

Cervical Degenerative Disc Disease Pathophysiology

Pathogenesis of Cervical Degenerative Disc Disease is controversial. Theories include the following alone or in combination:

1. Direct cord compression between osteophytic bars and hypertrophy or infolding of the ligamentum flavum, especially if superimposed on congenital narrowing of cervical subluxations
2. Ischemia due to compression of vascular structures ¹⁾ arterial deprivation ²⁾ and/or venous stasis ³⁾.
3. Repeated local cord trauma by normal movements in the presence of disc protusion and/or osteophytic bars (cord and root injuries ⁴⁾).
 - a. cephalad/caudal movement with flexion extension ⁵⁾.
 - b. anterior/posterior traction on the cord by dentate ligaments ⁶⁾ and nerve roots
 - c. diameter of spinal canal varies during flexion and extension

Increased stenosis is more common in extension.

Unstable segments may sublux (so-called pincer mechanism) ⁷⁾.

Histologically ⁸⁾ there is a degeneration of the central gray matter at the level of compression, degeneration of the posterior columns above the lesion (particularly in the anteromedial portion), and demyelination in the lateral columns (especially the corticospinal tracts) below the lesion. Anterior spinal tracts are relatively spared. There may be atrophic changes in the ventral and dorsal roots and neurophagia of anterior horn cells.

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