Scandinavian Journal of Pain 4 (2013) 200–207

Contents lists available at ScienceDirect

Scandinavian Journal of Pain

journal homepage: www.ScandinavianJournalPain.com

Topical review

Mirror therapy for Complex Regional Pain Syndrome (CRPS)—A literature review and an illustrative case report

Samaa Al Sayegh[a], Tove Filén[b], Mats Johansson[c], Susanne Sandström[d], Gisela Stiewe[e], Stephen Butler[f,*]

[a] Department of Dental Medicine, Karolinska Institute, Huddinge, Sweden
[b] Pain Center, Academic Hospital of Uppsala, Sweden
[c] Falu lasarett, Falun, Sweden
[d] Physiotherapy Department and Pain Clinic, Karolinska University Hospital, Stockholm, Sweden
[e] Fysiocenter, Odenplan, Stockholm, Sweden
[f] Pain Center, Department of Anesthesia and Intensive Care, Akademiska sjukhuset, Uppsala, Sweden

HIGHLIGHTS

- A patient with long-standing CRPS of the lower extremity, improved with mirror therapy.
- Review of CRPS signs and symptoms and the now accepted diagnostic criteria.
- Review of mirror therapy for pain and rehabilitation of CRPS, phantom limb, and stroke.
- Review and evaluation of the published literature for mirror document effects in good quality studies.

ARTICLE INFO

Article history:
Received 13 May 2013
Received in revised form 5 June 2013
Accepted 6 June 2013

Keywords:
Complex Regional Pain Syndrome (CRPS)
Mirror therapy
Multidisciplinary rehabilitation
Phantom limb pain
Post stroke pain

ABSTRACT

Background and purpose: This case of a 42 year old woman with lower extremity Complex Regional Pain Syndrome (CRPS) after a twisting injury of the ankle, effectively treated with the addition of mirror therapy to a rehabilitation programme, prompted a literature review of both CRPS and mirror therapy. Mirror therapy is a newer adjunct to other forms of pain control and functional restoration for treatment of CRPS as well as other difficult clinical problems. This was a required group project as part of a university based course in chronic pain for healthcare workers.

Materials and methods: The PubMed database up to September 26, 2012 was reviewed using four search word groups: "CRPS mirror therapy", "mirror CRPS", "reflex sympathetic dystrophy OR Complex Regional Pain Syndrome AND mirror" and "reflex sympathetic dystrophy OR Complex Regional Pain Syndrome AND mirror + RCT". Nine studies from PubMed met the criteria that this working group had chosen for inclusion in the analysis of mirror therapy as treatment. These references were supplemented by others on CRPS in order to generate an adequate review of both the syndrome CRPS and mirror therapy itself. Some references were specific for mirror therapy in the treatment of CRPS but others described mirror therapy for the treatment of phantom limb pain, brachial plexus avulsion pain, for physical rehabilitation of stroke related paresis and for rehabilitation after hand surgery.

Results: Criteria for the diagnosis of CRPS including the International Association for the Study of Pain criteria and the Budapest criteria are reviewed with an emphasis on the specificity and sensitivity of the various criteria for clinical and research purposes. The signs and symptoms of CRPS are a part of the criteria review.

The main treatment strategy for CRPS is physical rehabilitation for return of function and mirror therapy is one of many possible strategies to aid in this goal.

The patient in this case report had failed many of the adjunctive therapies and rehabilitation had been unsuccessful until the addition of mirror therapy. She then could progress with physical rehabilitation and return to a more normal life. Mirror therapy techniques are briefly described as part of a discussion of its success with relationship to signs and symptoms as well as to the duration of CRPS (and other

DOI of refers to article: http://dx.doi.org/10.1016/j.sjpain.2013.07.019.
* Corresponding author at: Pain Center, Akademiska sjukhuset, 751 85 Uppsala, Sweden. Tel.: +46 18 6112945; fax: +46 18 503539.
E-mail addresses: stephen.butler@akademiska.se, stevmarg@telia.com (S. Butler).

http://dx.doi.org/10.1016/j.sjpain.2013.06.002

syndromes). Some discussion of the theories of the central effects of both CRPS and phantom limb pain and how these are affected by mirror therapy is included.
An analysis of the 9 most relevant articles plus a critique of each is present in table form for review.
Conclusions: There appears to be a clear indication for the use of mirror therapy to be included in the multidisciplinary treatment of CRPS types 1 and 2 with a positive effect on both pain and motor function. There is also evidence that mirror therapy can be helpful in other painful conditions such as post stroke pain and phantom limb pain.
Implications: CRPS is often overlooked as an explanation for obscure pain problems. Prompt diagnosis is essential for effective treatment. Mirror therapy is a newer technique, easy to perform and can be a useful adjunct to aid physical rehabilitation and decrease pain in this population. Much further prospective research on mirror therapy in CRPS is ongoing and is needed to systematize the technique, to clarify the effects and to define the place of this therapy in the multidisciplinary management of CRPS.

Contents

1. Introduction

Complex Regional Pain Syndrome (CRPS) is a relatively rare form of chronic pain that involves the extremities primarily. After learning about the patient (referred to as "Anna" here) described below, the authors became interested in this problem and also the therapy that Anna received. This review begins with a case presentation, then a description of the syndrome CRPS and its diagnosis and ultimately, an evaluation of the medical literature concerning mirror therapy for chronic pain.

2. Case description

The local ethics committee does not require prior approval of anonymous case report-publications. The patient gave her consent to her pain problem being described anonymously in this case report.

The patient, Anna, is a 42 year old female who has suffered since childhood from back pain. She later developed an abdominal pain diagnosed as "neuropathic" following a laparoscopy and subsequently a facial pain problem diagnosed as "neuropathic" following nasal septum surgery. Anna has an evident predilection for pain problems following trauma and these have been classified as "neuropathic".

In 2001 Anna twisted her right ankle and foot suffering a rupture of a small muscle to the first toe and then developed a tarsal tunnel syndrome. Despite frequent contact with the healthcare system for pain, Anna did not have appropriate investigation and diagnosis until 3.5 years after the injury. During that time she developed CRPS signs and symptoms in the right lower extremity.

When seen in the Pain Clinic in Falun Hospital, Sweden in 2006, Anna presented on crutches with a swollen, painful foot with alternating periods of pale or of purplish blue skin discoloration. Course hair growth and thickened skin were described. Anna had restricted range of motion of the ankle and foot joints with allodynia to touch and hyperalgesia over the whole foot and lower leg.

Anna had been previously active socially and also physically as an aerobics instructor, but after the ankle injury in 2001 she had a very restricted lifestyle with minimal social and physical activity and a fear of anything or anyone coming in contact with her right foot.

In Falun, Anna had trials of high dose opioids, neuroleptics, and antidepressive medications. She also had trials of ketamine infusions but all with little effect. Spinal cord stimulation was considered but not tried for fear of producing a local pain problem at the insertion site and/or implantation site for the generator due to her previous responses to trauma.

In 2010, Anna was referred to the Pain Center at the Uppsala Academic Hospital, Sweden for evaluation and treatment. She subsequently was admitted for a three week multidisciplinary treatment programme. At discharge, Anna had begun weight bearing on the right foot, took part in water gymnastics and had decreased her use of pain medications. Anna attributes this mostly to the beneficial effects of mirror therapy. She now has full weight