Third Edition

Bonica's Management of Pain

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pathic pain and allodynia is believed to be caused by inhibition of glutamate and aspartate release at NMDA receptor sites, and activation of local GABAergic mechanisms.

Removing the Cause of Neuropathy Is Key to Treatment

Spondylosis is, by far, the most common cause of radiculopathy, and treatment should be aimed at relieving the cause of impingement or entrapment of the nerve root. Local treatment (starting with simple measures such as massage, and, if necessary, escalating to more effective modalities such as dry needling) should be given to all tender and shortened muscles in the affected myotome(s), including paraspinal muscles. The outcome of treatment depends on the modality used and the skill of the therapist.

The fine, flexible acupuncture needle used in intramuscular stimulation is a unique tool for finding and releasing contractures. Contracture is invisible to radiography, computed tomographic scans, or magnetic resonance imaging, and in deep muscles beyond the finger's reach. Deep contracture can only be discovered by probing with a needle. The needle transmits feedback information on the nature and consistency of the tissues it is penetrating. When penetrating normal muscle, it meets with little hindrance; when penetrating a contracture, there is firm resistance, and the needle is grasped by the muscle. This causes the patient to feel a peculiar cramplike or grabbing sensation, which is referred to in acupuncture literature as the *Deqi* or *Teh Ch'i response*. The *Deqi* response is an important finding: It is a sign of muscle contracture and confirms the status of neuropathy.

Myofascial muscle pain is not merely dull and aching. It has a peculiar cramplike quality that is associated with muscle tenderness and shortening. Any experienced dry-needling therapist or acupuncturist would be aware of this distinctive sensation produced by needling a contracture. The classic acupuncturist painstakingly differentiates between pain that has the *Deqi* response (therefore, the muscle is shortened and neuropathic), and pain that does not (nociceptive). This distinction is important because of the difference in the nature and treatment of the two pains. According to Fields, the strange quality of neuropathic pain probably results from disruption of the sensory apparatus so that a normal pattern of neural activity is no longer transmitted to the perceptual centers. He allows that neuropathic pain probably activates nociceptive neurons, because the message that gets through to the perceptual centers is clearly unpleasant, but he astutely notes that patients distinguish the peculiar sensations from *normal* pain sensations (29).

Chronic myofascial pain is not ordinary nociception. *Deqi* pain sensations are not normal because they are associated with receptors that sense muscle shortening (proprioceptors). The classic acupuncturist demonstrates this by the needle grasp occurring at the site of penetration when a neuropathic muscle is needled. Needling is usually pain free when an acupuncture needle enters a normal muscle, but when the needle pierces a shortened muscle, it produces a cramp, and the needle is observed to be firmly grasped by the shortened muscle. The intensity of the needle grasp parallels the degree of muscle shortening, and it gradually eases off during treatment as muscle shortening is released: Release frequently occurs in minutes. Because muscle pain eases concurrently with the release of the needle grasp, patients soon become aware of the importance of eliciting the *Deqi* sensation and releasing needle grasp during treatment.

Progressive Tactile Hypersensitivity

Laboratory investigators presently pursue A-δ and C fiber nociceptive pathways but give little consideration to large-diameter fibers. However, Ma and Woolf have described a noteworthy phenomenon, *progressive tactile hypersensitivity* (30). They have found that repeated light touch to an inflamed paw produced cumulative allodynia. Progressive tactile hypersensitivity can only be induced in inflamed tissue and persists for several hours. It is different from central sensitization induced by C fiber stimulation, which can be induced in noninflamed tissue and lasts only for minutes. Progressive tactile hypersensitivity demonstrates that A-β afferents have the capacity to produce wind-up of spinal cord neurons, normally a C fiber–mediated effect.

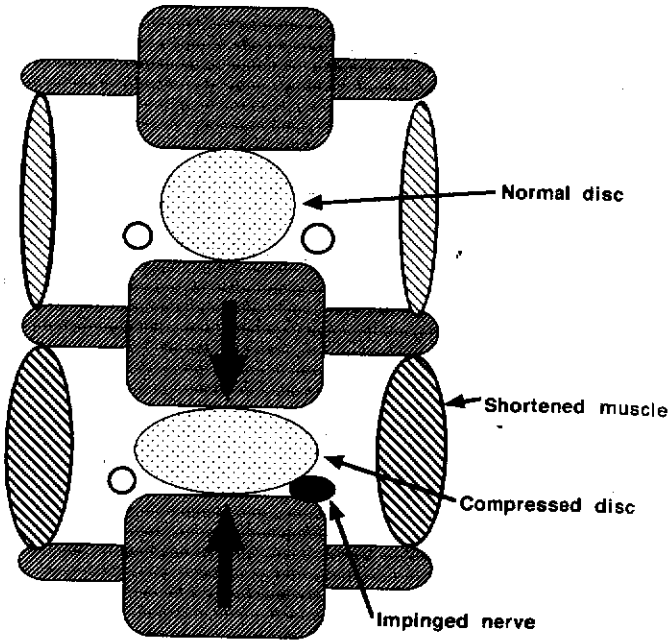

Figure 28-7. Shortened paraspinal muscles across an intervertebral disk space can compress the disk. (From Gunn CC. *The Gunn approach to the treatment of chronic pain*. New York: Churchill Livingstone, 1996, with permission.)

Myofascial pain is not solely A-δ and C fiber nociceptive pain. Muscle shortening is an essential component; by simply releasing a shortened muscle, pain is banished. If large-diameter A-β primary afferents from the cutaneous nerve can contribute to hyperalgesia, is it possible for large-diameter proprioceptor fibers from the muscle nerve to likewise contribute to myofascial pain? Fibers from muscle fascia and other deep tissues must now be studied, in particular group I and II fibers, which sense muscle length and tension, and group III and IV fibers, which sense muscle pain.

In chronic pain, fibrosis eventually becomes a major feature of the contracture; response to dry-needle treatment is then much less dramatic. The extent of fibrosis does not correlate with chronologic age. Scarring can occur after injury or surgery, and many older individuals have sustained less wear and tear than younger ones who have subjected their musculature to repeated physical stress. The treatment of extensive fibrotic contractures necessitates more frequent and extensive needling. To relieve pain in such a muscle, it is necessary to needle all tender bands. It is uncommon to encounter a muscle that is totally fibrotic and cannot be released by vigorous needling.

For long-lasting pain relief and restoration of function, it is essential to release shortened paraspinal muscles that may be compressing a disk and disperse fibrotic tissue that may be entrapping a nerve root (Fig. 28-7). Surgical release is rarely necessary as the needle can reach deeply located shortened muscles.