

Cervical Myelopathy Stemming from Herniated Nucleus Pulposus

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History: On 8/4/95 a 53-year-old male truck driver consulted orthopedic surgeon who ordered MRI of cervical spine and tersely told him he must be admitted to the hospital for surgery the next day. The patient was uncomfortable with this and wanted to pursue conservative treatment before submitting to surgery. Records were requested on the previous examination and MRI results, but were never received by the chiropractic clinic. The patient reported numbness and weakness in hands to chiropractic physician (not the author) on 8/14/95. Orthopedic and neurologic exams performed by doctor's assistant demonstrated positive findings for foraminal compression in the neutral position. Left and right upper extremity reflexes were 2+. The chiropractic physician found no physical upper motor neuron signs at the time nor any disturbances of gait. Sensory dermatomes were recorded as normal, left hand grip strength was 70 lbs. and right hand grip strength 59 lbs. Soto Hall was negative. Kemp sign was positive on the left cervical and dorsolumbar range of motions were recorded within normal limits. The chiropractor diagnosed displacement of cervical disc, cervical neuralgia, moderate cervical hypomobility, and noted on x-ray interpretation the C-5 disc 10was decreased in height with advanced degeneration. The patient was seen 30 times between 8/14/95 and 12/4/95 receiving manipulation and electrical muscle stimulation on most visits with traction used on 2 visits. Very limited subjective history was recorded throughout the treatment plan. On 11/13/95 the patient reported hurting all over right shoulder and an examination was updated. Examination recorded 2+ upper and lower extremity reflexes and the left hand dominant patient's grip strengths were 85 and 92 lbs. in the left hand, 70 and 78 in the right hand. Sensory dermatomes remained normal. The patient was referred out on 12/4/95 for neurosurgical re-evaluation, but continued to drive his truck long distances.

On 1/30/96 the patient finally followed up with a neurosurgeon. The neurosurgeon reported the patient had hyperreflexia and clonus and described a jerking movement in his foot when his ankle was powerfully dorsiflexed. The patient reported a fair amount of

improvement with the chiropractic physician; however, he felt as though he slowly but surely was getting worse with his bilateral, right worse than left arm pains, hand pains, and difficulty using his hands as well as walking. The patient presented with sort of a wide shuffling gait although not grossly abnormal. He knew that his reflexes were quite responsive because he warned the neurosurgeon to stand clear so he would not get kicked. He was clearly hyperreflexic with 4+ reflexes, Babinski produced crossed adductor reflexes (patellar reflex on one leg causes clonus like contraction of hip adductors in opposite leg) in the legs, positive Hoffman's reflexes (middle finger nail is flicked by examiner and causes thumb to appose) bilaterally, clonus and up going toes. He had not relative sensory level nor Lhermitte's sign and had poor bilateral biceps reflexes. MRI scan from August of 1995 was clearly abnormal with a large C5-C6 disc herniation and increased signal from the spinal cord. The neurosurgeon reflected to the patient that this type of lesion should be operated on since he now had evidence of myelopathy and long standing cord compression. The increased signal demonstrated on the MRI is indicative of

Figures 1 & 2. Axial and sagittal T2 weighted MRI images of cervical spine. Moderately large herniated nucleus pulposus right central C5-6 level deforming cervical cord. Abnormal signal focus within cord at level of herniated nucleus pulposus.



some cord damage. Abnormal signal may sometimes be seen within the cervical cord at the level of an extrinsic mass effect, such as a focal herniated nucleus pulposus as in this case. Differential considerations for such signal abnormalities include edema, inflammation, vascular ischemia, myelomalacia, and gliosis. Postoperatively after adequate decompression, these changes may resolve. Having had this about 10 months, he probably will not get a total return of useful function, but certainly he needed to be stabilized.

Surgical History: Admitting diagnoses on 2/22/96: cervical herniated nucleus pulposus C5-C6 with myelopathy. The patient was brought to the operating room and placed under satisfactory general endotracheal anesthesia via an awake fiberoptic intubation with good movement of all four extremities post intubation. He was then placed under general anesthetic. He was prepared for anterior cervical discectomy. The anterior spur most prominent at C5-C6 was also correlated with a clinical localization of C5-C6. The anterior half of the disc and anterior bone spur were removed. A partial corpectomy was performed for better seating of the bone plug. The remaining disc was removed back to the posterior longitudinal ligament. A large fragment was found along with a smaller fragment. The small fragment was easily removed, however the large anterior fragment was adherent to the markedly thickened posterior longitudinal ligament. The ligament was not necessarily calcified but was thickened, indicating that the disc herniation had been there for quite some time as supported by the patient's history. The bone plug was trimmed with an appropriate height, width, and depth and wedged with the tricortical edges posteriorly and laterally by removal of the vertebral body spreaders. A now snug bone plug was in the anterior two-thirds of the disc space for generation of a fusion.

About 6 weeks post surgery, the patient was examined and his myelopathy was decreased with only 6-8 beats of clonus in the right leg and no beats of clonus in the left leg. He was having numbness and burning sensations in his arms. There was some concern at this point about the development of a reflex sympathetic dystrophy. However, he did not have any hypersensitivity, discoloration, or any other signs at that time. The patient was weaning himself out of his hard collar but was to continue use of a soft collar when driving his car. By 5/14/96, the patient only had 2-3 beats of clonus as a clinical finding and returned to work driving a truck. In September of 1996 a phone interview was attempted; however the patient is mostly out of town driving. His wife reports he is able to work, but continues to complain of neck pain and weakness.

Significant factors in this interdisciplinary case: Firstly, the patient was run away by the first surgeon he consulted due to lack of bedside manner. While that surgeon was justified in his recommendation of surgery, he did not communicate effectively with the patient who ultimately interpreted the surgeon's recommendations as rash and lacking in options. Secondly, the chiropractic physician never received critical information (MRI records and reports) which he could have used to further motivate the patient to receive



Figure 3. Intraoperative lateral cervical spine radiograph. Anterior metallic probe marks anterior C5-C6 disc space.

consistent rather than sporadic care by showing the MRI evidence of permanent damage. Additionally, the chiropractic physician's notes were not interpretable by other providers and no narrative report was sent to the referred neurosurgeon. This may have left the impression with the treating neurosurgeon that substandard care had been rendered. A brief explanation of the conservative treatment trial and summary of results and need for further surgical evaluation may have alleviated any concerns. The key to interdisciplinary care is communication which benefits the patient as well as the treating doctors.

Even though the patient's notes lacked physical signs of myelopathy during the time the chiropractic physician treated the patient, there were signs of myelopathy on MRI as demonstrated by signal changes within the cord. This left the chiropractic physician in a position of increased liability should any coincidental misadventures have occurred under his care. The literature strongly supports the use of chiropractic care and spinal manipulation in the treatment of cervical radiculitis and other peripheral nerve disorders in the absence of upper motor neuron signs. Patients with the presence of upper motor neuron signs such as hyperreflexia, clonus, pathological reflexes, or early signs such as found on MRI should be considered ticking cases with limited time available for conservative measures. Usually these cases demand invasive treatment to relieve cord pressure, prevent permanent damage from contusion and stabilization limiting the possibility of trivial insults causing paraplegia or death.

The case was originally presented in an interdisciplinary back care group meeting. The case provides many practical as well as academic points which encouraged the primary author (Gottlieb) to collect further history and records from the treating doctors in order to assemble the case study.

About the Authors: Dr. Gottlieb was the NCCA Doctor of the Year 1996 and practices chiropractic in Raleigh, NC. Dr. Rich practices neurosurgery in Raleigh and started an interdisciplinary back care group which meets informally every few months to share information and present case studies. Dr. Finkel is a medical radiologist who specializes in producing high resolution Magnetic Resonance Images in a hospital environment.