DISC HERNIATION

The discs are the cushion-like structures located between the spinal bones [vertebrae] in the neck, mid-back and lower back. These discs function to give both support and flexibility to the spine. As a visual picture, the disc looks like a cream filled donut without a hole. However, the center (or filling) of the disc is not creamy but is mucous-like in the very young and dries out as we age to become a more the consistency of crabmeat. This less dense center or nuclear material of the disc is called the nucleus pulposus.

The outer part of the disc is a dense fibrous material with tough rings of tissue that surround the inner cavity containing the less dense material. This outer portion is called the annulus fibrosis. The above description is the appearance of a normal disc.

As we age the discs normally lose water or dry out. This process causes the fibers of the annular fibrosis to lose elasticity and strength. Because of this loss of elasticity the fibers tear more easily with twisting and bending movements of the neck and back. This condition is frequently called disc degeneration, but a more accurate name would be disc desiccation. When the outer portion of the disc or annulus fibrosis develops a tear we say that the disc ruptures or herniates. Because this tear reduces the pressure in the annulus it allows some of the nuclear material to move out of the central cavity of the disc into the torn area of the annulus fibrosis.

If the tear in the annulus extends all the way to the annulus; outer margin, the nuclear material can migrate through this tear to the outer layer and cause the outer layer to swell or bulge out like a weak spot of a balloon. This bulge of the disc can put pressure on the nerve tissue located behind the disc.

This nerve tissue in the neck and upper back is in the form of a solid spinal cord and spinal nerve roots passing behind the vertebrae and discs. At waist level the spinal cord ends as a solid structure and the spinal nerves continue downward in a fluid filled sack called the cauda equina. At each disc level spinal nerves come off of the spinal cord or out of the cauda equina like the roots off of a tree and pass outward into the arms, chest and legs on each side. These nerves are called spinal nerve roots and give feeling and strength to their respective destinations. As an example, the spinal nerve roots in the neck affect the arms, and the spinal nerve roots in the lower back affect the legs.

Injury to the spinal cord can cause catastrophic paralysis below the level of the injury. However, injuries at the level of the cauda equina (or below the waist) rarely cause paralysis. Instead, specific nerve root injuries are more common in these lower levels of the spine. As an example, an injury at the level of the disc between the two lowest vertebrae of the lower back affect either the fourth or the fifth nerve root and typically would result in weakness of the muscles that allow you to pull your foot up toward your knee.

In the third paragraph above, I referred to disc herniation. Disc herniation, disc rupture and slipped disc are three names for the same thing. (There is a misconception that the disc actually slips out from between the vertebrae. However, this is not true). For the ease of discussion, I will use the term disc herniation only. There are varying degrees of disc herniation. A contained disc herniation means that the outer covering of the disc is still intact, keeping the nuclear material from entering the spinal canal where the nerves are. An uncontained disc herniation means that some of the nuclear material is outside the confines of the disc. Disc bulges are contained disc herniation and not as serious a condition as an uncontained disc herniation. A disc extrusion describes an uncontained disc herniation with some of the nuclear material extruding thru the tear in the outer annulus fibrosis and the remainder of the nuclear material still contained inside the annulus fibrosis. A disc sequestration is a form of uncontained disc herniation in which a fragment of nuclear material that has completely escaped from the disc and is free in the space outside the disc where the nerves are located.

Why do discs rupture or herniate? It has generally been accepted that an injury has to occur for a disc to tear or rupture. Now studies are being done suggesting that disc tears and herniations are biologic happenings. In other words, the tears and herniations occur without injury. This would be akin to appendicitis. We are born with an appendix and some of us develop appendicitis spontaneously, with no known cause. Many disc herniations appear similarly with no known cause.