

Intervertebral Disc

Disc Injury and Repair

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The adult human intervertebral disc has a very limited capacity to repair after injury. This is due to the absence of a direct blood supply and the limited number of cells within the disc environment. The “injured disc” is often degenerative, a state which predisposed it to become compromised. Subsequently, there are usually numerous factors surrounding the “injured disc”, which adversely influences the recovery process. Even though a patient may be pain free, the functional capacity of the disc is usually reduced.

Disc repair requires that numerous favorable conditions are present. For example, a proper level of growth factor needs to be present to adequately influence cell division and matrix production. The pH within the disc also needs to be in the right range to promote favorable cellular and extracellular activity. The recovery process is often incomplete and involves degenerative changes including dehydration (dessication). Adequate movement of the involved spinal segment influences the physical properties of the replacement tissue, which develops at the site of disruption of annular fibers (disc tear). The granulomatous or replacement (scar) tissue does not have all of the unique chemical and mechanical properties of normal disc tissue.

In the case of a herniated (extruded) disc, the exposed nuclear material will typically lose water volume (dehydrate) over time and subsequently shrink in volume. This can lead to a reduction of related signs and symptoms in some cases. Research suggests that immunological and inflammatory changes contribute to a breakdown of “exposed” disc material within the spinal canal, which also contributes to shrinkage of extruded disc volume.