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# The Ligamentum Nuchae

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In a recent article published in *Clinical Anatomy*,[1] Dean and Richard clarified some of the anatomical detail of the upper cervical connective tissue elements.
I think their results are exciting for anyone utilizing craniosacral techniques and/or treating cervicogenic headache.

The *ligamentum nuchae* is that well-developed portion of the supraspinous ligament in the cervical region. It runs from the external occipital protuberance along the tips of the spinous processes of the cervical vertebrae, to the tip of the spinous process of the vertebra prominens (usually C7). The supraspinous ligament can be considered the superficial continuation of the interspinous ligament. This latter ligament runs between the adjacent vertebrae extending from the base to the tip of each spinous process. The ligamentum nuchae is formed primarily from the aponeurotic attachments of the adjacent and subjacent musculature. From superficial to deep, these muscles are the trapezius; *rhomboideus minor*; *splenius capitis*; and the serratus posterior superior.

Dean and Richard found direct fibrous attachments between the ligamentum nuchae and the spinal dura - between the occiput and C1, and between C1 and C2. They found attachments to the *ligamentum flavum* and the spinal dura between C2 and C3. These were not as prominent as the attachments at superior levels. They did not find any direct connections between the spinal dura and the *rectus capitis posterior minor* (RCPM), as had been previously reported.[2] However, they did find a connective tissue band that ran from the deep surface of the RCPM to the posterior atlanto-occipital membrane. This thin membrane runs from the posterior margin of the *foramen magnum* to the upper border of the posterior arch of C1.

It is interesting to note that although most of the cranial dura are innervated by the trigeminal nerve (CNV), the infratentorial portion (the portion inferior to the cerebellar tent) is innervated by upper cervical nerves. It

is tempting to speculate how working the suboccipital soft tissue elements might have a positive impact on relieving cervicogenic headaches. We may be able to effect this end by using several different techniques, including craniosacral, Swedish and counterstrain, among others.

Of further interest for consideration would be to review the anatomy of the transition of the dura from the cranium to the vertebral canal. The cranial dura is comprised of two layers: the outer or endosteal layer, and the inner or meningeal layer. These two layers are contiguous throughout most of the cranial cavities, except where they part to allow for the formation of the dural sinuses. The outer layer also ends at its attachment around the foramen magnum. However, at this latter point, the inner layer continues through the foramen magnum to become the spinal dura. The periosteum of the vertebral canal is the equivalent of the outer layer of cranial dura.

In summary, we see several cervical elements associated with the cranial dura mater by their connection to the spinal dura. The ligamentum nuchae directly attaches to the spinal dura, as does the ligamentum flavum, to a lesser degree. The upper cervical nerves serve the sensory innervation of both the cervical spinal dura and the cranial dura in the posterior cranial fossa. These same nerves supply the sensory elements of the muscles of the deep back and skin over the back. Although the trapezius is innervated by the accessory nerve, its sensory innervation derives from the upper cervical nerves.

A therapist could spend quite some time on the back of a client's neck, and achieve results well-worth the time spent.

*References*


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2. Hack GD, Koritzer RT, Robinson WL, Hallgren RC,Greenman PE. 1995. Anatomic relation between the rectus capitis posterior minor muscle and the dura mater. *Spine* 20:2484-2486.


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