HOW LUMBAR PUNCTURES, EPIDURAL INJECTIONS, AND SURGERY CAUSE ADHESIVE ARACHNOIDITIS (AA)

The arachnoid membrane is the inner lining of the spinal canal cover. The dura is the outer layer. The arachnoid does not have a blood supply of its own which makes it more susceptible to prolonged injury. Given here is the pathologic sequence whereby lumbar punctures, epidurals, or surgery may result in AA.

Step One: A lumbar puncture makes a hole in both the dura and arachnoid as may an epidural needle that accidentally punctures the canal cover during the injection of a corticosteroid. Surgery may nick, cut, or traumatize the arachnoid membrane. Epidural injections may inject enough fluid into the epidural space that it may pressure and bend the arachnoid to the point that a small fissure or crack may occur. Epidural injection material can enter the spinal fluid through small channels in the spinal canal cover and act as an irritant on the arachnoid membrane.

Step Two: At the puncture or fissure site on the arachnoid membrane, inflammation may develop around it just like it may around a cut on the skin or around a pimple. The development of inflammation in the membrane is "acute non-adhesive arachnoiditis." Pain will begin. It may radiate as a sciatica-type pain.

Step Three: Unless the acute non-adhesive arachnoiditis resolves, the inflammation will spread and become "chronic non-adhesive arachnoiditis." The inflamed arachnoid membrane will later "capture" cauda equina nerve roots.

Step Four: Cauda equina nerve roots, over time, come into direct contact with the arachnoid membrane especially in the reclining position (sleep). Inflammation may spread to the cauda equina. Adhesive (sticky substance) may develop and fuse (glue) cauda equina nerve roots to the arachnoid membrane producing "adhesive arachnoiditis."

MRI Findings: In our studies of over 1500 persons with AA, we have determined that non-adhesive arachnoiditis can usually be identified on contrast, axial view MRIs.

Summary: Lumbar puncture, epidural injections, and surgery may injure the arachnoid membrane, create inflammation, and form "acute non-adhesive arachnoiditis." This development may become chronic. Later the cauda equina nerve roots are "captured" and produce inflammation and adhesions to form adhesive arachnoiditis.