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Monograph: Perioperative pain management in arthroscopy

Capsaicin 179 mg patch application technique

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ABSTRACT

Capsaicin is an agonist of the receptors implicated in neuropathic pain. Its topical application at high doses of 179 mg (8%) reduces the pain sensation. At present, a topical capsaicin 179 mg (8%) patch is available for the treatment of neuropathic pain either alone or in combination with other drugs. Following application, capsaicin is quickly released into the skin, reducing the neuropathic pain. The drug is intended for hospital administration and is both effective and safe.

A number of steps must be followed for correct application. Firstly, the application zone must be cleaned and well delimited with a cleansing gel. The previous application of topical anaesthetic or the administration of oral analgesia is optional. After trimming the patch, it should be applied for 60 minutes, avoiding the presence of air bubbles. After this time, the patch is carefully removed and a cleansing gel is applied. The most common adverse reactions are mild to moderate and of a local nature (erythema, itching and pain). Such discomfort usually subsides with local measures and analgesia. Subsequent clinical monitoring of the patient is required. If the clinical manifestations persist, another patch may be applied, if needed. The present practical article summarises the properties of the capsaicin patch, its safety profile and application.

Key words: Localised neuropathic pain. Allodynia. Hyperalgesia. Capsaicin.

RESUMEN

Técnica de aplicación del parche de capsaicina 179 mg

La capsaicina es un agonista de los receptores implicados en el dolor neuropático. Su aplicación tópica, a dosis elevadas de 179 mg (8%), disminuye la sensación dolorosa. Actualmente, se dispone de un parche de capsaicina tópica de 179 mg (8%) indicado para el tratamiento del dolor neuropático solo o en combinación con otros fármacos. Tras su aplicación se produce una rápida liberación de capsaicina en la piel que disminuye el dolor neuropático. Se trata de un fármaco de administración hospitalaria eficaz y seguro.

Para su correcta aplicación es necesario seguir una serie de pautas. En primer lugar, se ha de limpiar y delimitar con precisión la zona de aplicación con un gel limpiador. La aplicación previa de anestésico tópico o la administración de analgesia oral es opcional. Tras recortar el parche, este se debe aplicar, evitando la presencia de burbujas de aire, durante 60 minutos. Pasado este tiempo, se procede a su retirada con precaución y se aplica un gel limpiador. Las reacciones adversas más frecuentes son de tipo local, leves o moderadas, siendo las más frecuentes el eritema, el prurito y el dolor. Suelen mejorar con medidas locales y analgesia. Posteriormente, es necesario realizar un seguimiento clínico del paciente. En aquellos casos en los que persista la clínica, se podría realizar, si fuera preciso, otra aplicación del parche. En este artículo de aplicación práctica se resumen las propiedades del parche de capsaicina, su perfil de seguridad y sus normas de aplicación.

Palabras clave: Dolor neuropático localizado. Alodinia. Hiperalgesia. Capsaicina.

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Introduction

The management of localised neuropathic pain is complex. One of the therapeutic options used is the topical application of capsaicin at high doses of 179 mg (8%) in the form of a patch. The high local concentration of capsaicin produces desensitisation of transient receptor potential vanilloid subtype 1 (TRPV1), which reduces pain sensation.

What is capsaicin?

Capsaicin is a highly selective agonist of TRPV1, implicated in the modulation and transmission of the pain signal. This receptor predominates in the small nociceptive sensory neurons (C fibres and Aδ fibres) of the peripheral nervous system. Patients with peripheral neuropathic pain present an increased expression of this receptor.

Capsaicin produces "defunctionalisation" of TRPV1 through the influx of large calcium ion volumes in the receptor. If the receptor is stimulated repeatedly and for a prolonged period, both alterations of the intraneuronal osmotic forces and activation of calcium-sensitive proteases take place. These two phenomena induce transient degeneration of the epidermal nerve fibres, resulting in a decrease in localised neuropathic pain[1].

Capsaicin 179 mg (8%) patch

The capsaicin 179 mg (8%) patch produces rapid capsaicin release into the skin, thereby reducing neuropathic pain. Its use has been approved by both the United States Food and Drug Administration (FDA)[2] and the European Medicines Agency (EMA)[3], and the drug has been marketed in Spain since 2010[4]. Each patch measures 14 × 20 cm (280 cm^2) in size. The patch has an adhesive surface containing capsaicin 8%, and an outer reinforcement layer. The adhesive surface is covered by a transparent protective film layer with no markings of any kind and sectioned diagonally, and which is removed before application of the patch. The outer reinforcement layer is engraved with the text “capsaicin 8%”.

Indications of the treatment with capsaicin 179 mg (8%)

The patch is indicated for the treatment of primary peripheral neuropathic pain in adults, either alone or in combination with other drugs. It has also been approved for the treatment of peripheral neuropathic pain secondary to diabetic neuropathy and for pain of postoperative origin[5]. The treatment can be repeated every 90 days in the event of persistent or relapsing pain[4,6,7].

Efficacy and safety of the capsaicin patch

The efficacy and safety of the capsaicin patch have been validated in previous studies[5,8,9], and the product moreover complies with the requirements of the FDA[2] and the EMA for its approval[3].

The *ASCEND*[8] study demonstrated efficacy and rapid action in affording relief from the symptoms of peripheral neuropathic pain of different aetiologies, with a 37% decrease in pain versus baseline, and with a response lasting up to one year. The patients with a shorter duration of neuropathic pain showed comparatively better responses.

Tolerability has been demonstrated in a prospective study involving different indications in peripheral neuropathic pain[9], with an incidence of adverse effects at the site of application of 36.6% as the most common kind of problem, and no serious complications.

The data from these studies[8,9] suggest that the capsaicin 179 mg (8%) patch affords significant relief from peripheral neuropathic pain. In addition, such improvement is independent of patient age, the baseline pain score or the use of other coadjuvant drugs.

Administration of the capsaicin 179 mg (8%) patch

Precautions before administration

The patch is contraindicated in patients who are hypersensitive to the drug substance or to any of the excipients[4]. The skin in the application zone must be intact.

In patients with arterial hypertension or poorly controlled cardiovascular diseases, due assessment must be made of the risk of complications derived from the treatment, since the increase in pain related to application of the patch can give rise to a temporary increase in blood pressure (< 8 mmHg on average)[4].

Diabetic mellitus patients with distal sensory neuropathy or vascular insufficiency are at an increased risk of complications.

If the patient or the professional applying the patch experiences airway irritation after unintentional exposure to the medication, the avoidance of further exposure on the part of that individual should be considered.

Preparation of the environment and of the patient

Application should be carried out in a ventilated room with running water. Patient distraction (e.g., providing something to read) during administration is advisable.

The patient should be informed about the possible adverse effects, such as reactions at the application site, pain, burning sensation, erythema or itching. Decreased

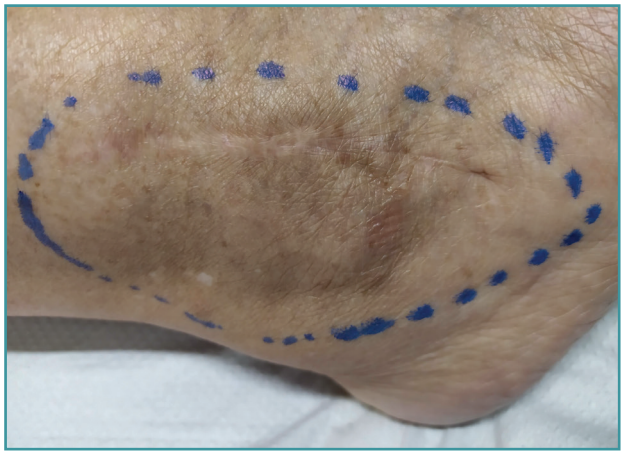

Figure 1. *Delimitation of the capsaicin patch application zone.*

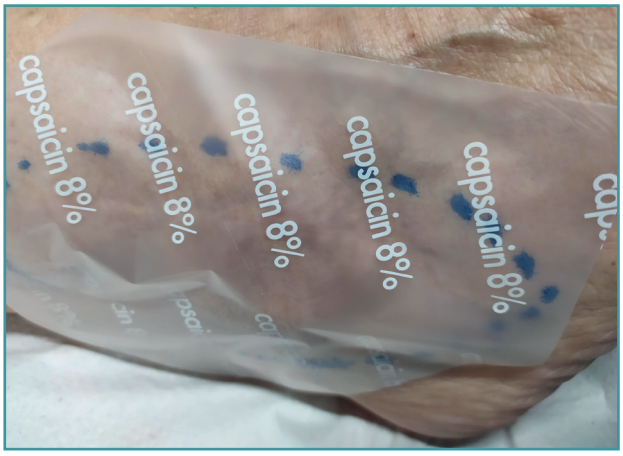

Figure 2. *Application of the capsaicin patch.*

sensitivity at the application site may be experienced after placing the patch, though this effect is reversible.

The treatment zone should be identified with a permanent ink marker **(Figure 1)**. This zone is then marked on the plastic patch protector, facilitating trimming of the patch surface to be used for treatment.

Topical anaesthesia may be previously applied to the treatment zone, and should be eliminated before placing the patch. Such application is optional and can be replaced by 50 mg of tramadol administered 30 minutes before placing the patch[10].

The skin must be completely clean and dry before application. A cleansing gel is supplied with the kit to facilitate this task. If the application zone is particularly hairy, prior shaving is advised in order to improve patch adherence.

Application of the capsaicin patch (Figure 2)

Nitrile gloves are to be worn at all times during patch manipulation prior to application, on applying the patch, and on removing the latter. It is advisable to wear a mask and protective goggles.

Trimming of the patch to fit the application zone should be carried out before application and without removing the protective film. Once trimmed, the patch can be applied.

The patch is slowly and progressively applied as the protective film is removed. Bubbles between the skin and patch should be avoided. Adherence of the patch to the skin can be facilitated by applying pressure to the zone or — if needed — dressings or bandages can even be used to envelop the treatment zone.

The duration of treatment is 60 minutes, except in the case of the feet, where treatment should be reduced to 30 minutes. The patch should not be applied to the face, above the hairline, or near mucous membranes.

In the event of symptoms indicative of airway irritation, the affected individual should leave the area where the patch has been applied, and adequate medical attention should be provided. This adverse effect is uncommon. In the event of contact with the mucous membranes or eyes, wash with abundant cold water.

If the patient experiences intense pain associated with the treatment, the patch is to be removed, with due evaluation of the presence of skin lesions consistent with chemical burns, since there have been reports or first- and second-degree burns[4].

Withdrawal of the patch

The patch is to be removed with protective measures (nitrile gloves, mask and goggles). Remove the patch slowly, rolling it onto itself inwards, and taking care to reduce contact. Once removed, the patch should be placed in a medical waste bag.

Once the patch has been removed, the zone is cleaned by applying the cleansing gel (butylhydroxyanisol at a concentration of 0.2 mg/g) supplied with the kit during a period of one minute. This gel allows elimination of all remaining capsaicin traces.

The gel is then removed and the area is washed with water, avoiding contact of the latter with the surrounding normal skin. Cold padding can be applied to the treated zone if the patient experiences pain at this time.

Adverse reactions

The studies carried out for approval of the capsaicin patch[2-4] evidence both good tolerance and a good safety profile. Most adverse reactions are mild to moderate and reversible, with an associated treatment dropout rate of 10.8%[9].

Many of the described adverse effects are referred to local problems at the application site, such as pain, erythema, itching, papules, blisters, oedema, dryness or burning sensation. As described above, another uncommon adverse effect is airway irritation.

Recommendations referred to patient follow-up

After completion of the treatment, the patient should be instructed to avoid touching the treated zone for 48 hours. The treated zone may present increased sensitivity to heat, hot water, direct sunlight or perspiration. The burning sensation can increase at night.

The application of local cold and the administration of oral analgesics are advised to reduce these symptoms. It is advisable to provide the patient with a contact number to obtain adequate care in the event of any problem related to the use of the patch.

A first follow-up visit after one week is recommended to assess possible adverse effects, symptoms improvement, reduction of the neuropathic pain area, and the use of coadjuvant medication. The second visit should take place approximately after one month to again assess therapeutic efficacy and consider a new treatment with the capsaicin patch, if necessary.

Supplementary material (Video 1)

The video accompanying this article and explaining the capsaicin 179 mg patch application technique can be seen.

https://fondoscience.s3.eu-west-1.amazonaws.com/fs-reaca-videos/reaca.29276.fs2111038-aplicacion-parche-capsaicina-179mg.mp4

Video 1. *Capsaicin 179 mg patch application technique.*

Ethical responsibilities

Conflicts of interest. The authors state that they have no conflicts of interest.

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Protection of people and animals. The authors declare that this research has not involved human or animal experimentation.

Data confidentiality. The authors declare that the protocols of their work centre referred to the publication of patient information have been followed.

Right to privacy and informed consent. The authors declare that no patient data appear in this article.

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