Dynamic Chiropractic

MUSCULOSKELETAL PAIN

Reflex Sympathetic Dystrophy Syndrome: A Chiropractic Perspective

Edgar Romero, DC, DACNB

Reflex sympathetic dystrophy (RSD) syndrome, or complex regional pain syndrome, as it is now called, is, as the latter name implies, a complex series of symptoms that plagues many a patient. It is most commonly associated with pain/sensory abnormalities, vasomotor dysfunction, edema/sudomotor dysfunction, and motor/trophic changes.[1] Some or all of these signs may be present with a diagnosis of RSD.

Research has shown that the predisposing factor for the condition generally lies in a peripheral nerve injury or some other injury that activates nociception at a high level, and can increase sensitization in the central nervous system.[2] The pain can be in one limb or can progress to encompass the entire body. There is no psychological component to RSD, but many patients are severely depressed because of the constant pain, lack of sleep, and total disruption of lifestyle that occurs with the condition.[2] It has been determined through further studies into this devastating condition that the etiology is in fact central, subsequent to the peripheral lesions that initiate the syndrome.[3]

According to the current medical model, physical therapy is the cornerstone of first-line treatment, with moderate cases requiring adjunctive analgesics, such as anticonvulsants and/or antidepressants. Use of opiods is not uncommon for those in too much pain to participate in physical therapy. For severe cases, anesthetic blockade, sympathetic/somatic blockades, spinal cord stimulation and spinal analgesia are all part of the treatments provided.[4]

A possible etiology of this pathology from a neurological point of view will be explained in this paper, with the proper treatment, including chiropractic, based on signs and symptoms. As stated previously, RSD is in many cases precipitated by some trauma or peripheral nerve injury that progresses over time to the syndrome, with associated pain and dysfunction. It must be assumed that the increased frequency of firing of the pain pathways has the effect of starting the imbalance that leads to RSD.

Nociceptive pathways have collaterals into the intermediolateral cell column (IML) of the spinal cord, which also happens to be the primary neuron of the sympathetic system. As a vasomotor component is one of the chief diagnostic indicators of the condition, one must assume that this pain barrage may be part of the initial syndrome. If this were the only factor, however, anyone who had ever been injured and felt pain would have at least some diagnostic indicators of RSD.

Although we all do experience a localized inflammatory response secondary to central vasoconstriction and peripheral dilation associated with increased sympathetic response after an injury, it is of course not to a degree that RSD would develop. Nociception does not in fact end at the spinal cord, obviously. It has rostral synapses, some of which proceed through the thalamus to the parietal cortex and consciousness. The greater numbers by far, however (76 percent, by some estimates), have collaterals that synapse in the reticular formation of the mesencephalon and the

pons. The mesencephalic (or rostral) reticular formation has an excitatory effect on the cortex to increase perception. Thus, not only will a patient have difficulty sleeping secondary to an increased firing cortex, but the very perception of pain itself will also seem greater to the patient, even in the absence of continued nociception.

More importantly, the rostral reticular formation has an inhibitory effect on the medullary, or caudal, reticular formation. The caudal reticular formation itself inhibits the IML, which, to reiterate, is the primary neuron of the sympathetic system. Inhibition of an inhibitory center allows excitation to occur. Thus, the IML would be at a greater central integrative state than would normally be expected in the individual. This now gives us a possible double firing into the IML; when activated, the IML will produce a central vasoconstriction so powerful that there is likely an anoxic condition of the affected tissue.

Anoxic conditions in any tissue produce lactic acid and other nociceptive chemicals, further driving the nociceptive system and increasing the likelihood of IML firing. It can quickly become a catch-22 scenario, whereby nociception produces vasoconstriction, and vasoconstriction produces nociception. As described earlier, peripheral nerve injuries have a great likelihood of leading to RSD. With any peripheral nerve injury, it is large-diameter afferents which are first affected, and it is well-documented how mechanoreceptors and large-diameter afferents in general have an inhibitory effect on nociception at the level of the spinal cord. Thus, through nociception and through the vasomotor effects of the nociception, coupled with the central changes that occur rostrally at the reticular formation and the descending effects, a combination of conditions may lead to this debilitating condition.

As mentioned, treatment protocols under the medical model include the initial modalities of physical therapy and analgesics, which quickly progress to nerve blocks and other radical surgeries. The improvements seen with these treatments have been limited, at best. However, through chiropractic neurological care, we can use the spinal joints, which have the greatest concentration of mechanoreceptors, to fire into the neuraxis and promote inhibition of nociception. (These pathways are well-delineated, and are beyond the scope of discussion of this paper.)

The mechanoreceptor barrage into the spinal cord in fact has a double effect: We are producing very powerful inhibition of nociception at the level of the cord, which will decrease frequency of firing into the IML; and we are also having the suprasegmental effects into the thalamus, which has the descending effects of inhibition due to the firing into the *nucleus raphe magnus* and the subsequent connections into the apical internuncial pools. A point of interest in patient care: Although thalamic controls are ipsilateral, the thalamus primarily receives its input from the contralateral side. Hence, a patient with right-sided pain would most benefit from a left-sided coupled manipulation.

For those not trained in coupled adjustments, any afferentation from the opposite side of major pain will have the best overall effect, long-term, in alleviating the symptoms of RSD. This could include recommending that the patient chew on the opposite side (activating the TMJ mechanoreceptors, which fire into the reticular formation), acupuncture, massage, electrical stimulation, or even exercises. Many patients with very severe symptoms of this disease have responded in a positive manner to such a treatment protocol. Some respond very quickly after receiving no help with any other modalities. Some patients take more time, probably due to the spinal windup, which occurs with increased frequency of firing of these nerve pathways, and the time involved for new plastic changes to occur.

In summary, although the symptoms may be devastating and the medical prognosis poor at best, there are very specific chiropractic neurological protocols that can be followed to afford these

patients some relief. Isolation of the initial nociception must be accomplished first and foremost, to assure that we eliminate any further nociceptive barrage into the nervous system and IML. If it is a chronic patient, many times the initial causative factor has long since healed and may not even be associated with the present condition.

The next step to address is to promote large-diameter afferent barrage into the apical internuncial pool through some stimulus of the system. This could be accomplished by any of the means mentioned previously, with the possibilities of treatment too numerous to address specifically in this article. The final factor to address is treatment of the opposite side of pain, to promote thalamic-hypothalamic-reticulo-spinal pathways and inhibit nociception suprasegmentally. In my experience, when all of these factors are brought into play efficaciously, there are positive and long-standing results that cannot be underestimated in the eyes of a suffering patient.

References

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Edgar Romero, DC, DACNB, FIAMA
Miami, Florida

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