

Tough Mother

Charles Masarsky, DC, FICC

Each patient education article in "The Evidence-Based Educator" details research documented in *Somatovisceral Aspects of Chiropractic: An Evidence-Based Approach*, co-edited by Dr. Masarsky and Marion Todres-Masarsky, DC.

Much of the anatomy that we deal with every day is mysterious to the average patient. For this reason, an occasional anatomy lesson can be useful. The following patient education article discusses the meninges in a way that makes them relevant to chiropractic patients. Please feel free to use it for tableside talks or lay lectures, or to post on your bulletin board.

From the top of the brain to the end of the spine, a tube of connective tissue envelopes encases the central nervous system. These envelopes are known as the "meninges" (from a Greek word meaning "membranes"). Within the meninges, one finds a series of barriers to infectious organisms and toxins - the "blood-brain barrier." Once blood plasma is purified through this barrier, it bathes the brain and spinal cord with nutrients. This purified substance is called the cerebrospinal fluid.

The outermost layer of the meninges is a tough fibrous structure, the *dura mater* (Latin for "tough mother"). As nerves exit the spine, they are accompanied by extensions of the dura mater - the "dural sleeves." Abnormal tension along the dura mater can have widespread consequences, due to the potential effect on the spinal nerves and the flow of cerebrospinal fluid.

In 1995, a team of anatomists at the University of Maryland found a connective tissue bridge between the dura mater and the small muscles of the upper neck.^{1,2} Among other things, this connection could help explain why so many people with joint problems in the upper portion of the neck (upper cervical subluxation) suffer from headache. In a recent Encyclopedia Britannica publication, the following observations were made regarding chiropractic adjustments for headache patients, in light of this new discovery: "Such treatment, as performed by a chiropractor, would decrease muscle tension and thereby reduce or eliminate pain by reducing the potential forces exerted on the dura via the muscle-dura connection."³

In 1998, a team of anatomists at Anglo-European College of Chiropractic reported another important connection between the dura mater and the neck.⁴ One of the major stabilizing ligaments of the neck, the *ligamentum nuchae*, runs along the back of the cervical vertebrae. The chiropractic team discovered a branch of this ligament that passes between the first two cervical vertebrae and attaches to the dura mater. Rigidity of this ligament is often found in patients with neck trauma or subluxation. In light of their new findings, the investigators reason that this ligament rigidity can create adverse tension in the dura mater, and suggest that this dural tension can lead to neck pain, headache, weakness in the arms, memory loss and disturbances in concentration.

Many people believe that today's clinical sciences can only move forward with electron microscopes, computerized imaging, and large-scale, controlled experiments. In this atmosphere, it

is important to remember that anatomy is the queen of the clinical sciences. In the hands of careful observers, the modest tools of the ordinary dissection kit can still reveal important new findings.

References

1. Hack GD, et al. Anatomic relation between the rectus capitis posterior minor muscle and the dura mater. *Spine* 1995;20:2484.
2. Curl DD. Chiropractic aspects of headache as a somatovisceral problem. In: Masarsky CS, Todres-Masarsky M (eds). *Somatovisceral Aspects of Chiropractic: An Evidence-Based Approach*. Churchill Livingstone, New York, 2001.
3. Hack GD, et al. The anatomist's new tools. In: Bernstein E (ed). 1998 *Medical and Health Annual*, Encyclopedia Britannica, 1997.
4. Mitchell BS, et al. Attachments of the ligamentum nuchae to cervical posterior dura and the lateral part of the occipital bone. *Journal of Manipulative and Physiological Therapeutics* 1998;21:145.

Charles Masarsky, DC
Vienna, Virginia
neurofitness@aol.com

AUGUST 2004