



HOW DEGENERATED DISCS LEAD TO ADHESIVE ARACHNOIDITIS (AA)

It has long been observed that degenerated intervertebral discs (hereafter discs) precede adhesive arachnoiditis. In our reviews of over 1500 MRIs, almost all (over 95%) of persons with AA have degenerated, slipped or herniated discs that press upon the spinal canal cover.

Degeneration Means Crumbling: Discs are greatly composed of soft collagen-laden tissues that are flexible so the spine can bend. The term degeneration means the disc is breaking up and crumbling. If enough breakup occurs, the disc will slide (slip) or herniate out of its socket space and press upon the spinal canal cover which consists of an outer layer, the dura, and an inner layer, the arachnoid.

Two Mechanisms Can Cause: Our studies tell us that degenerated discs that protrude and press upon the spinal canal cover can cause non-adhesive arachnoiditis by two mechanisms. Both mechanisms may be operable at the same time.

Mechanism #1: The degenerated disc literally pushes or bends the spinal canal cover inward. The inner layer of the cover is the arachnoid membrane. The pressure from the protruding disc may cause micro-fissures in the membrane. Spinal fluid that contains many biologic waste products can then enter the cell and cause inflammation.

Mechanism #2: Discs are composed of layers that are soft and filled with collagen. Infectious agents such as Lyme and the Epstein-Barr virus may invade the discs causing inflammation and degeneration. Autoimmunity from a disease such as lupus or psoriasis or viral reactivation may also cause disc inflammation and degeneration. Once the disc degenerates, protrudes, and presses upon the spinal canal cover (both dura and arachnoid layers) inflammation, like cellulitis, can spread into the arachnoid membrane and cause non-adhesive arachnoiditis.

The Steps to Adhesive Arachnoiditis: A protruding, degenerated disc(s) may initiate “acute non-adhesive arachnoiditis.” This stage, if healing doesn’t take place, becomes “chronic non-adhesive arachnoiditis.” Over a period of weeks to years, cauda equina nerve roots will come in direct contact with the inflamed arachnoid membrane. For example, in a reclining position, cauda equina nerve roots may lay on the inflamed tissue. Eventually, cauda equina nerve roots are captured and become inflamed, form adhesions, and fuse (glue) to the arachnoid membrane, hence adhesive arachnoiditis.

Take Home Message: Persons with degenerated discs that press upon the spinal canal cover are at risk to develop non-adhesive and adhesive arachnoiditis. Persons with degenerated discs should be on a preventive program which includes stretching exercises and herbal/natural anti-inflammatories.

References:

1. Takahashi H, et al. Inflammatory cytokines in the herniated disc of the lumbar spine. *Spine* 1996;21:218-224.
2. Zang Y, et al. Intervertebral disc cells produce interleukins found in patients with back pain. *Am J Phys Med* 2016;95:407-415.