



JHT READ FOR CREDIT ARTICLE #539.

Case Report

## Management of long-term complex regional pain syndrome with allodynia: A case report



Isabelle Quintal OT<sup>a,b,c</sup>, Laurent Poiré-Hamel OT<sup>c</sup>, Daniel Bourbonnais OT, PhD<sup>a,b</sup>,  
Joseph-Omer Dyer PT, PhD<sup>a,\*</sup>

<sup>a</sup> School of Rehabilitation, Université de Montréal, Quebec, Canada

<sup>b</sup> Centre for Interdisciplinary Research in Rehabilitation of Greater Montreal (CRIR), Montreal, Quebec, Canada

<sup>c</sup> Centre Professionnel d'Ergothérapie, Montreal, Quebec, Canada

### ARTICLE INFO

#### Article history:

Received 28 November 2017

Received in revised form

16 January 2018

Accepted 22 January 2018

#### Keywords:

Allodynia

Complex regional pain syndrome

Somatosensory rehabilitation

Graded motor imagery

Hand therapy

### ABSTRACT

*Study design:* Case report.

*Introduction:* Conventional rehabilitation alone may not be effective in reducing symptoms in some patients with complex regional pain syndrome.

*Purpose of the study:* This case report portrays the benefits of a new tailored rehabilitation program for a 39-year-old patient suffering from upper limb complex regional pain syndrome with severe touch-evoked pain (static mechanical allodynia).

*Methods:* This patient had previously received conventional rehabilitation for a year and a half including physical and nonsurgical medical interventions that did not improve symptoms or function. In the search for an alternative, this patient was referred to occupational therapy to try a tailored rehabilitation program, drawing on multiple strategies used sequentially according to the patient's tolerance and symptom evolution. During this 22-month program, the following methods were added (listed chronologically): somatosensory rehabilitation of pain method, graded motor imagery, pain management modalities, active mobilizations, strengthening exercises, and task simulation. The patient successively showed resolution of mechanical allodynia, decreased pain, reduction of tactile hypesthesia and improvement in active range of motion, strength, and function. These improvements allowed him to return to work.

*Discussion:* This suggests that a tailored rehabilitation program combining somatosensory rehabilitation of pain method, graded motor imagery and more conventional approaches could improve symptoms and functional status in patients with upper limb complex regional pain syndrome, even with persistent refractory symptoms.

*Conclusion:* The addition of the somatosensory rehabilitation of pain method and the graded motor imagery approach to conventional therapy could be considered in cases of complex regional pain syndrome that do not respond to conventional rehabilitation alone.

© 2018 Hanley & Belfus, an imprint of Elsevier Inc. All rights reserved.

### Introduction

Complex regional pain syndrome (CRPS) incidence varies between 5 and 26 cases per 100,000 per year,<sup>1</sup> and is seen twice as often with the upper limb as with the lower limb.<sup>2</sup> It is characterized by the presence of regional painful symptoms, seemingly

Conflict of interest: All named authors hereby declare that they have no conflicts of interest to disclose.

\* Corresponding author. School of Rehabilitation, Faculty of Medicine, Université de Montréal, P.O. Box 6128, Station Centre-Ville, Montreal, Quebec, H3C 3J7, Canada. Tel.: +1 514 343 6111x18220; fax: +1 514 343 6929.

E-mail address: [joseph.omer.dyer@umontreal.ca](mailto:joseph.omer.dyer@umontreal.ca) (J.-O. Dyer).

disproportionate, associated with sensory, motor, sudomotor, vasomotor edema, and/or trophic signs.<sup>3</sup> Those impairments can severely affect the function of the upper limb.<sup>4</sup> Evidence suggests that people with upper limb CRPS suffers longer than those with lower limb CRPS.<sup>5</sup> About two-thirds of patients with CRPS continue to show substantial limitations of their independence 1 year after the onset of symptoms.<sup>5–9</sup>

Patients with CRPS often have significant somatosensory symptoms.<sup>10,11</sup> Among these symptoms, abnormal painful sensations such as hyperalgesia and allodynia, as well as skin sensibility disorders, are often the leading cause of complaints and decreased function.<sup>12,13</sup> Hyperalgesia refers to increased pain due to a painful stimulus,<sup>14</sup> whereas allodynia is pain evoked by a normally painless

stimulation.<sup>15</sup> The term “allodynia” encompasses several forms, including thermal allodynia evoked by heat or cold and mechanical allodynia evoked by static or dynamic touching. Hyperalgesia and allodynia are seen twice as frequently in CRPS than in other pathological conditions affecting the upper limb, such as neuropathic conditions and discrete musculoskeletal entities (e.g. osteoarthritis, rotator cuff disease, frozen shoulder, or healing fracture).<sup>14,16</sup> Allodynia has been reported in 74% of patients presenting with CRPS.<sup>17</sup>

The neurophysiological mechanisms responsible for painful symptoms in CRPS are not fully understood. Evidence suggests that in both types of CRPS, without (CRPS type I) and with nerve damage (CRPS type II), it is possible to observe neuropathic pain that is attributable to somatosensory impairments.<sup>18–20</sup> There is also evidence that these somatosensory impairments may contribute to the development of painful symptoms via peripheral and central sensitization mechanisms in CRPS.<sup>21,22</sup> For example, it is possible to observe reorganization in the primary somatosensory cortex (S1) that would be associated with sensitization mechanisms contributing to painful symptoms in these patients.<sup>23</sup>

Since peripheral and central sensitization mechanisms<sup>24</sup> might contribute to pain chronicization in CRPS,<sup>7</sup> interventions that seek to regulate these mechanisms may be helpful in preventing such chronicization. The somatosensory rehabilitation of pain method (SRM) described by Spicher<sup>25</sup> and graded motor imagery (GMI)<sup>26</sup> are two innovative approaches that could potentially target these mechanisms. SRM uses peripheral somatosensory stimulation that can potentially act on peripheral sensitization mechanisms. Moreover, this method does not require active movement, which can be an interesting asset in individuals in whom active mobilization can exacerbate symptoms. SRM consists of avoiding or reducing any cutaneous stimulation as much as possible in the skin area where touch evokes pain (i.e. allodynic area), while stimulating the somatosensory system at a distant site (with a soft fabric or light mechanical vibration in a comfortable territory proximal to the allodynic area). The SRM approach contrasts with that of the conventional desensitization approach, which promotes stimulation of the allodynic area with stimulations that are initially mild and then stronger as the person becomes accustomed to them and feels less pain.<sup>27</sup> Evidence shows that SRM can reduce static mechanical allodynia (SMA) in patients with neuropathic pain.<sup>25,28–30</sup> A retrospective case series on SRM showed a significant decrease in pain among burn survivors with SMA.<sup>29</sup> Recently, a retrospective case series showed a reduction in the severity of SMA following SRM in patients with upper limb CRPS.<sup>30</sup>

Conversely, GMI uses sensorimotor integration processes to reduce central sensitization and integrates the progression of active movements in its advanced stages. GMI is a hierarchical rehabilitation method in which patients must perform increasingly demanding tasks to create new neural connections targeted at normalizing the representation of the affected body part in the primary somatosensory cortex. GMI involves three stages of rehabilitation progression: (1) left/right discrimination, (2) explicit motor imagery, and (3) mirror therapy.<sup>31</sup> Evidence shows that GMI alone can have beneficial effects in chronic pain conditions<sup>32</sup> and CRPS.<sup>33–35</sup> Therapies that preserve the integrity of the cortical somatosensory representation of body parts affected by CRPS may reduce pain symptoms in these patients.<sup>36</sup> The beneficial effects of GMI in CRPS could be explained by its ability to regulate cortical reorganization mechanisms involved in CRPS painful symptoms.

Although CRPS can be treated with medication and conventional physical therapy, these therapeutic approaches do not always reduce pain and improve function satisfactorily.<sup>33</sup> Currently, more evidence is needed for existing CRPS clinical guidelines.<sup>33,37</sup> There is still a need to develop new mechanism-based treatment approaches to achieve better results in the treatment of pain and

somatosensory symptoms in CRPS.<sup>38</sup> SRM and GMI are two different mechanism-based intervention approaches that may be potentially used in combination or as a complement to conventional rehabilitation (pain management modalities, active mobilizations, strengthening exercises, and task simulation) to treat CRPS. In the present case, this combination was used for a patient who did not respond to conventional rehabilitation alone.

## Patient description

Mr. B, a left-handed 39-year-old sub-Saharan African living in Quebec, Canada, was diagnosed in October 2012 with CRPS affecting his right upper limb. This condition resulted from a work-related accident that occurred in August 2012 while he was a plant production worker. During this accident, Mr. B sustained a right wrist injury involving ligament tears (triangular fibrocartilage complex and scapholunate ligaments). A few days after the injury and until December 2013, Mr. B received conventional treatments, including physical rehabilitation (conventional desensitization approach, contrast baths, passive mobilizations, active mobility, and strengthening exercises), prescribed medications (pregabalin and celecoxib), and pain management medical interventions (several stellate ganglion and venous blocks) without any subjective improvement. Due to the lack of improvement in his condition, he was referred by his plastic surgeon for occupational therapy at our private clinic to try a new rehabilitation approach.

## Initial clinical examination

On his first visit to the occupational therapist in February 2014, Mr. B complained of intolerable pain in his entire right upper limb that was causing severe limitations and a fear of using his arm. He kept his hand held protectively against his trunk. On visual inspection, his affected hand looked waxy, swollen, and atrophied compared to his other hand. The pain was located on the dorsal side of his hand and thumb. It increased when he used his hand or when it was slightly touched (not able to tolerate any covering) or exposed to cold. He described his symptoms as follows: feeling of constant numbness, intermittent burning sensations, and shooting pain up to his right shoulder. With regard to hand function, he reported being unable to move the entire arm from shoulder to fingers because of the pain. He could not use his right hand for any daily living activities. The only possible active limited motions were those of the index and thumb. He could use a pinch grasp with his index/thumb to hold light objects (eg, paper, fork, and so on) for no more than a few seconds because of the pain. He also complained of lack of strength and endurance in the affected hand. He was very emotional when he spoke about his accident or his condition. The mere act of talking about his arm was enough to trigger signs of emotional distress. Living with this pain was a great source of emotional burden to him. He felt unable to think of anything but this pain, unable to plan new projects. At the end of the first meeting with the occupational therapist, he reported being deeply discouraged, that he had no hope of healing to the point of wondering why he continued to seek treatment.

## Methodology

### General organization of patient's care

The patient was invited to participate in a tailored rehabilitation program which consisted of two components: (1) rehabilitation sessions supervised by an occupational therapist at the clinic (30 to 60 minutes in duration) and (2) home sessions managed by the patient. Rehabilitation sessions at the clinic and at home included

Download English Version:

<https://daneshyari.com/en/article/8589984>

Download Persian Version:

<https://daneshyari.com/article/8589984>

[Daneshyari.com](https://daneshyari.com)