CASE REPORT

Cervical Cord Compressive Myelopathy in a Man With a Primary Complaint of Knee Pain

Michael D. Ross, PT, DHSc¹; Ryan Elliott, PT²

¹US Air Force Physical Training Program, Fort Sam Houston, Texas; ²Kaiser Permanente Medical Center, Vallejo, California

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Abstract

Background: Diagnosing patients with cervical cord compressive myelopathy in a timely manner can be challenging due to varying clinical presentations, the absence of pathognomonic findings, and symptoms that are usually insidious in nature.

Objective: To describe the clinical course of a patient with primary complaint of left medial knee pain that was nonresponsive to surgical and conservative measures; the patient was subsequently diagnosed with cervical cord compressive myelopathy.

Design: Case report.

Subject: A 63-year-old man with a primary complaint of left medial knee pain.

Findings: Physical examination of the left knee was normal except for slight palpable tenderness over the medial joint line. During treatment, he noted loss of balance during activities of daily living. Reassessment revealed bilateral upper extremity hyperreflexia, bilateral Babinski reflex, and positive bilateral Hoffman reflex. Magnetic resonance imaging of the cervical spine demonstrated moderately severe spinal stenosis at the C3-C4, C5-C6, and C6-C7 levels. After C3-C7 laminoplasty for cervical cord compressive myelopathy, he reported substantial improvement of his left medial knee. Three years later, he had no complaint of knee pain.

Conclusion: Appropriate diagnosis and treatment of cervical cord compressive myelopathy may avoid unnecessary diagnostic imaging, medical evaluations, invasive procedures, and potential neurologic complications.

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Key Words: Spondylosis, cervical; Myelopathy, compressive; Tetraparesis; Paraparesis; Pain

BACKGROUND

Cervical cord compressive myelopathy is characterized by spinal cord compression due to physiologic narrowing of the sagittal diameter of the spinal canal secondary to congenital and degenerative changes in the cervical spine (1). Cervical cord compressive myelopathy is the most common cause of spinal cord dysfunction in older individuals (2). In a prospective study that assessed the

relative frequencies of cervical cord compressive myelopathy, 24% of patients with nontraumatic tetraparesis or paraparesis admitted to a regional neuroscience center had cervical cord compressive myelopathy (3).

Diagnosing patients with cervical cord compressive myelopathy in a timely manner can be challenging due to varying clinical presentations, the absence of pathognomonic findings, and symptoms that are usually insidious in nature characterized by disability levels that may not significantly change for long periods (4). Additionally, diagnosis can be further complicated because several other conditions can present in a similar manner as cervical cord compressive myelopathy (2). These diagnostic challenges can lead to a failure in accurately and efficiently identifying patients with cervical cord compressive myelopathy, which can result in progression of symptoms that may no longer be effectively treated with either conservative or surgical measures (5). The purpose of this report is to describe the clinical course of a patient who had a primary complaint

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Please address correspondence to Michael D. Ross, PT, DHSc, Physical Medicine, US Air Force, 598 American Flag, Cibolo, TX 78108; p: 707 628 5950; f: 940 676 3335 (e-mail: romoross@msn.com).

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of left medial knee pain after a twisting injury 3 years prior that was nonresponsive to surgical and conservative measures; the patient was subsequently diagnosed with cervical cord compressive myelopathy. After surgical management, the patient's left medial knee pain ceased.

CASE DESCRIPTION

A 63-year-old man presented with a primary complaint of left medial knee pain, which was limiting his ability to perform activities of daily living. The knee symptoms, which he described as intermittent, diffuse pain with feelings of cramping and swelling, had been present for more than 3 years. He associated the pain with a twisting injury of his left knee while exiting his vehicle.

Radiographs at the time of the knee injury demonstrated slight osteoarthritic changes in the medial tibiofemoral joint space. Magnetic resonance imaging (MRI) revealed a torn medial meniscus. Previous interventions included an arthroscopic plicectomy and meniscal debridement 2.5 years earlier and an intra-articular corticosteroid injection 2 years earlier. These interventions did not improve the patient's left knee pain.

Symptoms were aggravated by prolonged sitting and standing and minimally eased with gentle movement. The patient also reported left calf atrophy and intermittent numbness and tingling in the posterior calf region, which had been present for the past year, as well as intermittent low back pain to varying degrees over the past 13 years.

The patient had undergone recent neurologic and orthopedic consultations, and conservative management was recommended. He denied weight change, fever/chills/sweats, bowel/bladder changes, or difficulty maintaining balance with walking. Past medical history was unremarkable, and his general health was excellent. He was not taking any medications.

The patient demonstrated normal gait, but left calf atrophy was noted. Active range of motion testing of the lumbar spine in standing was within functional limits with low back pain elicited at the end of forward flexion active range of motion. Neurologic examination revealed a diminished left Achilles tendon reflex, the ability to complete 3 left-sided heel raises in left single leg stance (he was able to complete 10 right-sided heel raises in right single leg stance), and normal pinprick sensation bilaterally in the lower extremity dermatomal regions. Straight leg raise testing was limited bilaterally to 65 degrees of hip flexion due to perceived hamstring tightness. Palpable tenderness and hypomobility were noted with posterior to anterior pressures over the spinous processes of L4 and L5. Examination of the left knee demonstrated no deficits in range of motion, and strength of the hamstrings and quadriceps musculature was normal. Left knee ligamentous and meniscal testing were unremarkable. Knee effusion was not present. Mild palpable tenderness was noted over the medial joint line of the left knee.

The patient was treated by a physical therapist over the course of 4 weeks with manual therapy to the lumbar spine, hips, and knees and a therapeutic exercise program, which targeted the trunk and lower extremity musculature. There was no change in his left knee symptoms, but neurologic examination revealed a diminished left Achilles tendon reflex, the ability to complete 1 left-sided heel raise in left single leg stance, and a slight decrease in pinprick sensation in the left S1 dermatomal region.

Lumbar spine MRI revealed degenerative loss of L5-S1 disc height with a grade 1 retrolisthesis of L5 relative to S1 with posterior disc bulging. Additionally, left L5-S1 degenerative facet arthrosis and ligamentum flava hypertrophy caused encroachment upon the left S1 superior lateral recess and nerve root. Subsequent electromyographic and nerve conduction velocity testing yielded results consistent with left S1 radiculopathy. The patient was then referred to a physician specializing in interventional treatment of the spine. However, it was not clear whether the patient's left medial knee pain was related to the S1 radiculopathy.

While awaiting the appointment with the spine specialist, the patient reported 2 episodes of insidious loss of balance during routine yard work. Subsequent reassessment revealed bilateral upper extremity hyperreflexia, bilateral Babinski reflex, positive bilateral Hoffman reflex, and a multidermatomal decrease in upper extremity sensation during pinprick testing.

Neurologic examination revealed a wide-based gait, 2 episodes of balance loss during gait assessment, and a positive Romberg test. Magnetic resonance imaging of the cervical spine demonstrated moderately severe spinal stenosis at the C3-C4, C5-C6, and C6-C7 levels (Figures 1 and 2). There was no apparent laterality to the cord compression that might account for the unilateral left lower extremity symptoms. The patient was diagnosed with cervical cord compressive myelopathy, referred for neurosurgical consultation, and underwent C3-C7 laminoplasty.

Immediately after cervical spine surgery, the patient reported substantial improvement in his left medial knee symptoms, and his gait was also markedly improved. The signs and symptoms associated with the left S1 radiculopathy did not improve. Therefore, conservative treatment for his left S1 radiculopathy was continued, which resulted in increased ankle plantar flexor strength that did not interfere with his functional activities. At 3 years after surgery, the patient had no complaints of left medial knee symptoms and was able to perform all activities of daily living without limitation.

DISCUSSION

Failure to accurately identify patients with cervical cord compressive myelopathy in a timely manner can result in progressive symptoms that may not be effectively treated with conservative or surgical interventions (5). Moreover,

Figure 1. Sagittal T2-weighted magnetic resonance imaging of the cervical spine, which demonstrated moderately severe spinal stenosis at the C3–C4, C5–C6, and C6–C7 levels, with less severe spinal stenosis at the C4–C5 level. There is partial fusion of the C2 and C3 vertebral bodies. There was also increased signal in the posterior vertebral body of T3 and some smaller foci of increased signal in the C5 vertebral body, which were thought to represent small hemangiomas.

early detection of cervical cord compressive myelopathy of a progressive nature is critical, because surgical treatment has been shown to retard the effects of cervical cord compressive myelopathy when it is managed in a timely fashion (4).

In this case, the chief complaint was left medial knee pain, which was thought to be primarily related to knee osteoarthritis with possible somatic referral from the lumbar spine (6,7). The patient was eventually diagnosed with left S1 radiculopathy based upon physical examination findings (ie, diminished left Achilles tendon reflex and decreased left ankle plantarflexor strength), as well as the results of electromyographic and nerve conduction velocity testing. However, it was not clear whether the left knee pain was related to the S1 radiculopathy. The

diagnosis of cervical cord compressive myelopathy was not considered until the patient began to report subtle gait disturbances during activities of daily living. Previous authors have reported that subtle gait disturbances are the most common symptoms associated with cervical cord compressive myelopathy (8).

Subsequent physical examination findings revealed a positive Romberg test, bilateral upper extremity hyperreflexia, bilateral Babinski reflex, positive bilateral Hoffman reflex, and a multidermatomal decrease in upper extremity sensation during pinprick testing. Therefore, although the presentation was somewhat unique, the patient's myelopathic signs and symptoms were not, and it was these signs and symptoms that led to cervical MRI. Once the diagnosis of cervical cord compressive myelopathy was made, the patient underwent C3–C7 laminoplasty, and his left medial knee pain and gait markedly improved.

An interesting aspect was that the patient's left medial knee pain ceased but the signs and symptoms associated with the left S1 radiculopathy did not immediately improve after surgical intervention. This suggests that the medial knee pain may not have been associated with the left S1 radiculopathy. The patient underwent extensive evaluation and treatment over the course of 3 years with little relief of his medial knee symptoms, including MRI, an arthroscopic plicectomy and meniscal debridement, an intra-articular corticosteroid injection, and physical therapy.

Before being diagnosed with cervical cord compressive myelopathy, the patient was also referred to a physician specializing in the interventional treatment of the spine. In our opinion, the signs and symptoms associated with the S1 radiculopathy complicated this case and perhaps led to a delay in the diagnosis of cervical cord compressive myelopathy. It has been reported that diagnosing cervical cord compressive myelopathy is especially difficult in patients with lower extremity pain alone without neurologic symptoms or in those patients whose lower extremity symptoms are thought to be related to the lumbar spine (9,10). In patients with recalcitrant lower extremity pain that is not clearly related to the lumbar spine or musculoskeletal structures of the lower extremity, cervical cord compressive myelopathy should be considered in the differential diagnosis.

Review of the literature revealed only a few reports of lower extremity pain caused by cervical cord compressive myelopathy (9–12). Although the precise mechanism is not clearly understood, irritation of the spinothalamic tract has been proposed as a cause (9,10). To facilitate the diagnosis of cervical cord compressive myelopathy as a cause for lower extremity symptoms, some authors have attempted to describe the associated clinical symptoms. It has been reported that the pain is usually described as burning, boring, or aching (12). The pain is usually bilateral and diffuse (9,11); if the pain is unilateral, it is usually contralateral to the side of cord

Figure 2. Left: T2-weighted magnetic resonance axial image at C2–C3 demonstrated normal visualization of the spinal cord and cerebrospinal fluid in the subarachnoid space (arrow). Right: T2-weighted magnetic resonance axial image at C3–C4 demonstrated central canal stenosis and obliteration of the subarachnoid space (arrow).

compression (10,11). Additionally, in older patients, the pain presentation may not be consistent with other likely musculoskeletal disorders, such as osteoarthritis (12). Although these findings may be helpful, a conclusive diagnostic test is unavailable and pain relief after surgery is the only confirmation that the pain was related to cervical cord compressive myelopathy (12).

This case study should be interpreted with caution because we cannot infer a cause-and-effect relationship between the cervical cord compressive myelopathy and left medial knee pain. Furthermore, it is possible that the outcome described for this patient was coincidental or related to placebo effect. Because there are only a few reports of lower extremity pain being associated with cervical cord compressive myelopathy (9–12), a series of patients might serve as better evidence to support a causal relationship between cervical cord compressive myelopathy and lower extremity pain.

CONCLUSION

Appropriate diagnosis and treatment of cervical cord compressive myelopathy may avoid unnecessary diagnostic imaging, medical evaluations, invasive procedures, and potential neurologic complications. Although the presentation described in this case is somewhat unique, the eventual myelopathic signs and symptoms were not. It was these myelopathic signs and symptoms that led to cervical MRI, the diagnosis of cervical cord compressive myelopathy, and surgical management.

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