
- The lidocaine patch produced analgesia in the cases studied, with long-term safety and tolerability.

Correspondence to:
André Liggieri
E-mail: acliggieri@hotmail.com

depending on the type of operation and the means of assessment[2]. In a survey[3], the prevalence of post-surgical NP after 6 months was 3.2% for inguinal hernia repair and 37.1% for mastectomy, with an average of 12.8% for all surgeries.

This condition starts as a consequence of a lesion in the main peripheral nerves, triggering phenotypic neuronal changes due to neuronal plasticity, accompanied by an inflammatory response[2]. Unlike postoperative pain, which tends to decrease over time, postoperative NP tends to increase 31.3% at 6 months and 35.4% at 12 months after the procedures[4]. Thus, it is estimated that the number of patients affected by postoperative NP is significant, with an important impact on society, besides the prolonged individual suffering[2].

Localized neuropathic pain (LNP) is a type of peripheral NP, characterized by presenting a well-defined and circumscribed area of intense pain, smaller in size than an A4 sheet of paper. This condition corresponds to about 60% of all cases of NP, and is its most common form[5].

LNP management, in general (whether postoperative or of any other etiology), can be complex, especially when it is not correctly diagnosed and treated. In order to assist non-specialists in diagnosing LNP, some authors[6] have developed a diagnostic tool for the screening of this condition, based on four questions that take into account International Association for the Study of Pain (IASP) diagnostic criteria and the pain area size. To identify a probable LNP diagnosis using this tool, it is necessary that the patient's clinical history is compatible with a peripheral nerve lesion or disease, that the pain distribution has neuroanatomical plausibility, that the physical examination demonstrates the presence of negative (such as hypoesthesia) or positive (such as hyperalgesia or allodynia, for example) neurological signs in the presumed compromised nerve territory, and that the pain is confined to an area smaller than that of an A4 sheet of paper[6].

To evaluate the accuracy of this tool, a study[7] showed a sensitivity of 80% and specificity of 90.7% in distinguishing LNP from other types of pain, demonstrating its importance in clinical practice.

The first-line NP treatment is pharmacological, and several alternatives have been proposed, such as the use of gapabentinoids and antidepressants[8]. However, over the past few years international guidelines have included topical treatments such as 5% lidocaine or 8% capsaicin patches for DNL treatment[9-12].

Lidocaine patch has the advantage of lower risk of adverse effects, and can be used in combination with other drugs, with low risk of pharmacological interactions[9].

The IASP's Neuropathic Pain Special Interest Group (NeuPSI) consensus (2015)[10] considered 5% lidocaine patch as a second-line alternative for LNP, whereas, according to the recent French Society for the Study and Treatment of Pain (Société Française d'Etude et de Traitement de la Douleur - SFETD) consensus, published in 2020[12], the lidocaine patch 5% was indicated as first-line treatment for LNP, especially in seniors and comorbid or polymedicated patients, thanks to its favorable risk/benefit profile and long-term safety, tolerability, and efficacy[12]. Topical lidocaine also has the advantage of reducing allodynia and being easy to apply by the patient[9].

Lidocaine patch has both pharmacological action, inhibiting voltage-dependent sodium channels in damaged sensory fibers of type C and Aδ, and mechanical action through the protective hydrogel layer[13], and its analgesic efficacy against LNP is well documented in the literature[14-17]. A study on patients with LNP secondary to post-herpetic neuralgia showed that, in addition to reducing intensity, there was a 66% reduction in pain area over three months of treatment with this drug[18]. In a multicenter, double-blind, placebo-controlled clinical study on localized peripheral postoperative NP, it was shown that the use of lidocaine patch promoted a decrease in pain intensity and area, with an adequate safety and tolerability profile[19].

Taking into consideration the estimated prevalence of postoperative LNP, its impact on patients' quality of life, its diagnostic and therapeutic complexity, and the available treatment options, the present study aimed to present the efficacy, safety, and tolerability outcomes of using 5% lidocaine patch for this clinical condition, either as an isolated drug or in combination with other therapeutic classes.

CASE REPORT

In this paper, prepared according to the CaRe Checklist (Case Report)[20], four distinct cases of DNL are addressed.

Case 1

Female patient, 70 years old, housewife, presented progressive pain in the left knee for 6 years, worsening with movement and with intensity evaluated by a visual analog scale (VAS) equal to 8/10. She was submitted to total knee arthroplasty, but developed in the first three months severe pain (VAS = 6) in the anterior and lateral regions of the left knee, with a burning sensation, shock, needling, tingling and numbness, showing little relief of symptoms with the use of tramadol 50 mg every 6 hours and dipyrone 1 g every 8 hours.

Physical examination revealed absence of myofascial trigger points, range of motion with 90° flexion and full knee extension, without instabilities. The operative wound presented good aspect, hypoesthesia to the touch of the lateral region associated with pain by light manipulation and by brushing (allodynia) of the operated knee anterior region.

Applying the diagnostic tool for LNP, the NP4 questionnaire (neuropathic pain 4)[19], a profile of postoperative LNP was identified, and it was indicated the use of 5% lidocaine patch on the site, initially for four weeks[6].

After this period, the patient reported a decrease in pain intensity to 4/10 in VAS and partial improvement of neuropathic symptoms, and was recommended to continue the treatment for another four weeks.

Upon the patient's return, pain intensity was reduced (EAV = 3/10), with the disappearance of most of the characteristic NP symptoms. In view of the clinical improvement, the maintenance of the treatment with lidocaine patch was proposed with monthly follow-ups, which resulted in a gradual favorable evolution. After seven months, there was complete remission of the condition, and the pharmacological therapy was then suspended.

Case 2

Male patient, A 44-year-old, engineer, with a history of right upper limb trauma after a water accident, with amputation of the thumb, fracture of the radius and ulna, extensive forearm injuries, and vascular insufficiency, requiring surgical repair, with radius and ulna osteosynthesis, radial and ulnar arteries revascularization with saphenous vein, thumb advancement flap, and composite dermal matrix graft in the forearm.

The patient developed in immediate postoperative period with excruciating pain in the forearm, with VAS equal to 10/10. During the 16-day hospital stay, pain was treated by blocking stellate ganglion and brachial plexus, inserting a perineural catheter with a patient-controlled analgesia pump, with 0.2% ropivacaine solution. The patient also received pregabalin 75 mg every 12 hours, dipyrone 1 to 2 g every 4 hours, and morphine 2 mg every 4 hours. The discharge prescription was pregabalin 150 mg every 12 hours, dipyrone 1 g every 6 hours and morphine 10 mg rescue doses. After 20 days, he returned with a complaint of intense burning pain, and methadone 10 mg every 12 hours was then associated. The patient returned after 30 days, still complaining of significant pain (VAS = 6) in the forearm and right hand, despite pharmacological treatment, with burning sensation, shock, painful cold, stabbing, tingling and numbness. He still required four rescue doses of oral morphine per week. The patient also was on concomitant treatment with vortioxetine, because he had an associated depressive condition. In an attempt to potentiate the treatment, manipulated gabapentin 150 mg every 12 hours was associated, and the patient was advised to return in 2 weeks.

Physical examination revealed well-healed surgical wounds and hypoesthesia to touch. Application of the NP4 questionnaire (one of the validated tools for NP screening, in which values ≥ 4 indicate positive screening for this condition) resulted in a score of 7[16].

The parameters evaluated by the diagnostic tool pointed to postoperative LNP, since the painful area was smaller than a sheet of A4 paper.

Due to the fact that there was complete healing, with intact skin, the association of lidocaine patch to ongoing treatment was proposed. After two weeks, the patient showed significant improvement, with a reduction in pain intensity (VAS = 3) and NP symptoms, and no longer requiring rescue morphine. As he did not present drowsiness, all drugs, including 5% lidocaine patch, were maintained, with the compounding gabapentin dose increased to 200 mg per day.

Reassessed after four weeks, the patient returned with VAS = 0 and almost complete disappearance of neuropathic symptoms, reporting only hypoesthesia. The methadone was gradually reduced until it was discontinued, and pregabalin 150 mg every 12 hours was maintained for another 2 months, with the proposition of weaning after this period. At this time, photobiomodulation, whose primary effect is analgesic, was indicated to improve healing (the lidocaine patch was suspended only for the duration of this therapy, being reintroduced afterwards), in addition to other measures, such as psychotherapy and meditation.

From then on, the patient was reassessed every two months, maintaining the use of gabapentin and lidocaine patch, evolving with gradual improvement. After eight months of this follow-up phase, gabapentin was weaned, and the lidocaine patch was also discontinued two months later due to resolution of the clinical condition.

Case 3

Male patient, 43 years old, nursing technician, underwent arthroscopy for ligament injury in the right knee four years ago. Six months after the procedure, he developed severe pain and limited flexion of the operated knee, and is currently off work. At the time of the reported pain, he was medicated with gabapentin 1200 mg/day and amitriptyline 25 mg/day.

The patient presented local complaints of sweating, edema, color changes, burning, shock, needling, painful cold sensation, tingling, numbness, and itching, in an area smaller than that of an A4 sheet of paper, with VAS = 5/10.

Physical examination revealed limited knee flexion and hypoesthesia to touch and needle prick. With the clinical data presented, a score of 9 was obtained in the NP4 questionnaire (neuropathic pain 4)[19], which, together with the application of the diagnostic tool, led to the conclusion that this was a case of postoperative LNP[6].

The treatment initially proposed was to replace gabapentin by pregabalin (with gradual dose titration) and maintain amitriptyline, with reassessment in 30 days. After this period, the patient showed no improvement in pain and began to complain of significant dizziness and drowsiness. Therefore, it was decided to suspend pregabalin, maintain amitriptyline, and associate 5% lidocaine patch, with reevaluation after four weeks.

Upon his return, the patient reported a good therapeutic response (with VAS reduction to 2/10) and was already able to start physical therapy intervention. The previous procedures were maintained and a new reevaluation was requested in four weeks. Upon reevaluation, the patient reported being quite satisfied, with no complaints of pain and disappearance of practically all NP symptoms (he only had local hypoesthesia). Maintenance of physical therapy was indicated, and lidocaine patch was discontinued, with good subsequent rehabilitation. After four months of follow-up, the patient was discharged with complete pain improvement.

The patient improved to VAS = 2/10. He uses pregabalin 150 mg at night and reports some pain on movement in the calf region; genicular nerve blocks and venous blocks are indicated before considering sympathetic block again.

Case 4

Female patient, 56-year-old, housewife, underwent left radical mastectomy three months before due to breast cancer. She reported pain that was difficult to control in the immediate postoperative period. At the time of consultation, she was undergoing adjuvant chemotherapy.

The patient developed pain in the surgical scar area, with burning sensation, painful sensation to cold, electric shock sensation, pinpricks, needlepoints, itching and excruciating pain upon light stimuli at the site (such as feeling a breeze). The pain intensity reported using VAS was equal to 8/10 at rest, increasing to 10 at light tactile stimuli on the spot (allodynia).

As a personal history, besides oncologic condition, she had chronic obstructive pulmonary disease (COPD), was a tobacco user smoking 30 cigarettes a day, had type 2 diabetes, and depression under treatment with escitalopram. The neurological sensitivity test revealed altered thermal sensation in the affected area, with positive mechanical allodynia to brushing and great pain with needle prick test.

Clinical history, anatomical plausibility, results of sensory tests and the painful area size defined by the patient (smaller than the area of an A4 sheet of paper), when applied to LNP diagnostic tool, pointed to post-mastectomy LNP. In this context, treatment with 5% lidocaine patch was indicated, initially for four weeks.

Upon her return, the patient reported a major response, with VAS reduction to 4/10 and significant improvement in neuropathic symptoms, especially allodynia, and lidocaine patch was maintained for another four weeks.

The patient was evaluated monthly, with reduction of the allodynia area and decrease of pain intensity gradually, using 5% lidocaine patch for a total period of seven months.

After this period, VAS decreased to 3/10 and there was a significant improvement in NP symptoms. The pharmacological management was maintained, with adequate pain control; however, the patient died six months after the beginning of treatment, as a consequence of the underlying disease.

DISCUSSION

Most guidelines and expert consensus on LNP treatment justify the 5% lidocaine patch efficacy with its ease of application, patient preference, and availability and access to treatment, despite the lack of clinical trials supporting the body of evidence for the use of these patches as monotherapy[20]. A 2012 study used a questionnaire of decreased quality of life by pain in patients who used 5% lidocaine patch. This questionnaire assesses well-being, sleep, pain, and emotional state, with a total of 40 points for effecting minimal impact on daily quality of life. At the end of 12 weeks of study, the score increased from 13.7 to 35.2[21].

Allodynia is a common LNP feature, and one of the most debilitating symptoms. Thus, the reduction in the area of allodynia that 5% lidocaine patch can produce is an impacting factor in improving quality of life. The purpose of its use is justified by the reduction of painful area, increasing tolerance to clothing contact[22].

Due to the short and long-term undesirable effects of opioids and gabapentinoids, such as sedation, constipation, and cognitive dysfunction[17,21], the use of topical treatments such as 5% lidocaine is of key interest for management of localized postoperative LNP.

In this series of case reports, the efficacy of 5% lidocaine patch use was evidenced, both in monotherapy and in multimodal approach, within the clinical context of LNP. It was observed that in all cases presented, the use of 5% lidocaine patch played a role in reducing the intensity (as measured by VAS) or even, in some cases, in the complete cessation of pain, besides having presented good tolerability by the patients, in accordance with the data described[14,16,17].

These results corroborate the positive effect of 5% lidocaine patch in the management of postoperative LNP, as reported in the literature on patients with LNP in the surgical scar or after thoracotomy[14,15]. Moreover, clinical evidence indicates the use of 5% lidocaine patch as first-line treatment of LNP[9,11,12], either as monotherapy or as part of a multimodal approach[22,23].

In addition to its analgesic efficacy, it is important to note that no systemic adverse reactions have been reported, according to safety and tolerability data published on the drug[24], since 5% lidocaine patch presents minimal risk of systemic absorption and pharmacological interactions[9].

All this has a great impact, especially in patients who are frail, seniors or on polypharmaceutical treatment, as well as in those who may not tolerate the effective therapeutic doses of systemic oral drugs indicated as first-line options for LNP treatment[9]. The management of postoperative LNP using 5% lidocaine patch, whether or not in association with other treatments, has been shown to be effective, with no impact on patient comfort or treatment tolerability.

CONCLUSION

The results of the cases presented in this study show that the management of postoperative LNP was adequate with the use of 5% lidocaine patch. In addition, it was possible to observe that its association with other treatments (pharmacological or not) proved effective, without negatively impacting treatment tolerability or patient comfort.

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AUTHORS' CONTRIBUTIONS

André Liggieri
Statistical Analysis, Funding Acquisition, Data Collection, Conceptualization, Resource Management, Project Management, Research, Methodology, Writing - Preparation of the Original, Software, Supervision, Validation, Visualization

Fabíola Minson
Statistical Analysis, Funding Acquisition, Data Collection, Conceptualization, Resource Management, Project Management, Research, Methodology, Writing - Preparation of the Original, Writing - Review and Editing, Software, Supervision, Validation, Visualization

Mariana Palladini
Statistical Analysis, Funding Acquisition, Data Collection, Conceptualization, Resource Management, Project Management, Research, Methodology, Writing - Preparation of the Original, Writing - Review and Editing, Software, Supervision, Validation, Visualization

Ethical Information

All data presented in this article were not identified to ensure patient confidentiality. Patients signed the Free and Informed Consent Term for anonymous use of clinical data.

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