

Musculoskeletal Case No. 1, September 1999

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Presenting Symptom: Back Pain, Disc Herniation

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Presenting Symptom: Back Pain, Disc Herniation

Learning Objectives: After completing this educational activity, participants will be able to:

- Diagnose lumbar radiculopathy and the correct nerve level.
- Recognize a herniated disc on MRI.
- Treat and appropriately follow patients with disc herniation.
- Recognize that disc herniation, even a large one does not necessarily require surgery.

History

A 42-year-old married woman, who works as a teacher consultant for special education, presents with a 6-month history of increasing low back and right buttock pain. The pain has been improving, and at this time it is minimal.

- *Prior to continuing, please develop a differential diagnosis and list each possible diagnosis in order of likelihood.*
- *Is there any additional information regarding the clinical history that might be helpful in clarifying your differential list or changing its order of priority?*

Commentary I

At this point the differential is fairly wide open. It includes non-specific low back pain (LBP), pain originating from the S-I joint, intervertebral disc, facet, musculoligamentous structures, and lumbar radiculopathy (resolving). It also includes more serious causes of pain including rheumatologic disorders, tumor, and infection.

There are a number of historical facts that would be helpful. These include:

1. Have these symptoms been present in the past?
2. What was the onset and precipitating course of her problem?
3. When do her symptoms occur, and what precipitates or relieves them?
4. Are there any important associated symptoms such as numbness or tingling, or bowel or bladder complaints? Is there or has there been a fever?
5. Are there complaints of weakness?
6. What investigation or treatment has she had?
7. What medications has she or is she taking?
8. Does she have any other illnesses, or has she in the past?



History, continued

The onset of the problem 6 months ago was gradual over several days. It started in the back and then went to the right buttock and at times it went below the knee to the dorsum of her right foot. It was not associated with numbness or tingling, or weakness. She had no problems with bowel or bladder control. She initially saw her medical doctor who ordered a lumbosacral spine x-ray which was negative, and treated her with an NSAID, but she does not recall the name of it. She was gradually improving, but was referred to a neurosurgeon who ordered an MRI which showed a bulging disc at L4-5 eccentric to the left, and minor degenerative disc disease at L4-5 and L5-S1.

Currently, the pain is much improved and is now at a 2 or 3 out of 10 level. It is increased with bending and is slightly increased with prolonged standing or sitting. Walking does not improve or worsen the pain. It is not exacerbated by coughing or sneezing. It does not awaken her at night.

The patient's past history includes 22 years of intermittent back pain, but never as severe as over the past 6 months, and never involving buttock pain as it does this time. She has continued to work full-time as a special education consultant despite the symptoms. This requires a moderate amount of walking as well as carrying material between classrooms and offices. Prior to the onset of her current symptoms, she had been exercising regularly performing low impact aerobics 3 or 4 times a week. She has not returned to her exercise regimen. Her current medications are ibuprofen 800 mg about twice a week, and hydrocodone 500 mg once every 2 to 3 weeks. She is married and has a 21 year old daughter who is in college. She does not smoke and drinks only occasionally.

- *If necessary, revise your differential diagnosis based on the additional clinical history.*
- *On which details of the physical examination should you focus at this point?*

Commentary II

The differential diagnosis has become more precise at this time. It includes: 1) LBP secondary to damage of a disc, facet joint, ligament, or other local anatomical structure; 2) Resolving radiculopathy. Despite current negative findings on clinical examination, this should be high on the differential because the symptoms extended below the knee and particularly because of the symptoms on the dorsum of the foot. The somewhat intermittent nature of the symptoms fits less well with radiculopathy; 3) Resolving sacroileitis or facet arthropathy; 4) Tumor and infection are unlikely because of the improving picture and negative imaging studies.

Physical Examination

The patient is a normally developed, intelligent woman in no distress. Her height is 5'7" and her weight 145 lbs. She is fully cooperative with the examination. She has a normal gait and is able to toe and heel walk. She is able to squat and return to upright without difficulty. Her spine has a normal configuration with full range of motion, although forward flexion to 80 degrees causes mild low back pain. Her strength is 5/5 in all muscle groups in the upper and lower limbs. Her reflexes are 2/4 and symmetric. Sensation is intact, and straight leg raising produces no complaints of pain.

- *At this point, review your differential diagnosis and revise as appropriate.*



- *Are there additional observations on physical examination that might be helpful in narrowing your differential list?*

Commentary III

The examination is compatible with mild, non-specific back pain. There is nothing to suggest radiculopathy. Further examination should try to better define the etiology of the LBP. The following examinations should be performed: the Patrick maneuver; the Gaenslen and Gillet tests for S-I joint pain; palpation for tenderness over areas of the back, bursae and bony prominences; leg length discrepancy; and muscle range of motion. It is always important to look for non-organic signs (e.g. Waddell's), although you would not necessarily expect them in a patient with no other reinforcers, and who has been working the entire time. No other physical examination findings would be particularly helpful with this mild problem.

Physical Examination, continued

She had no areas of tenderness in the back, or bursa. There was no leg length discrepancy. There was normal hip motion in all directions (Patrick), no pain with forced flexion of one hip and extension of the opposite hip (Gaenslen), and no abnormal pelvic shift or pain with unilateral limb stance (modified Gillet test). There were no Waddell signs present.

- *If necessary, revise your differential diagnosis based on the additional physical findings.*

Clinical Impression

At this point, non-specific back pain is the most likely diagnosis. This could come from any spinal structure including S-I joint, facet, disc, ligament, etc.). She may have had a lumbar radiculopathy, Now resolved. The level is unspecified, but it could have been L5 because of the symptoms over the dorsum of the foot. This patient seems an accurate reporter and had a definite change in the pattern of her back pain. There does not seem to be a clinically relevant disc problem based on the MRI.

- *What diagnostic tests would you order at this time?*

Commentary IV

No further studies are indicated at this time.

- *Considering all the data from the history, physical examination and laboratory studies, what is/are your final diagnostic impression(s)?*

Diagnostic Impression

1. Non-specific low back pain
2. Possible radiculopathy, level undetermined, now resolved

- *What treatment would you now initiate for this patient?*



Commentary V

The treatment at this time should be preventive. Although the natural history of low back pain is to wax and wane, an appropriate exercise program to maintain spine fitness is indicated. This should include lower limb stretching, abdominal strengthening, strengthening of spine stabilizers, and proper back care. Some authors indicate that such a program may help in preventing future episodes of LBP.

Follow-Up

The patient presented 3 months later stating she had followed through with a spine exercise program, had returned to her regular exercise routine, including treadmill and low impact aerobics, and had been doing well until about 3 weeks ago. At that time, she started experiencing pain again, and a numbness that started in the right foot area and progressed to her knee. She had no complaint of weakness, or bowel or bladder dysfunction. She was using Motrin 800 mg intermittently for the pain, and Tylenol #3 once a week.

- *If necessary, revise your differential diagnosis based on the follow-up history.*
- *On which details of the physical examination should you focus at this point?*

Commentary VI

The differential should now include all causes of numbness without major pain. This could include radiculopathy, which may be the result of a compressive lesion or other peripheral nerve disorders such as compressive peroneal neuropathy, and tibial or sciatic mononeuropathy. It might also include central nervous system causes of numbness -- in brain or spinal cord -- from a space-occupying lesion or disease processes such as multiple sclerosis.

Physical examination revealed a patient in no great distress. She had a normal stance and normal configuration to her spine. There was 80° of flexion of her back, and 20° of extension, both resulting in hip and buttock pain. She had normal range-of-motion of her neck, and upper and lower limbs. She had a normal gait, but could not heel walk well on the right. She was able to toe walk, and squat and return to upright. Manual muscle testing revealed 4/5 strength in the ankle dorsiflexors and toe extensors on the right and 4/5 strength in the right foot everters, foot inverters, and hip abductors. No other weakness was detected throughout all four limbs. Muscle stretch reflexes in the upper limbs were 2/4 and symmetric. Quadriceps reflexes were also 2/4 and symmetric. The achilles reflex on the left was 3/4, and on the right was 2/4. The left medial hamstring reflex was 2/4, and the right was absent. There was decreased sensation to pinprick on the dorsum of her right foot and the lateral aspect of her right leg. Other sensation was normal.

- *At this point, review your differential diagnosis and revise as appropriate.*

The differential should be narrowed. It does not seem likely with normal reflexes and gait that we are dealing with an upper motor neuron lesion or a diffuse disease process. The differential should include radiculopathy on the right, primarily L5. The asymmetry of achilles reflexes suggests that there might also be some involvement of S1. Lumbosacral plexopathy and sciatic neuropathy at the sciatic notch should also be considered. Involvement of the more distal peripheral nerves has been excluded.

- *What diagnostic tests would you order at this time?*

Commentary VII

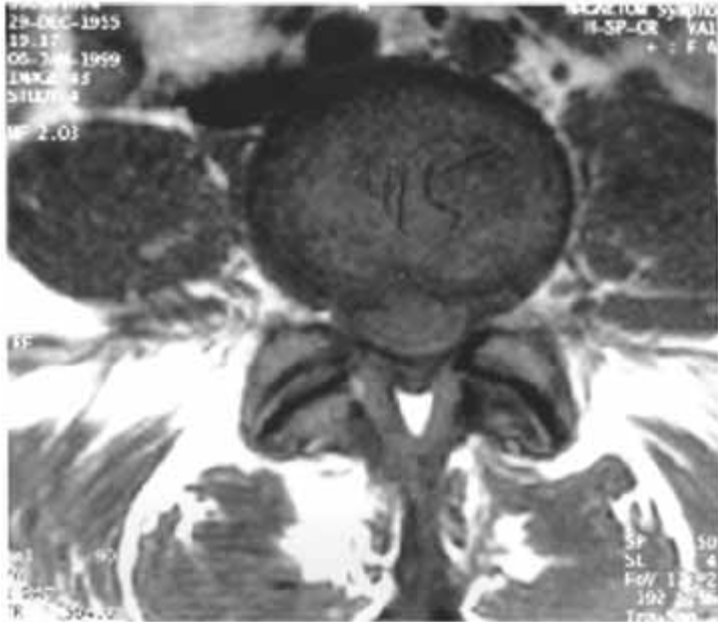
Because of the unusual presentation, it will be useful to determine if this is indeed a spinal, or plexus problem, and determine the etiology. This requires anatomic and physiologic testing. Therefore, an EMG and MRI were ordered.

Electrodiagnostic testing revealed 2+ positive waves and fibrillation potentials in the right anterior tibialis, extensor hallucis longus, peroneus longus, and flexor hallucis longus, 3+ positive waves in the gluteus medius, and 1+ in the gluteus maximus. There were no positive waves or fibrillation potentials in the lumbar paraspinal muscles.

MRI

(For written report, see end of case)





- *What additional diagnostic testing would you order?*

Commentary VIII

No further diagnostic testing is indicated.

- *Considering all the data from the history, physical examination and laboratory studies, what is/are your final diagnostic impression(s)?*

Final Diagnostic Impression

Right L5 radiculopathy secondary to a very large central L4-5 disc herniation.

- *What treatment would you now initiate for this patient?*

Commentary IX

The treatment options for central lumbar disc herniation with radiculopathy are several. The main consideration is integrity of the cauda equina. Pain management can be a major consideration, but in this case, pain is not a prominent symptom. The first decision must be whether surgery is recommended. Although seeing a herniated disc this large can be disconcerting, improvement is not correlated with disc size. The best guide continues to be clinical.

The non-surgical options are:

1. Pain – Control of pain should be tailored to the individual and can vary from no analgesia to opioids such as codeine, hydro- or oxycodone, morphine sulfate, etc.
2. Inflammation – NSAIDS, oral steroids (controversial) or epidural steroids may be used. (Note: Epidural steroid injection can serve to decrease pain very effectively in some cases.)



3. Physical therapy – Many techniques and theories are available, none well proven. These include MacKenzie flexion and extension, spine stabilization, modalities such as traction.
4. Counseling – Education with respect to the problem, and advice regarding activity are a must. In this particular instance, caution seems to be the most prudent approach. She was not having marked pain and was basically experiencing the pain late in the day after working. Placing her at partial rest in the house, and avoiding work, giving her an NSAID and observing her once or twice a week is likely the best approach. She should be advised to call if symptoms progress in any manner, either increasing numbness, weakness, bowel or bladder dysfunction, or marked increase in pain.

Additional Follow-Up

The patient returned on a weekly basis and improved each time she was seen. Her strength recovered after 3 weeks except for 5-/5 foot evertors and 4+/5 toe extensors. She still has minor difficulty with heel walking on the right. After 6 weeks, she returned to work, and on subsequent follow-up she continued to feel well.

Final Discussion

The above case illustrates some important points. When she first presented it was after most of her symptoms were gone, and there were no abnormal findings on physical examination. Therefore, any diagnoses were presumptive. She had a bulging disc, but it was asymmetric to the side opposite the symptoms, and bulging discs are a common finding (>50% in asymptomatic individuals). More pain and less sensory loss would be more characteristic of lumbar radiculopathy. Under usual circumstances, if an individual presents with symptoms and signs compatible with lumbar radiculopathy, imaging is not needed. Imaging is indicated when surgery is contemplated, or if there is reason to suspect an etiology other than herniation of a disc causing the problem.

In this patient's case, the presentation was atypical and her symptoms changed abruptly, so full investigation was warranted. However, if the MRI findings simply indicate a disc herniation, then you should proceed with non-surgical treatment.

The treatment must be tailored to the individual. Since this is a disorder that has a natural history of improvement (even resolution of the disc herniation itself is likely), avoid doing anything that will increase the problem. In this instance, you must consider the following in making treatment decisions, or giving advice.

1. First, do no harm. The disc herniation is very large and improper mobilization can worsen the situation. Since most treatments are unproven, and the pain is only moderate, avoid anything that could precipitate an increase in symptomatology.
2. Her work includes a lot of walking, stairs, carrying files, etc., so it is probably important to keep her off work. Some controversy exists, however, and there are those who would allow her to work with restrictions. If that is done, the patient needs to be carefully monitored and the decision altered, if symptoms increase.



3. That complete bed rest does not seem necessary for lumbar radiculopathy is referenced below. (See article by Vroomen, et al)
4. Another recurrence would be disheartening to the patient, and would tend to move her toward a surgical option that is not usually needed, even with this degree of neurologic deficit and this size disc herniation. The unfounded fear patients often have is that of permanent paralysis and being in a wheelchair for life.
5. In cases of work-related injury or similar situation where reinforcers for pain behavior are present, the Waddell signs become important aids in decisions regarding treatment.

Caution and close attention to how the patient responds to treatment is paramount. Treat the symptoms carefully, and observe closely for progressing deficits. (Note: In patients with low back pain, by far the most common circumstance leading to surgery, is pain that has been unresponsive to non-surgical methods of treatment).

Bibliography

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MRI Report of 1-6-99

Impression

1. Large central disc herniation at L4-5 which markedly impresses the thecal sac.
2. Minimal disc bulge at L5-S1