

# Chinese Scalp Acupuncture Relieves Pain and Restores Function in Complex Regional Pain Syndrome

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**ABSTRACT** Complex Regional Pain Syndrome (CRPS) can result from trauma or after surgery. It is often difficult to manage effectively. If not recognized early, it can result in significant debilitation. Symptoms attributed to CRPS include neuropathic pain, allodynia, sudomotor changes, and decreased range of motion. It can occur with (Type II) or without (Type I) nerve injury. A number of soldiers sustaining extremity injuries during combat have manifested these symptoms. Two subjects were diagnosed with CRPS after sustaining upper extremity injuries during military operations. After failing conservative treatment, Chinese Scalp Acupuncture (CSA) was used once to twice a week for 1 to 4 weeks. CSA resulted in improvement in the pain visual analog scale or numeric rating scale by over 80% in two soldiers with upper extremity CRPS. Additionally, decreased sensory changes and improved function were noted on exam and therapy assessments. Notably, the pain reduction, functional improvement, and normalization of sensation have been fully maintained between treatments. The treatment response had been sustained at 20-month follow-up with no recurrence. CSA provided lasting pain reduction, and improved function and sensation in this group of combatants with upper extremity CRPS.

## INTRODUCTION

Complex Regional Pain Syndrome (CRPS) can result from trauma or after surgery and can cause severe dysfunction and extreme debilitation. Symptoms include neuropathic pain, allodynia, sudomotor changes, and decreased range of motion (ROM). It can occur with (CRPS Type II) or without (CRPS Type I) nerve injury.<sup>1</sup> Recalcitrant to conventional treatment, it is often very difficult to manage. Standard treatment includes medications and conservative treatment.<sup>1</sup> Pain is typically managed with tricyclic antidepressants, anticonvulsant medications, desensitization, and aggressive physical therapy to maintain ROM. Sympathetic ganglion blocks are used as a diagnostic tool and may improve symptoms for the duration of the block. Finally, if these modalities fail, spinal cord stimulation has held some promise for treatment.<sup>2</sup> However, because of the risk and cost of this invasive procedure, it should be reserved for only the most severe cases.<sup>2</sup> A number of deployed soldiers sustaining upper extremity injuries have developed CRPS. We present a case series of two patients selected out of a group of fourteen consecutive patients that were successfully treated for CRPS or severe scar allodynia with Chinese Scalp Acupuncture (CSA). The fourteen patients were presented in a poster at the 2009 American Academy of Pain Medicine Annual Meeting.

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CSA is a neuroanatomic acupuncture approach. The treatment is based on the pain location. Patients with allodynia or hyperesthesia are treated by inserting needles into the scalp in the area overlying the portion of the sensory homunculus that correlates with the painful area. In addition, needles may be inserted into the foot-motor sensory area (Fig. 1). Needles may need to be inserted bilaterally.<sup>3</sup> Once inserted, the needles are rotated, back and forth, approximately a quarter turn between the distal joints of the thumb and forefinger at a frequency of at least 200 times per minute for 1 to 3 minutes. This is repeated approximately every 10 minutes for a total of 20 to 30 minutes. Ideally, treatment should be repeated two to three times weekly for 3 to 4 weeks.<sup>3</sup>

## METHODS

Two soldiers were diagnosed with CRPS after sustaining upper extremity injuries. After failing aggressive medication management and occupational therapy, CSA was utilized once to twice weekly for 1 to 4 weeks using Seirin Type L, 40 mm × 0.25 acupuncture needles (SEIRIN-America, Weymouth, Massachusetts). Pain was evaluated using the visual analog scale (VAS) or numeric rating scale (NRS).

## CASES

### *Patient No. 1*

A 31-year-old Army male suffered a gunshot wound in Iraq resulting in a right shoulder open fracture. After multiple debridements, he underwent a hemiarthroplasty. After 6 months of little change with conservative therapy and multiple medications, the hemiarthroplasty was removed and an arthrodesis was performed. Six months later, he had a right shoulder revision with no relief of his pain or increase in function. He was then evaluated in the Physical Medicine service.

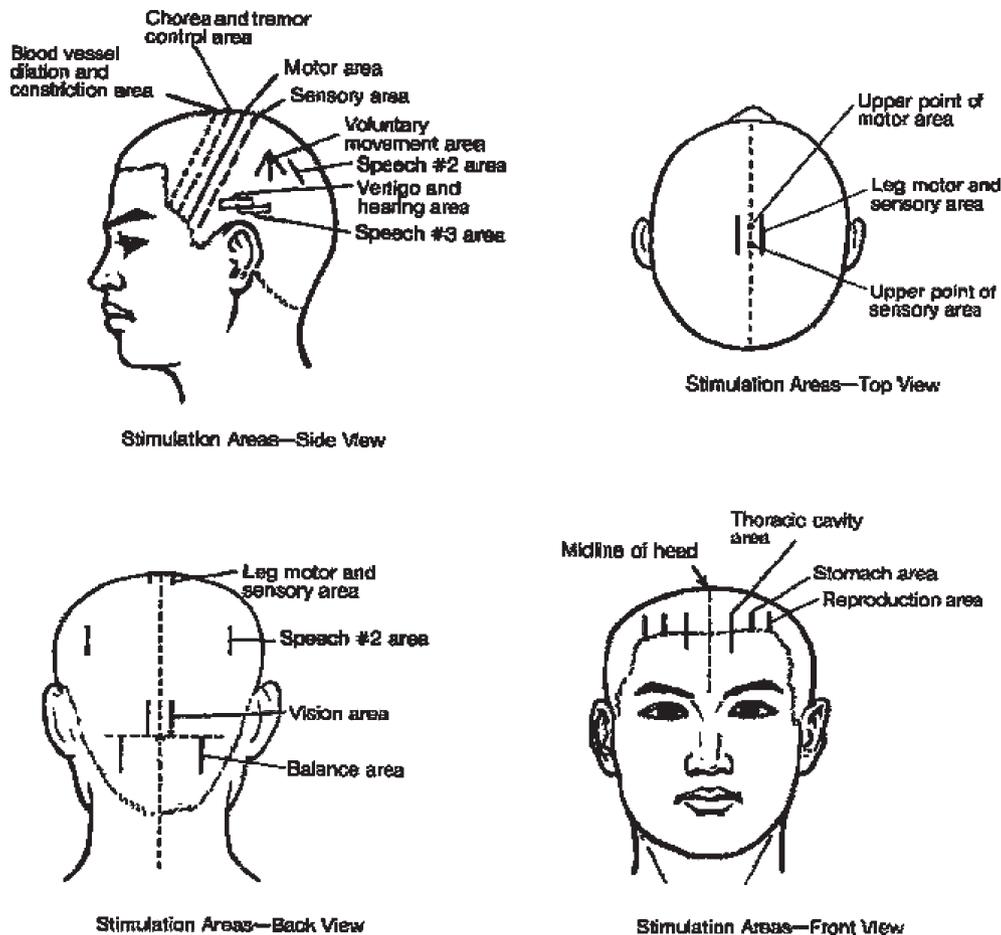


FIGURE 1. CSA treatment areas.

His presentation was significant for right arm and thorax color changes, temperature changes, and severe allodynia. He was diagnosed with CRPS of the right arm and thorax. He was treated with CSA in the middle 2/5ths of the left sensory treatment area. Immediately post-treatment, he had an 80% to 90% improvement in the arm and shoulder allodynia. In addition, he had improved elbow and wrist ROM with very little pain. Three days later, he was treated again resulting in complete resolution of the allodynia. Twenty months after the scalp acupuncture treatment, the CRPS symptoms had not recurred.

**Patient No. 2**

In early 2007, an 18-year-old active duty male tripped and fell onto his outstretched left hand in Iraq. He immediately complained of the thumb dislocating when he fell. Radiographs demonstrated a fracture at the base of the first proximal phalanx. The next day he had an open reduction and internal fixation. Over the following 6 months, he complained of pain and extensor pollicis longus tendon (EPL) subluxation. As a result, he had an EPL stabilization approximately 9 months after his initial injury. Six weeks after surgery, he was diag-

nosed with CRPS by his orthopedic surgeon. During the next 8 months, he went through conservative treatment with multiple anticonvulsant medications, fluidotherapy, and desensitization with no improvement.

He was seen by the Physical Medicine service about 10 months after the EPL stabilization. Examination revealed that the affected area included the hand and the distal two-thirds of the left arm. The arm had developed hyperesthesia, allodynia, and a mottled appearance. He held his hand in a claw position with noticeable intrinsic atrophy. The left hand was colder than the right hand. After evaluation, he received CSA in the middle 2/5th of the sensory treatment area bilaterally. During this treatment, he experienced resolution of allodynia over the ulnar two fingers and hand and there was visible improvement in the color and temperature of the limb, as well as improved strength and finger ROM. Two days later, he was treated again with a 15% to 20% reduction in allodynia of the radial half of the hand. The third treatment, 3 days later, using only a right-sided needle, relieved his allodynia completely except over the surgical scar. One week later, the same treatment completely relieved the pain, color, and temperature changes. The only remaining pain was the orthopedic pain associated with his original injury. Sixteen months

**TABLE I.** Pretreatment and Post-treatment Pain Scores

Patient Number	Injury Site	Needle Location	Initial Pain	Post Pain	No. of Treatments
1 <sup>a</sup>	Right Shoulder and Arm	Left Middle 2/5 Sensory, Left Foot Motor Sensory	10	0	2
2	Left Ring Finger	Left Middle 2/5 Sensory	9	0	1
3	Left Hand and Wrist	Right Middle 2/5 Sensory	8	1	1
4	Right Index Finger	Right Middle 2/5 Sensory	5 (9/10 HA)	0 (No HA)	2
5	Right Ring Finger	Left Middle 2/5 Sensory	6	0	2
6	Left Arm/Shoulder	B Middle 2/5 Sensory, Left Foot Motor Sensory	7	0	3
7 <sup>a</sup>	Left Proximal Palmar Hand and Wrist	B Middle 2/5 Sensory	6	1	4
8	Right Middle Finger	Left Middle 2/5 Sensory, Left Foot Motor Sensory	9	0	4
9	Left Radial Hand, Wrist, Proximal Forearm	Left Middle 2/5 Sensory, Left Foot Motor Sensory	7	1	2
10	Left Wrist and Hand	Right Middle 2/5 Sensory	8	1	2
11	Right Wrist	B Middle 2/5 Sensory, B Foot Motor Sensory	7	0	7
12	Left Elbow	Right Middle 2/5 Sensory	6	0	2
13	Left Hand and Wrist	Right Middle 2/5 Sensory	8	0	4
14	Right Hand and Wrist	Left Middle 2/5 Sensory, Left Foot Motor Sensory	6	1	3

<sup>a</sup>Representative cases.

after his last treatment, he had had no recurrence of the CRPS symptoms.

## DISCUSSION

Acupuncture was first introduced into the conscience of the United States in 1972 by James Reston when, serving as a New York Times correspondent during President Nixon's trip to China, he reported on his postoperative pain relief with traditional Chinese acupuncture after an emergency appendectomy. In 1997, the National Institutes of Health published a consensus statement delineating its efficacy in several conditions, including chemotherapy nausea and, possibly, back pain. As noted in the consensus statement, low-level anecdotal evidence, such as this case series, and poorly designed research protocols supportive of acupuncture's efficacy in internal medicine, neurologic, pain, and other disorders is abundant.<sup>4</sup> Acupuncture, despite the NIH support, has not gained widespread acceptance as a treatment modality in the United States.<sup>5,6</sup> High-level evidence-based support, as is the case with many other pain treatment modalities, has remained difficult to achieve.<sup>7</sup> When one evaluates the different systems of acupuncture, it becomes difficult to assess what is, and what is not, an acupuncture point. The mere placement of a needle in the body has a physiologic effect.<sup>7</sup> In addition, pain is a subjective experience with a somatic and affective component.<sup>8</sup> Therefore, it can be difficult to assess the efficacy of any pain treatment. Delving deeply into the challenges facing those attempting to create high level evidence for acupuncture is well beyond the scope of this manuscript. The preceding discussion serves as an introduction to this complex issue.

CSA, developed by Dr. Jiao Shunfa, is an acupuncture technique combining traditional needling methods with knowledge of the neuroanatomy.<sup>3</sup> Very little is known about the mechanism of action of CSA. In the Chinese medical literature it is cited, primarily, for the treatment of stroke.<sup>9</sup>

A Medline and Google Scholar search did not return any publications in which CSA was used to treat CRPS. One can hypothesize that it, through an unknown mechanism, affects the central component of CRPS. However, even the existence of this "central pain" in CRPS is debated and poorly understood. Although the mechanism of action is unknown and may be difficult to fathom, the results in these cases show that there is a new, low cost, low-risk method that warrants consideration when treating CRPS.

## CONCLUSION

CSA resulted in improvement in the pain VAS or NRS by more than 80% in two soldiers with upper extremity CRPS (Table I). Additionally, decreased sensory changes and improved extremity function were noted on physical exam and therapy assessments. Notably, the pain reduction, functional improvement, and sensory normalization were fully maintained between treatments. To date, the treatment response has been sustained for as much as 20 months with no return of allodynia or decrement in function. This is a small case series that shows promise. Prospective randomized trials should be conducted to evaluate for the placebo effect and to evaluate the efficacy of this treatment.

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*Case Report*

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