Lumbar Microdiscetomy and Rehabilitation

Surgical Indications and Considerations

Anatomical Considerations: Unfortunately, because the disc covering has a poor blood supply, healing of the hole where the inner core of the disc extruded may take three to four months to scar over. Therefore, restricting a patient's activity for six weeks after microdiscectomy back surgery will not necessarily prevent a recurrence.

Pathogenesis: A sudden heavy strain or increased pressure to the lower back. Sometimes a sudden twisting movement or even a sneeze will force some of the nucleus out through the disc's outer layer the annulus. Activities that are repetitious may stress the lower back, including poor lifting habits, prolonged exposure to vibration, or sports-related injuries. A herniated disk fragment comes from the nucleus pulposus of the disc. In the normal condition, this nucleus is in the disk center securely contained by the annulus fibrosis. When a fragment of nucleus herniates, it irritates and/or compresses the adjacent nerve root. This can cause the pain syndrome known as sciatica and, in severe cases, dysfunction of the nerve.

Epidemiology: Lumbar microdiscectomy are more common in males that females and has the maximal incidence in the third and fourth decades of life. First-degree relatives of patients with disc herniations have an increased prevalence of disc herniations. Other risk factors include prolonged driving of motor vehicles, frequent lifting of heavy objects, and repetitive twisting.

Diagnosis:

Laboratory and Imaging
CT/Myelography: Excellent when combined with CT for defining disc herniation and bony changes in relationship to the soft tissue abnormality. False negatives usually at the L5-S1 level, where there is a large space between the anterior dural edge and the posterior bony spine. False positives are greater in patients over the age of 55 because of hypertrophic osteoarthritic degenerative changes.
MRI: The current imaging study of choice to demonstrate herniated disc due to noninvasive nature.
EMG: Useful only if diagnosis of neuropathy or primary muscle disease is possible. May have utility in clarifying multi-level disease

Non-operative Verses Operative Management
When Lumbar Microdiscectomy is NOT an Option
The severity of the symptoms (pain, weakness, lack of mobility), the patient's general health and physical condition play an important part in determining when surgery is not an option. In general, surgery is not an option when (1) the back and leg pain is not caused by a ruptured disc; (2) there are mimimal leg symptoms, (3) a medical condition which prevents the surgery, and/or (4) physical therapy could improve reduce the symptoms.

When Lumbar Microdiscectomy IS an Option

Lumbar microdiscectomy is usually recommended when specific conditions are met. In general, surgery is recommended when: (1) a ruptured disc is pinching one or more spinal nerve roots, (2) there is leg pain which limits normal daily activities, (3) there is leg weakness or numbness, and/or there is impaired bowel or bladder functioning.

Surgical Procedure: A microdiscectomy is performed through a small (1 inch to 1 1/2 inch) incision in the midline of the low back. First, the back muscles erector spinae are lifted off the lamina of the spine. Since these back muscles run vertically, they can be moved out of the way rather than cut. The surgeon is then able to enter the spine by removing the ligamentum flavum, and uses either operating glasses or an operating microscope to visualize the nerve root. Often, a small portion of the inside facet joint is removed both to facilitate access to the nerve root and to relieve pressure over the nerve. The nerve root is then gently moved to the side and the disc material is removed from under the nerve root.

Advantages of microdiscectomy or traditional laminectomy: Microdiscetomy results in essentially no destabilizing effect from the removal of the lamina and unilateral ligamentum flavum.

Preoperative Rehabilitation: Usually, a microdiscectomy procedure is performed on an outpatient basis or with one overnight stay in the hospital. Some surgeons restrict a patient from bending, lifting, or twisting for the first six weeks following surgery. However, since the patient's back is mechanically the same, it is also reasonable to return to a normal level of functioning immediately following surgery. Patient is educated on proper wound care and is instructed to keep the wound dry and clean. Change bandages when the dressing gets soiled or wet. Review techniques as to get in and out of bed properly, sleeping positions, sitting, walking and lifting. Patients are usually advised to not lift heavy objects above 10kg for 12 weeks following the surgery.

POSTOPERATIVE REHABILITATION

Note: The following rehabilitation protocol is a summary of guidelines for post-operative articular cartilage procedures provided by Post Surgical Rehabilitation Protocols for the Thoraco-Lumbar Spine: Arthroscopic Microdisectomy Clinical Guidelines. Developed by Measurement Driven Rehabilitation Systems Inc. 1st edition)

Phase I - *Initiation of Spine and Trunk Rehabilitation:* Weeks 1-4

Goals: Control pain symptoms
Minimize loss of range or motion in a pain free zone
Patient education on self-care techniques
Educate patient on postural stability and proper positioning

Intervention:

- Modalities for pain management, such as TENS, ice or heat
- Gentle stretching exercises should be done in the early postoperative period to minimize the any development of postsurgical scarring of the nerve root:
  The stretching should be done about 5 to 6 times a day
  The safest way to stretch is to lie down and maximally flex the hips and gradually extend the knee. This maneuver will also stretch the hamstring muscles, which is important for rehabilitation of the back
  It is generally advisable to do the stretching exercises frequently and gently. Stretching too hard may result in pain, and one should only take the stretch to the to just before the initial point of pain, and not beyond, to avoid inflaming the nerve
- Patient education on proper posture, assisting the patient in finding their neutral spine position
- Isometric exercises of "abdominal draw in," "head flexion in supine," "bridges," and "superman"

Phase II - *Spine and Trunk Rehabilitation*: Weeks 4-8

Goals: Pain control
Minimize loss of trunk strength
Minimize deconditioning by implementing low-impact aerobic conditioning

Intervention:

- Therapeutic exercises:
  At least about 15 minutes of appropriate stretching and strengthening exercises per day
  "Stabilization exercises" form the basis of the exercises, such as the quadruped arm and leg extensions, as well as transverses and lower oblique abdominal exercise progressions
  Aquatic therapy is an option for patients with a great deal of pain
  Walking at a sustained pace for a twenty minutes or more is a mainstay of most back rehabilitation programs
  Stationary biking is also an exercise option for patients who are more comfortable positioned leaning forward

Phase III – *Spine and Trunk Rehabilitation*: Weeks 8-12

Goals: Pain control
Prevention of future episodes of low back pain an associated disability

Intervention:

- Continue use of modalities as needed for pain control
- Progress trunk condition exercises – adding proprioception and motor reprogramming of lower extremity afferents and core stabilization muscles
- Progress intensity and duration of cardiovascular condition exercises such as walking, jogging, running, cycling, skating, cross country skiing, or swimming

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http://www.spine-health.com/topics/surg/overview/lumbar/lumb03.html