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# CASE REPORT

## COMPLEX REGIONAL PAIN SYNDROME - A CASE REPORT

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**ABSTRACT**

We present the case of a 68-year-old female patient, radio fracture in february 2018, for which she was hospitalized for a closed reduction with immobilization for 3 weeks. Patient referred Rehabilitation, with pain that began the day 2 weeks after removal of plaster for Colles fracture, the pain is oppressive on the back and palm of right hand, of intensity 8/10, presents allodynia, electrical discharges from fingers to forearm, constant tingling, denies burning, the pain intensifies to 10/10 intensity. The right upper extremity intact, hyprotrophy is observed in the forearm, back and palm of the hand, which is with erythema, smooth skin, with loss of hair in forearm compared to contralateral side, mobility arcs limited by pain, strength and reflexes are not explored, patient does not allow to evaluate, allodynia in C6, C7, C8, distal predominance (forearm and hand), good capillary refill. We diagnose complex regional type II pain syndrome and start treatment with tramadol. One week later he went to a brachial plexus block via the axillary with pain 8/10, blockade was performed with lidocaine 1% 60mg + Dexamethasone 8mg without complications. Go to review a day later with good response, pain 5/10, continue with tramadol. the blockade was made 2 more times each week, with a gradual decrease in intensity of pain 2/10 of burning type that is exacerbated when carrying out daily activities. Complex regional pain syndrome (CRPS) was defined in 1993 by the International Association for the Study of Pain (IASP) as one:"Variety of painful conditions of regional localization, after a lesion, presenting a distal predominance of abnormal symptoms, exceeding in magnitude and duration the expected clinical course of the initial incident, frequently causing significant motor deterioration, with a variable progression over time. " The diagnosis It is done by applying Budapest criteria by the IASP. The treatment are several therapeutic approaches among which we find medical and pharmacological treatment, psychological treatment, occupational therapy, rehabilitation treatment and more recently the treatment with spinal electrical stimulation. Although the therapeutic approach of CRPS requires a multidisciplinary approach, the most important thing is that the treatment be early, individual, progressive and painless.

## INTRODUCTION

Complex regional pain syndrome is a chronic pain condition characterized by autonomic and inflammatory features. It occurs acutely in about 7% of patients who have limb fractures, limb surgery, or other injuries. Many cases resolve within the first year, with a smaller subset progressing to the chronic form. This transition is often paralleled by a change from "warm complex regional pain syndrome," with inflammatory characteristics dominant, to "cold complex regional pain syndrome" in which autonomic features dominate. Multiple peripheral and central mechanisms seem to be involved, the relative contributions of which may differ between individuals and over time. Possible contributors include peripheral and central sensitization, autonomic changes and sympatho-afferent coupling, inflammatory and immune alterations, brain changes, and genetic and psychological factors. The syndrome is diagnosed purely on the basis of clinical signs and symptoms. Effective management of the chronic form of the syndrome is often challenging.

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## CASE REPORT

We present the case of a 68-year-old female patient from Mexico City, a housewife. She denies allergies, smoking or alcoholism, hysterectomy in 1984, radio fracture in february 2018, for which she was hospitalized for a closed reduction with immobilization for 3 weeks.

**Current condition:** Patient referred Rehabilitation Consultation, with pain that began the day 2 weeks after removal of plaster for Colles fracture, the pain is oppressive on the back and palm of right hand, of intensity 8/10, presents allodynia, electrical discharges from fingers to forearm, constant tingling, denies burning, the pain intensifies to 10/10 intensity, which radiates to the anterolateral side of the right arm, pain prevents sleep for more than an hour, refers to lost appetite, goes to rehabilitation at the suggestion of an orthopedist, who sends her to a pain clinic for assessment.

**Physical exploration:** Extremities: upper extremity integrated, Daniels scale strength 5/5 preserved tone, osteotendinous reflexes (bicipital, styloradial) present normal (++), right upper extremity intact, hyprotrophy is observed in the forearm, back

and palm of the hand, which is with erythema, smooth smooth skin, with loss of hair in forearm compared to contralateral side, mobility arcs limited by pain, strength and reflexes are not explored, patient does not allow to evaluate, allodynia in C6, C7, C8, distal predominance (forearm and hand), good capillary refill.

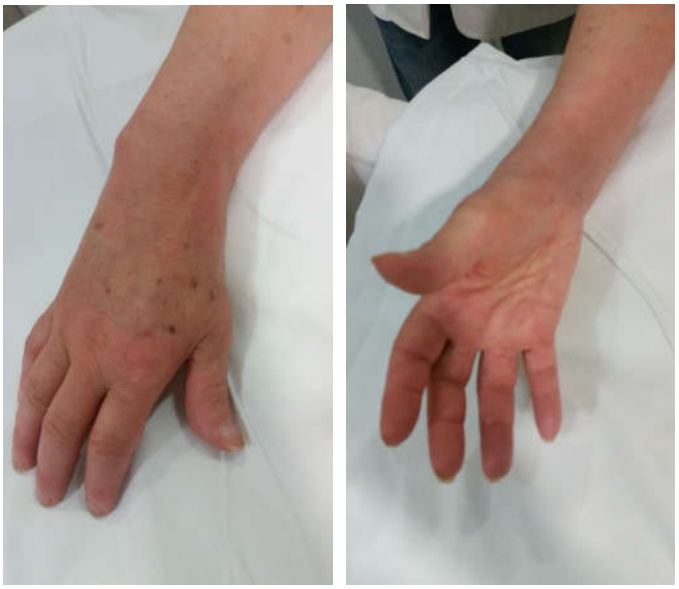

**Figure 1. Right hand in the first consultation with eritema, smooth and bright skin**

**Diagnostics**

- Neuropathic pain in right upper limb predominantly distal
- Complex regional type II pain syndrome

**Treatment**

- Tramadol 100mg / ml solution, 10 drops diluted in half a glass with water every 8 hours
- Protocol for axillary brachial plexus blockade.

One week later he went to a brachial plexus block via the axillary with pain 8/10, blockade was performed with lidocaine 1% 60mg + Dexamethasone 8mg without complications. Go to review a day later with good response, pain 5/10, continue with tramadol 10 drops every 8 hours. Two more brachial plexus blocks are carried out axillary each week with the same medication, with a gradual decrease in intensity of pain 2/10 of burning type that is exacerbated when carrying out daily activities. After the last continuous blockade with tramadol 10 drops every 8 hours and pregabalin 75mg every 12hrs. It is sent back to rehabilitation.

**Complex regional painful syndrome – Review:** Complex regional pain syndrome (CRPS) was defined in 1993 by the International Association for the Study of Pain (IASP) as one:"Variety of painful conditions of regional localization, after a lesion, presenting a distal predominance of abnormal symptoms, exceeding in magnitude and duration the expected clinical course of the initial incident, frequently causing significant motor deterioration, with a variable progression over time. "

**Classification**

Two types can be distinguished:

- Complex regional pain syndrome type I (CRPS I), formerly known as reflex sympathetic dystrophy or Sudeck.
- Type II (SDRC II) called years ago as causalgia.

Although the etiology is similar in both cases, in CRPS II it is essential that there is partial or total nerve damage.

**Physiology:** The initial lesion causes a painful impulse that reaches the central nervous system (CNS) and from there to the sympathetic nervous system, producing a vascular spasm that generates extravasation, edema and pain, thus initiating a vicious circle of edema and pain.

Clinically, the evolution is carried out in two stages:

- "Hot phase" pseudo-inflammatory or edematous
- "Cold phase" that presents with cutaneous fibrosis and amyotrophy, more or less associated with other trophic disorders.

However, its evolution is unpredictable, leading to significant functional deterioration and impairment of quality of life. [1]

There are 3 theories:

- Post-traumatic inflammation:

Substance P and PRGC.

- Peripheral vasomotor dysfunction.

Changes in vasoconstrictor neurons.

- Central sensitization.

Distorts or suppresses non-nociceptive sensations. The loss of inhibitory flow generated by normal cutaneous sensations in the affected limb enhances the excitability of the talamocortical nociceptive pathway.

**Characteristics**

- Duration of more than 3 months.
- It usually affects only one limb (an arm, leg, hand or foot) and usually begins after an injury.
- It is believed to be the result of damage or dysfunction of the central and peripheral nervous systems.
- It is characterized by prolonged or excessive pain, changes in skin color and temperature, and swelling in the affected area.[3]
- Changes in the texture of the skin in the affected area, being able to look bright and thin
- Abnormal pattern of sweat in the affected area or surrounding areas
- Changes in the growth patterns of nails and hair
- Rigidity in the affected joints
- Problems coordinating muscle movement, with less ability to move the affected part of the body
- Abnormal movement in the affected limb, most often with fixed abnormal posture (called dystonia), but also tremors or shaking of the limb (Hernández-Porras, 2017; Lin Goh *et al.,* 2017).

**Symptom**

- Key symptom: prolonged and severe pain that may be constant.
- Sometimes it is described as a feeling of "burning", "tingling".

- Irradiation to the entire arm or leg.
- In rare cases, the pain can be passed to the opposite extremity
- Allodynia.
- People with CRPS also have changes in temperature and skin color or swelling of the affected limb. ◊ abnormal microcirculation caused by damage to the nerves that control blood flow and temperature: the affected part may feel warmer or colder compared to the opposite extremity. The skin of the affected limb may become mottled or change color, becoming bluish, purple, pale or red (Lin Goh *et al.,* 2017).

**Diagnosis:** It is done by applying Budapest criteria by the IASP.

**Table 1. Budapest criteria for CRPS**

- Continuing pain, which is disproportionate to any inciting event.
- Must report at least one symptom in three of the four following categories:
  - Sensory: Reports of hyperalgesia and/or allodynia
  - Vasomotor: Reports of temperature asymmetry and/or skin color changes and/or color asymmetry
  - Sudomotor/Edema: Reports of edema and/or sweating changes and/or sweating asymmetry
  - Motor/Trophic: Reports of decreased range of motion and/or motor dysfunction (weakness, tremor, dystonia) and/or trophic changes (hair, nails, skin)
- Must display at least one sign at time of evaluation in two or more of the following categories:
  - Sensory: Evidence of hyperalgesia and/or allodynia
  - Vasomotor: Evidence of temperature asymmetry and/or skin color changes and/or asymmetry
  - Sudomotor/Edema: Evidence of edema and/or sweating changes and/or sweating asymmetry
  - Motor/Trophic: Evidence of decreased range of motion and/or motor dysfunction (weakness, tremor, dystonia) and or trophic changes (hair, nails, skin)
- There is no other diagnosis that better explains the symptoms and signs

Abbreviation: CRPS, complex regional pain syndrome.

**Treatment:** There are several therapeutic approaches among which we find medical and pharmacological treatment, psychological treatment, occupational therapy, rehabilitation treatment and more recently the treatment with spinal electrical stimulation. Although the therapeutic approach of CRPS requires a multidisciplinary approach, the most important thing is that the treatment be early, individual, progressive and painless.

In general, the strategies are:

- Medical and non-medical pain treatment
- Anti-inflammatory therapy
- Physiotherapy / occupational therapy / training therapy
- Psycho and sociotherapy in a context of multimodal treatment
- A limited number of sympathetic nerve blocks (Birklein Frank, 2017)

However, there is no firm evidence of efficacy in the CRPS for medicines used in other chronic neuropathic pain disorders. There is a moderate effect of pregabalin for allodynia. Tricyclic antidepressants may be used. If opioids are chosen, it is suggested that clear efficacy should be demonstrated. There may be a reduction in pain up to 3 months after intravenous ketamine administration, the use of continuous infusion for 4 days, maximum 30 mg / h for a 70 kg patient is described After the failure of non-invasive therapies, stimulation of the spinal cord (stimulation of the dorsal root ganglia) is recommended (Birklein Frank, 2017).

**Anti-inflammatory therapy:** High initial doses of oral glucocorticoids (100 mg of prednisolone per day) may be used, which are then reduced by 25 mg every 4 days. Bisphosphonates are drugs that are investigated for CRPS. Not only do they reduce the activity of osteoclasts, they also inhibit post-traumatic inflammation. Alendronate is administered orally at a high dose of 40 mg / day for 8 weeks or intravenously with a dose of 7.5 mg for 3 consecutive days. In the Netherlands, the application of 50% dimethyl sulfoxide as a fat-based cream 3 times a day on the affected limb is a standard procedure (Lin Goh *et al.,* 2017; Birklein Frank, 2017)

**Recommendations:** Strong recommendation for use as a first-line treatment in neuropathic pain for tricyclic antidepressants, selective inhibitors of serotonin and noradrenaline reuptake, pregabalin and gabapentin

- Weak, second line for lidocaine patches, high concentrations of capsaicin and tramadol.
- Weak, third line of strong opioids and botulinum toxin A (Finnerup *et al.,* 2015).

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