A Synopsis of Nomenclature and Classification of Lumbar Disc Herniation

A Look at the Meaning of the Terms Disc Bulge and Herniation

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Over the years, there has been much confusion among various health care professionals as to the exact meaning of the terms *disc bulge* and *herniation*. Disc herniation, bulge, protrusion, extrusion, rupture, prolapse and a host of other terms have been used with a wide variety of meaning attached to them. It is important for health care practitioners from all specialties to use universal terminology; ultimately, this is in the best interest of the patient, as it allows for appropriate clinical decisions and/or treatment to be instituted.

Universal terminology is of particular importance when radiologists are communicating imaging findings. Both the radiologist and the health care practitioner need to have the same understanding of the terminology so accurate communication and understanding can take place. Universal terminology also is important in the arena of research. Without this universal terminology, trying to compare the research literature can be very confusing, difficult and unrewarding.

In March 2001, a joint task force led by the North American Spine Society (consisting of the American Society of Spine Radiology and the American Society of Neuroradiology) published a paper in *Spine* titled "Nomenclature and Classification of Lumbar Disc Pathology." This paper was instrumental in developing terminology and definitions that all health care practitioners can use. It has since been endorsed by various other organizations, such as the American Academy of Orthopaedic Surgeons, American College of Radiology and the European Society of Neuroradiology, to name a few. The paper\(^1\) was written with just the lumbar spine disc in mind, but the terminology and definitions commonly are used when referring to the thoracic and cervical spine. The purpose of this article is to briefly review the findings of this paper in relation to the terminology of disc bulges and herniations, so accurate understanding of these terms can take place.
When developing this nomenclature, the task force followed a few guiding principles: First, the definitions would be based on anatomy and pathology. Second, the definitions would not imply external etiologies such as trauma. Third, the definitions would not imply a relationship to symptoms. Finally, the definitions would not be associated with or indicate any specific treatment was needed. These principals were needed to gain as much of a consensus as possible.

**Disc Bulges**

This term has been used in the past with a nonspecific meaning. It has been my personal experience that some doctors and students erroneously use this term in place of *herniation*. The task force has defined the term *bulge* to mean "an apparent generalized extension of disc tissues beyond the edges of the apophyses. This extension involves greater than 50% of the circumference of the disc and extends a relatively short distance, usually less than 3mm, beyond the edges of the apophyses." This is in contrast to a disc herniation, which is considered a localized extension, not a generalized extension (as will be discussed shortly). A disc bulge must involve at least 50 percent of the circumference of the disc, but may involve up to 100 percent (Figures 1 and 2).

The terms *symmetric* and *asymmetric* also can be used to describe disc bulges. Asymmetric disc bulges commonly are seen in association with scoliosis (Figure 3). Remember, the task force that developed these definitions was trying to not imply an etiology. A disc bulge, therefore, may be caused by any of a variety of different things, including disc degeneration, response to loading or angular motion, or even a normal variant. Because of this, we need to keep in mind that when we see a disc bulge, we cannot assume it is a result of a pathologic or abnormal process.

**Disc Herniations**

Now let’s look at the term *herniation*. According to the task force, *herniated disc* is the best generalized term to indicate disc material displacement. The task force’s definition of disc herniation is "localized displacement of nucleus, cartilage, fragmented apophyseal bone, or fragmented annular tissue beyond the intervertebral disc space." A localized displacement will involve less than 50 percent of the disc circumference (Figure 4).

This can be further broken down into *focal disc* herniations and *broad-based* herniations. A focal disc herniation involves less than 25 percent of the disc circumference (Figure 5), while a broad-based
herniation involves 25 percent to 50 percent of the circumference of the disc (Figure 4).

Based on the shape of a disc herniation, the terms protrusion and extrusion can be used instead of the term herniation. If it cannot be determined whether the herniation is a protrusion or extrusion, the term herniation is recommended. Even if the determination can be made, some prefer to stay with the term herniation. The definition of a protrusion, according to the task force, is "a herniated disc in which the greatest plane, in any direction, between the edges of the disc material beyond the disc space is less than the distance between the edges of the base, when measured in the same plane" (Figure 6). The definition of a extrusion, according to the task force, is "a herniated disc in which, in at least one plane, any one distance between the edges of the disc material beyond the disc space is greater than the distance between the edges of the base in the same plane; or when no continuity exists between the disc material beyond the disc space and that within the disc space" (Figure 7).

According to this definition, a sequestered disc is actually an extruded disc. A sequestered disc is a displacement of material beyond the confines of the disc that maintains no contact with the disc.

The term free fragment often is used synonymously with sequestration.

Herniations can be classified as being contained or uncontained. According to the task force, this refers to whether the disc materials are entirely restrained by intact outer annulus fibers (contained) or not (uncontained). This is currently not something that can be determined with imaging modalities such as MRI and CT, and therefore is not reportable on imaging studies. The herniation in relation to the posterior longitudinal ligament, however, is sometimes reportable on MRI.

A simple method of assessing the size of the herniation and canal compromise was devised by the task force. The degree of canal narrowing is noted at the herniation’s largest point. A mild herniation implies that less than one-third of the canal is involved. A moderate herniation implies that one-third to two-thirds of the canal is involved. Finally, a severe herniation implies that more than two-thirds of the canal is involved. This same grading scale can be used when talking about the foraminal space as well.

Disc herniations should be described by their location when possible. The location can be described in both the axial and sagittal plane. In the axial plane, the circumference of the disc has been divided into five
zones: central (which can be divided into right and left central), subarticular (region of the lateral recess), foraminal, extraforaminal and the anterior zones. Keep in mind that these zones are by no means equal divisions of the circumference of the disc, but are based on definite anatomic boundaries (not to be discussed in this article). In the sagittal plane, four levels have been identified: disc, infrapedicle, pedicle and suprapedicle levels (Figure 8). These levels are very useful when describing the migration that can take place with a disc herniation.

Another type of disc herniation, often not thought of as a disc herniation, is described as disc material relocated through the vertebral endplates into the vertebral body. This is referred to as an intravertebral herniation, better known as a Schmorl’s node. This often can happen in the setting of major spinal fractures.

For a more comprehensive explanation of these terms and other disc issues, I refer you to the original paper (see reference below).

Reference