Surgical vs. Non-surgical Management of Disc Disease and Spinal Stenosis

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Comprehension of the spinal cord and nerve roots by such pathological alterations as overgrowth in the vertebral body, discs, ligaments, and joints in the vertebral column cause myelopathy, radiculopathy, or both. For decades, every one of these alterations has been known and referred to as osteophyte formations, disc protrusion, disc herniation, hypertrophic ligamentum florum, hypertrophy and calcification of posterior longitudinal ligament, and osteoarthritic joint disease causing facet hypertrophy. Because these conditions result in narrowing of the spinal canal, the intervertebral foramina, or both, in recent years the condition has been referred to as "spinal stenosis."

An intervertebral disc (which is basically a joint) and intervertebral joints undergo similar pathological alterations as do other joints in the body. These alterations are caused by individual propensity for joint disease such as arthritis, trauma, repeated stress and shearing force, and the aging process. As a result of these alterations, up to 85% of the general population will have back pain some time in their life, more frequently in the lumbar than in the cervical area. Approximately 20% of the general population (and approximately 50% of workers) will suffer back pain sufficient enough to require diagnosis and management. However, about 70% of patients with back pain and disc disease require no surgical management and no specific non-surgical prolonged treatment. Hence, the most important function of a physician in management of back pain is not only the diagnosis, but the decision as to what form of therapy would best suit the patient's condition.

Simple myelography is now replaced by CT scan, myelography followed by CT scan, and by MRI scan. CT scan alone, while most useful for bony alterations such as fractures or osteoarthritic joint disease, is not sufficient for accurate evaluation and management of disc diseases and spinal stenosis. For such conditions, the CT scan may have to be repeated after myelography with absorbable contrast. Hence, a simple CT scan alone, as a preliminary evaluation of spinal stenosis may be a waste, causing delay in diagnosis and treatment. The MRI scan is one of the most useful tests for evaluation of myelopathy or radiculopathy caused by disc disease, or when an intrinsic disease of spinal cord or an extra-medullary tumor is of concern. These studies, while more expensive, have practically eliminated the need for prolonged hospitalization or for unnecessary bed rest or physical therapy. Within a short time the clinical condition of the patient can be correlated with the radiologic studies, and the patient's disposition can be determined. Undue avoidance in ordering these tests, or ordering a test not needed for a specific condition would certainly delay diagnosis and treatment, and increase medical cost.

As in other joints in the body, stress and trauma to the vertebral joint will cause various degrees of stretch and shear of the tissues, hemorrhage, and swelling in adjacent ligaments and muscles. These patients usually have local pain in the injured area of the spine without any clinical evidence for myelopathy or radiculopathy. In most cases a plain X-ray of the spine and in some others an MRI of the region would be sufficient to rule out fracture, dislocation, or disc protrusion. In most cases, the condition would spontaneously recover without the need for any surgical intervention. Even when the back pain is severe it diminishes within a few days of bed rest and treatment with analgesics and/or anti-inflammatory medication. Not infrequently, the patient can return to normal activities within two to three weeks. During this recuperation the patient should avoid additional stress to these joints by avoiding heavy lifting and pushing, and sports. Seldom is there any need for physical therapy during this period. Similarly, unless there is evidence for an associated spondylolisthesis, the "degenerative disc disease" and the "bulging discs" seldom require any operative intervention. Yet in recent years, in the U.S. and Europe, there has been a surge of enthusiasm for physical therapy and for manipulation of the spine of these patients. Countless patients report worsening of their condition after "working out" by doing sports; sometimes the
condition becomes worse by enthusiastic manipulation of the spine. Such unnecessary treatment would often delay the patient's return to normal activity, might lead to misunderstanding by the patient about the intensity of the illness, and sometimes it might lead to frivolous legal consideration.

Frequent minor trauma to the discs and to intervertebral joints in workers who do heavy physical activities, and in athletes, gradually cause degenerative disc disease and "bulging discs." This is a condition which ultimately develops later in almost every one approaching the age of sixty, gradually increasing in intensity with aging (Figure 1). These conditions are usually associated with various degrees of recurring back pain with often no need for surgical intervention. Each bout of back pain usually follows some form of stressful physical activity and commonly lasts a few days or weeks. These patients usually benefit from moderate daily exercise and a few weeks of physical therapy with instruction for appropriate movements. The detection of such a condition through excellent resolution of MRI scan and CT myelography in recent years has inadvertently introduced a new avenue for those interested in secondary gain and for unnecessary prolonged treatment. Hence the patient may have unwarranted avoidance to return to normal activities and jobs. Unless a sudden alteration occurs in which the patient experiences persistent radiculopathy or myelopathy, such patients can get along for years without any need for prolonged physical therapy, prolonged medication therapy, and/or surgery.

There comes a time, however, when either a sudden or a repeated stress to the spine is sufficient to produce a herniated disc, causing persistent, unrelenting pain in the extremity which may or may not be associated with various degrees of muscular weakness and/or anesthetia in the related dermatome. Or, progressive spinal stenosis in the elderly occurs to such a degree where there is persistent radiculopathy, myelopathy, or both. In such conditions, an operative procedure to eliminate the specific cause for stenosis is probably the most appropriate treatment and must be considered. The operative management is most helpful in the following conditions:

1. A protruded disc, sufficiently large to produce persistent pain, weakness, or paraesthesia, not relieved by several weeks of conservative therapy (Figure 2).

2. Spinal stenosis in the cervical region, causing progressive increase in the intensity of radiculopathy or myelopathy (Figure 3 and 4). Such patients often have gradual increase in spasticity, difficulty in walking, various degrees of radiculopathy, pain and atrophy of the arms or hands. If not corrected, such patients might progressively become unable to walk and unable to perform their daily tasks.

3. Lumbar stenosis causing progressive cauda equina compression (Figure 5). Such patients often complain of pain in the back and legs. The pain is often worse after a duration of standing or walking; the pain would diminish after a short period of sitting or resting, only to recur after standing or walking. This so-called "neurogenic claudication" may at times be mistaken for vascular insufficiency in the legs.

In our experience, prolonged non-surgical management, such as various pain managements and injections, or prolonged physical therapy is futile among the above three categories. An appropriate operation in well-selected patients should have good results in over 90-95% of the patients with disc disease in whom the disc is sufficiently large to cause persistent radiculopathy; and in 70-80% of the patients in spinal stenosis in whom there is multiple disc disease, hypertrophy of ligamentum flavum, or osteoarthritic joint causing facet hypertrophy.