

Management of Acute Cervical Trauma Due to Hyperflexion/Hyperextension Injury

R. Vincent Davis, DC, PT, DNBPM

Acute cervical trauma involving hyperflexion/hyperextension motion primarily involves damage to perispinal soft tissue in the cervical region. Commonly, the soft tissue involved includes the many ligamentous tissues which are involved biomechanically with the physical integrity of the cervical spinal segments. Although vertebral segments may have been partially displaced, since the ligamentous structures responsible for maintaining these segments in correct anatomical position have been damaged, it is prudent clinical judgement to secure the healing of the soft tissues initially and then give attention to manipulative reduction of spinal lesions unless there are fractures present.

Fractures demand immediate attention by an orthopedic surgeon. In their absence, since acute trauma results in acute inflammatory responses, cryotherapy is recommended initially for at least the first 72 hours, with application following the recommended 20 minutes on/10 minutes off sequence. Reducing the skin temperature by about five degrees C reduces the cutaneous nerve conduction velocity sufficiently to relieve pain and spasm to an appreciable extent.

If additional pain relief is needed, interferential current therapy using the Davis procedure may be effective. If the soft tissue damage is extensive, I prefer concomitant treatment with an orthopedic surgeon on the team. Other than for medicolegal purposes, my experience does not support the use of a cervical collar. Since slight motion of such a lesion is desired in order to encourage repair by areolar tissue, rather than collagen tissue, absolute immobility in the absence of fracture is discouraged.

When examination reveals reasonable absence of traumatic edema with reduction in muscle spasm and some increase in range of motion without induction of pain, pulsed ultrasonic energy becomes an appropriate agent by which to continue the healing process. Commonly, a 5- to 10-day time frame should be allowed for this transition. After achieving a cervical range of motion without pain of several degrees, careful and gentle segmental manipulation may be performed which assumes that sufficient soft tissue stability has been achieved to allow for clinical closed reduction of the lesion without imposing further trauma.

Following this regimen, uneventful progress for several treatments should allow for further transition toward healing.

If clinically justified, intermittent segmental traction may be applied to the cervical spine with no more than 10 pounds of weight used, ensuring a 20 to 30 degree angle anterior to the cervico-occipital line. This angle enhances the patency of the intervertebral foramina. This traction must not deliver a force which will result in countertractional spasm and should not result in perispinal cervical distress. If so, discontinue use.

If therapeutic exercise is used, it should be instituted gradually following the period of ice pack

application and should be restricted to isometric exercises with no joint motion employing cervical spine rotation to the right and left, ensuring careful gentleness to healing soft tissue. Gradually, isokinetic exercises are employed with increasing resistance to enhance range of motion, carefully.

This author has had desirable clinical results with the use of orthopedic pillows in managing such lesions to enhance the return of the normal cervical lordosis and counteract the pathological propensity to degenerative spondylosis which may follow such pathophysiologies. The linear gravity pillow is preferred.

The therapeutic objective of this regimen is to achieve maximum tissue repair with a minimum of residual pathology. The prognosis is dependent, to a large extent, upon the extent to which the soft tissue was damaged. Unfortunately, factors such as age, gender, and pre-existing pathology are additional factors which complicate such a therapeutic regimen and which contribute unfavorably to the prognosis.

References

1. Davis, R.V. Therapeutic Modalities for the Clinical Health Sciences, 1st ed., 1983. Copyright -- Library of Congress TXU-389-661.
2. Griffin, J.E.; Karselis, T.C. Physical Agents for Physical Therapists, 2nd ed. Springfield: Charles C. Thomas 1982.
3. Krusen; Kottke; Ellwood. Handbook of Physical Medicine & Rehabilitation, 2nd ed. Philadelphia: W.B. Saunders Company 1971.
4. Schriber, W.A. A Manual of Electrotherapy, 4th ed. Philadelphia: Lea & Feibiger 1975.
5. Rene Cailliet, F.A. Davis. Soft Tissue Pain & Disability. Philadelphia, Pa., pp 107-145.
6. Anderson, W.A.D. Pathology, 3rd ed. Mosby.
7. Zoethout & Tuttle. Textbook of Physiology, 11th ed., Mosby, St. Louis, Missouri, pp 87-134.

DECEMBER 1990