Case Report

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Clinical red flags in the diagnosis of a patient with atypical lower limb pain-a case report

Abstract

Background and purpose: When a patient's signs and symptoms do not promptly point to a plausible cause of pain or dysfunction, it is important to think about a differential diagnosis. This case report describes the clinical decision-making and differential diagnostic process for a patient with atypical bilateral lower limb pain due to a benign thoracic spinal tumor.

Case description: The patient had a sixteen-month insidious onset and progressive aggravation of a bilateral, non-specific foot pain and tingling, followed by left knee pain and weakness, right hip and low back pain, as well as poor balance and gait abnormalities.

Outcomes: Following surgical resection of a thoracic schwannoma and three months of rehabilitation, patient recovered completely.

Discussion: This case demonstrates the need for physical therapists to judiciously listen to patients' complaints, even when these do not make sense objectively, and perform a complete neurological examination whenever bilateral limb symptoms are reported, even as common as foot pain.

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Introduction

As the development toward direct access to physical therapy services grows, it is important for physical therapists to recognize patients' symptoms appropriately, especially when these are atypical, and make immediate referrals for further testing when necessary.[1] The main objective of a physical therapy evaluation is to determine whether intervention is appropriate, whether consultation with another healthcare provider is needed, or whether the patient needs to be seen by another practitioner.[2] The patient's description of symptoms and the therapist's assessment of objective signs should make sense, be based on the therapist's knowledge of basic and clinical sciences, and on the clinical experience of the therapist. If the symptoms and clinical signs are atypical, the therapist should suspect an etiology which could potentially be serious, such as infection, visceral disease, or malignancy.

As an example, spinal tumors will occasionally cause compressive atypical neurological symptoms.[3] mimicking those of multiple sclerosis or common musculoskeletal symptoms such as plantar foot pain, quadricipital insufficiency, or sciatica -- problems frequently referred to physical therapists for treatment.

Tumors like schwannomas and neurofibromas, which account for approximately 30 percent of primary intra spinal neoplasms,[4-5] can produce such atypical neurological symptoms. It is important for physical therapists to be able to make a distinction between "classic" musculoskeletal symptoms, and atypical ones for which the clinical presentation is usually the delayed onset of progressive symptoms. This case report describes a patient with progressive lower limb pain and sensory impairments, which eventually revealed themselves as neurologic sequelae caused by a focally asymptomatic, benign, and rare tumor of the spine: a thoracic intradural and extra medullary Schwannoma.

Schwannomas are benign tumors originating from Schwann cells. Schwann cells are a variety of neuroglia that primarily provide myelin insulation to axons in the peripheral nervous system of vertebrates.[6] They are the peripheral nervous system's analogues of the central nervous system oligodendrocytes.

Spinal intradural extra medullary tumors account for two thirds of all intra spinal neoplasms and are mainly represented by meningiomas and schwannomas, with the latter accounting for 60 to 75 percent of all primary intra spinal tumors.[7] Most often benign tumors such as schwannomas do not cause neurological sequelae. Intradural spinal tumors account for only a small proportion of central nervous system tumors, with an incidence of 0.3 per 100,000 per year. Presenting symptoms are varied.[8] They are typically slowly progressive, with or without back pain, and may mimic the results of neurological disorders such as multiple sclerosis, lumbar radiculopathy, peripheral neuropathies, or upper motor neuron lesions. The incidence of common symptoms and signs are shown in (Table 1).

Table 1 Clinical symptoms and signs, on initial examination, of extra medullary and intra medullary spinal tumors[10]

	Extra Medullary Tumors (n=76) (Prcentage of Cases)	Intra Medullary Tumors (n=39) (Percentage of Cases)
Pain (Local or Radicular)	-63%	-49%
Sensory Disturbance	-39%	-54%
Limb Stiffness	-20%	-36%
Limb Weakness	-53%	-41%
Sphincter Disturbance	-20%	-10%
Weakness	-55%	-69%
Spasticity	-29%	-23%
Sensory Disturbance	-36%	-36%

The purpose of this case report is to describe the process of making a differential diagnosis for a patient with atypical lower limb pain and weakness.

Case description

Patient description

The patient was a healthy and fit 46 year-old woman (165 cm, 67 kg) who was employed as a full-time sign coordinator for a large retail store. Her medical history was unremarkable, except for a right ankle sprain about a year before she was referred to our clinic. Her case was chosen because over 16 months she presented with an array of

symptoms in her lower limbs and her back that were misleading to her caretakers. It was not until her symptoms changed dramatically that their etiology was revealed. Her condition did not prevent her from working or function at home, but it affected her quality of life and altered her sleep. She had no children and was generally healthy. She was referred for physical therapy to address bilateral foot pain. Her goals were to be pain free and return to her previous level of function, which included walking for at least one hour to go shopping.

This patient signed and provided an informed consent to treatment when physical therapy was initiated, and signed an informed consent at the completion of her care, allowing the production of a report about her case. Health Insurance and Portability and Accountability Act (HIPAA) requirements for disclosure of protected health information were covered Table 2a & 2b.

Table 2a Case Description

Medical Diagnosis	Time Frame	Key Findings	P.T. Diagnosis
Initial Referral 1. Refractory Bilateral Plantar Fasciitis (Physician)	03/13/02	- Slight medial whip when walking. Mild pes planus - Bilat. Plantar Flexion weakness(2/5) - Achilles' DTR: WNL - Pain 2nd 3rd Met heads - Nocturnal foot pain (4/10) - Mild N/T both feet	- Bilateral Metatarsalgia - Unclear etiology of Plantar flexion weakness
Two Months after Initial Referral 2. Right Patello-Femoral Syndrome (Orthopedic Surgeon)	05/13/02	- "Burning & tightness" of R knee with 8/10 pain. Insidious onset - No limp - Mild effusion R knee (~1cm) - Quad strength: 4+/5 - ROM: WNL - RLE ¾" longer - Past History: Strained quad 1981 - Persistent foot pain 4/10	- Mild synovitis - Chronic metatarsalgia
Five Months after Initial Referral 3. Right Piriformis Syndrome (Orthopaedic Surgeon)	08/16/02	- Insidious onset of low back ache over past 6 months (5-6/10) - Tenderness L5-S1 (R) - Bilat SLR = 90° - Slight Bilateral genu recurvatum - Depressed DTR's R Achilles' and medial hamstrings	- S1 nerve root compromission
Seven Months after		- "Burning pain" along post. aspect	"Red Flag"
Initial Referral 4. Right Sciatica (New Primary Md)	10/21/02	RLE 7+/10. Aggravated by sneezing, sitting; - Fall 10/07/02 when L knee "buckled under"; - Gait abnormality with marked Hyperextension of L knee; - Feet are "cold" all the time; - No detectable tenderness in spinal segments - Spinal ROM= WNL & pain free; - R Achilles' DTR = 0; - Hyperreflexic quads (3+ bilat)	For insidious possible demyelinating neuropathy
Nine Months after Initial Referral 5. Left Ankle and Left Quad Insufficiency (Orthop)	12/30/02	- Same findings as above - Pt awakens 2-3 x night with back & LE pain	Same as above

Examination

Phase I. Diagnosis: Refractory Plantar Fasciitis

A. History: At the initial interview the patient reported that she had had bilateral foot pain for 6 months with an exacerbation about two months prior to her examination. Initially, she saw her primary care physician who gave her exercises and a prescription for an anti-inflammatory medication. Her foot pain continued to get worse and the physician referred her for physical therapy with a diagnosis of "refractory plantar fasciitis". Another physical therapist initially saw this patient, approximately 6 months after the onset of her foot pain.

B. Examination: Pain. This patient's chief complaint was bilateral foot pain, worse in the morning, rated as 5-6/10 on a visual analog scale (VAS). She woke up 4-5 times a week as a result of foot pain, and her walking tolerance was 45 to 60 minutes. She reported that her feet "felt swollen", and that her left knee felt "inflamed" when she walked. Her medications at the time included Vioxx (Merck & Co., Inc.) once-a-day, which she was taking as directed, and a hormonal supplement.

C. Posture/observation: The patient's standing posture observed from the anterior, lateral and posterior aspects was unremarkable; including foot and ankle landmarks. The inter rater reliability of

visual observation of posture has been supported by Van Dillen et al.[9] (Kappa values ≥.40 for 72% of items related to alignment and movement).

D. Gait: Observational gait completed from the posterior, anterior and lateral sides, revealed that the patient walked without limping, with a mild bilateral medial whip of her feet. Visual gait observation is often used to determine gait disorders and to evaluate treatment. A recent study on observational gait analysis showed it had moderate reliability.[10] (Inter-rater reliability (ICC = 0.54; 95%CI: 0.48–0.60); intra-rater reliability = 0.63 (ICCs 0.57 to 0.70). Gait analysis for normal and pathological function has been extensively described by Perry.[11]

E. Range of Motion (ROM): Active and passive ROM of feet and knees were estimated to be within normal limits and pain-free. Comparing sides, ROM measurements of limbs can be quickly assessed in the clinic visually, or with a universal long-arm goniometer. A recent study of intra tester reliability for goniometric measurements of the knee found it to be high.[12] (intra class correlation coefficients [ICCs] = .997 in flexion, = .972 to .985 in extension).

F. Strength: Manual muscle testing (MMT), as described by Kendall et al.[13] was used to assess the patient's ankle/foot and knee strength. Foot plantar flexion strength was rated as 2/5 bilaterally, inversion and eversion as 4 and 3/5 respectively and bilaterally, and all other movements were rated as 5/5. Muscle testing can be done manually or with a hand-held dynamometer. Intra rater reliability is high.[14]

G. Deep tendon reflexes: Achilles deep tendon reflexes (DTR) were rated as normal and symmetrical. A study by Manshot.[15] showed that the inter observer agreement among physicians on testing tendon reflexes, assessed with kappa statistics, was never better than "fair" (highest kappa value 0.35).

H. Palpation: Patient reported a mild decrease of sensation with digital palpation over the ball of her feet and plantar surface of all ten toes. Plantar aspect of the 2nd and 3rd metatarsophalangeal joints was reportedly moderately tender on palpation. Heels were not painful.

I. Interventions: The patient was seen for 6 physical therapy sessions over a 3-week period. Ultrasound to plantar aspects of 2nd and 3rd metatarsophalangeal joints, following treatment protocols outlined by Cameron.[16] A 2003 Cochrane database systematic review conducted by Crawford et al.[17] determined that there is limited evidence that ultrasound therapy for heel pain is associated with better outcomes than no treatment and control therapies such as stretching exercises. "Low Dye" taping of both arches was done to relieve stresses on plantar fascia induced by weight-bearing. A randomized, prospective study completed by Lynch et al.[18] in 1998 showed that taping and orthoses were more effective than either anti-inflammatory or modalities for the treatment of plantar fasciitis. Home program included ankle inversion and eversion with towel on the floor; toe flexion/extension with towel gathering, 3 times 10 repetitions each to be done once-a-day.

J. Contrast baths: On the fourth visit patient was given verbal and written instructions for contrast baths with the goal of alleviating pain. To date there are very few studies that have focused on the effectiveness of hot–cold water immersion for the reduction of pain.[19-20]

K. Outcomes: Patient reported on the fourth visit that bilateral foot pain had reduced by 10 to 20%. The arch support tape seemed to bring most of the relief. She returned to her physician after the sixth session, at which point her foot strength had returned to normal in all directions except for plantar flexion (2/5 bilaterally). She was very compliant with her home exercise program.

Phase 2. Diagnosis: Bilateral metatarsalgia

A. History: One month later, the patient had been fitted with orthotics and returned on her physician's recommendation for an additional six sessions.

B. Posture/Observation: On observation the patient's stood without any abnormalities.

C. Gait: Patient was assessed in three directions and appeared to walk normally.

D. Range of motion: Active and passive range of motion (ROM) of feet and knees were again within normal limits and pain-free.

E. Strength: Manual muscle testing found strength to be normal except for ankle plantar flexion, still 2/5 bilaterally.

F. Palpation: Plantar aspect of the 2nd and 3rd metatarsophalangeal joints was still moderately tender on palpation. Heels were not painful.

G. Physical Therapist Diagnosis: Based on the moderate tenderness of the metatarsal heads, working hypothesis was bilateral metatarsalgia.

H. Interventions: Low intensity ultrasound, soft tissue mobilization, low dye taping, use of metatarsal pads, and general conditioning exercise program were initiated.

I. Outcomes: After 6 visits, there were minimal subjective improvements in foot pain. Patient began complaining of moderate left knee pain, 6/10 on VAS.

Phase 3. Diagnosis: Anterior Left Knee Pain

A. History: On the third visit of the second series of treatment for her feet, patient presented an additional prescription from an orthopedic surgeon to address her left knee pain, which had insidiously appeared and was worsening. The diagnosis was "anterior knee pain", to be treated with a "closed chain program", twice-a-week for three weeks.

B. Examination: Pain-Patient described her knee pain as "a burning sensation and tightness", which she rated at 8/10 (VAS).

C. Observation: The patient's standing posture observed from the anterior, lateral and posterior aspects was again normal.

D. Gait: Patient was wearing a neoprene knee sleeve and walked without abnormality.

E. Range of motion: Her knee ROM was normal, whether active, passive or accessory.

F. Palpation: There was no detectable tenderness upon palpation on or around the patella, and patellar tapping was painless.

G. Strength: Her knee strength was rated as normal (5/5).

H. Girth Measurement: Measured with a vinyl tape ribbon, her knee mid-patellar girth was 41.5 cm on the right, vs. 40.5 cm on the left. Validity and inter rater reliability of circumferential measurements obtained with a tape measure have been found to be high (ICCs ≥ .98).[21]

I. **Physical Therapy Diagnosis:** Because of the mild effusion of the knee and the reported knee pain, the diagnosis was internal knee derangement with synovitis.

J. **Interventions:** The sessions addressed the knee and bilateral foot pain. The same strategies as outlined previously for treating the patient's feet were used, in addition to closed kinetic chain lower extremity strengthening exercises, and general conditioning exercises on a cycling ergometer.

K. **Outcomes:** At the completion of fourteen sessions, patient returned to the orthopedic surgeon reporting that her knee "still burned a little but was getting better". She was taking Naproxen (Roche Products Pty Limited) and had stopped taking Vioxx, "because she could not afford it". Report to the physician indicated that it was difficult to corroborate her complaints with tangible objective findings, including absence of reproducible symptoms. Recommendation to discontinue physical therapy for lack of progress was made.

Phase 4. Diagnosis: Right hip pain

A. **History:** The patient returned two months later, with a referral from the same orthopedic surgeon with a diagnosis of "Right Piriformis Syndrome", with instructions to perform "hip stretching and conditioning", twice-a-week for three weeks.

B. **Examination:** Patient reported having had insidious right hip and right-sided low back pain over the past six months. She was still working full-time as sign coordinator for a department store. She reported her pain as moderate to severe, 5-6/10 on VAS scale. She was taking four Aleves a day.

C. **Posture/observation:** Observed from three sides, the patient stood with a swayback, mild lumbar hyperlordosis, and bilateral genu recurvatum.

D. **Strength:** Quadriceps, hamstrings and gastrocnemius/soleus muscles tested 5/5.

E. **Deep tendon reflexes:** DTR's for right Achilles and right medial hamstring were depressed (=1).

F. **Range of motion:** Was within normal limits in lower extremities, whether movements were physiological or accessory.

G. **Neural tissue dynamics:** Straight leg raise reached 90 degrees bilaterally without symptoms, either in the legs, the hip, or the low back.

H. **Palpation:** There was no detectable tenderness in the lumbar or lumbosacral segments and questionable tenderness in the right sacro-sciatic notch or over the piriformis/gemelli group.

I. **Physical therapist diagnosis:** Because of presence of right-sided low back and hip pain, as well as depressed Achilles' and medial hamstring DTRs, the diagnosis was formulated as a possible S1 lumbar nerve root entrapment.

J. **Interventions:** Spinal flexion exercises and lumbar stabilization exercises. Lower abdominal muscle strengthening according to Sahrmann's protocol. Set up home exercise program. Patient had four treatments.

K. **Outcomes:** On the third visit, patient "was still hurting; not feeling any better". Palpation detected minimal, if not non-existent soft tissue tenderness, or muscular hyper tonicity, anywhere along the lumbar make it tighter or lumbo-sacral segments. On the fourth visit, patient reported feeling "maybe a little better". She had seen a chiropractor who had performed a spinal adjustment because "her right hip was higher". She also reported that she woke up around 2 am every morning, with pain "crawling up the right side of her back".

L. I was unable to corroborate patient's complaints with any tangible findings. My hypothesis at that point was that patient's symptoms were possibly psychogenic. She still moved well, transferred without any difficulty, and walked without noticeable abnormalities.

Phase 5. Diagnosis: Right sciatica

A. **History:** Seven months after her initial referral, the patient returned with a prescription from her primary care physician with a diagnosis of "sciatica". An MRI of her lower spine had been recently performed without findings. She had a prescription for Vicodin 500mg (hydrocodone/acetaminophen, Knoll Labs, Mt. Olive, NJ, U.S.A.), which she was taking sporadically. She reported having fallen at work a month before, when her left knee buckled under after she stood up from her chair and walked away from it.

B. **Examination:** Patient's chief complaint was a moderately severe (7-8/10 on VAS) to severe ("sometimes a 10/10") deep burning pain along the posterior aspect of the right hip and the posterior thigh. She was not sleeping well because of pain, never more than two hours at a stretch. Symptoms were aggravated by sitting, standing, and sneezing (the latter provoked burning pain in the posterior right thigh).

C. **Posture/Observation:** Patient stood with the same swayback described earlier, lumbar hyperlordosis, and bilateral genu recurvatum.

D. **Gait:** Although her primary complaint was right hip and thigh pain, patient exhibited a gait abnormality with a strong left dipping limp: she locked her left knee into hyperextension throughout the stance phase.

E. **Balance:** Tested in standing with her feet together and her eyes closed, the patient had a Romberg's sign, being unable to stand more than 5 to 6 seconds without losing her balance.

F. **Strength:** Strength appeared normal throughout both lower extremities except for the left quadriceps, which was weak (2+ to 3/5).

G. **Deep Tendon Reflexes (DTRs):** She was bilaterally hyperreflexic (3+ to 4) in the quadriceps, as well as the biceps brachii, and brachioradialis muscles (?). Achilles DTR was absent on the right.

H. **Range of motion:** Lumbar spinal ROM in standing was within norms in all directions and painless, even with sustained overpressure in flexion, extension, or side-bending.

I. **Neural tension testing:** Straight leg raise test was bilaterally normal at 80º.

J. **Palpation:** Direct and firm palpation/mobilization of her spine failed to reproduce right hip or leg symptoms. The right sacro-sciatic notch was questionably tender on palpation, and her piriformis/gluteal muscles felt normal.

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K. Diagnosis: Symptoms were not consistent with common mechanical back, hip problems, or common sciatic nerve irritation. They were neither severe, nor irritable, but were unrelenting, chronic, and were seemingly getting worse. The patient was frustrated and despondent over her long-standing problems. Her hyperreflexia, gait abnormality, poor balance, and bilateral foot symptoms were evocative of an insidious neuropathy. Traditional physical therapy strategies had not provided her with any lasting relief.

L. Interventions: Signs and symptoms were unusual enough that her case was considered to be a "red flag", which warranted communication with her physician. In the mean time attempts to temporarily alleviate her hip and leg pain with soft tissue work, electrical stimulation, and gentle exercises.

M. Outcomes: During the course of this last intervention, patient reported temporary relief of right hip and thigh pain for 2 to 3 hours after each session. A letter was sent to the patient's primary care physician outlining findings and recommendation to discontinue physical therapy. Patient saw her physician after the third physical therapy session. The physician had no feedback regarding the "red flag" letter. Objective findings still lead toward an upper motor neuron or central nervous system problem, possibly multiple sclerosis. Two weeks later, a second letter was sent, reiterating my concerns.

Phase 6. Diagnosis: Spinal Tumor

A. History: Patient returned to our office six weeks later after being evaluated by a neurologist. Patient reported that the electromyographic (EMG) test performed had been determined as "normal". Neurologist had given her a prescription for Neurontin (Gabapentin. Pfizer, NY, NY). Her primary care physician had also referred her to a pain management specialist (anesthesiologist) who performed a lumbar epidural injection. The procedure "helped somewhat" her low back pain. Her physician also had the patient tested for mercury poisoning and the test was negative.

During that same span of time, the patient had yet another prescription for physical therapy from her orthopedic surgeon with a diagnosis of "left ankle and left knee weakness". Since her objective signs had not changed, on the undersigned recommendation, patient sought the assistance of another neurologist, outside of her home territory. This neurologist requested a magnetic resonance imaging test (MRI), which revealed a mass between T9 and T10 vertebral bodies, located in the intradural extra medullary space of the spine (Figure1 & 2).

Phase 7. Surgical intervention and post-op course

A. History: A neurosurgeon excised the mass, subsequently diagnosed by a pathologist as a "schwannoma of benign nature" (Figure 3). Following surgery, the patient went home and was wheelchair-bound for three weeks. She walked with a walker for a week and a half, and returned to my office 7 weeks after her surgery.

B. Examination

C. Posture/Observation: Patient stood with a swayback, bilateral genu recurvatum, more pronounced on the left. She walked slowly without an assistive device, locking her left knee into hyperextension during stance, with a left Trendelenburg's sign, and had no push-off.

D. ROM: Was WNL throughout.

E. Strength: Quadriceps were weak at 3/5; Hamstrings were 4/5; gastroc/soleus groups were poor at 2-2+/5.

F. DTRs: Quadricipital DTRs were 3+; medial hamstrings 2+ to 3; Achilles' 2 on right and absent on the left.

G. Neural tissue dynamics: Straight leg raise was measured at 90º bilaterally.

H. Physical therapist's diagnosis: Post spinal cord compression paraparesis.

I. Intervention: Patient was treated for a total of 24 sessions over three months. Her program consisted of progressive strengthening exercises for her lower limbs, balance and proprioceptive exercises, cardio-vascular conditioning, and a home exercise program (HEP). She actively participated in her care, was faithful to her HEP, and did not miss any sessions.

J. Outcomes: Patient reported feeling 75 to 80% better strength-wise. She was sleeping well, through the night, but her feet still "cramped" frequently, and both hands felt tight and achy for 10 to 25 minutes every morning. Her balance was fair to good; she could walk for one hour, and returned to work 128 days after her surgery. When I visited her at her house in January 2006 to obtain a signed informed consent form for writing this case report, she revealed that she was doing well and was enjoying a normal life. Her spinal and lower extremity ROM was normal and pain free, and her back and leg pain at rest was 0-1/10 and 1-2/10 with physical activities involving walking. Patient had a near complete resolution of her motor and sensory deficits, abatement of her left lower limb, bilateral foot pain, and cramping of her hands.

Figure 1 Schwannoma at T_9-T_{10}, sagittal view.

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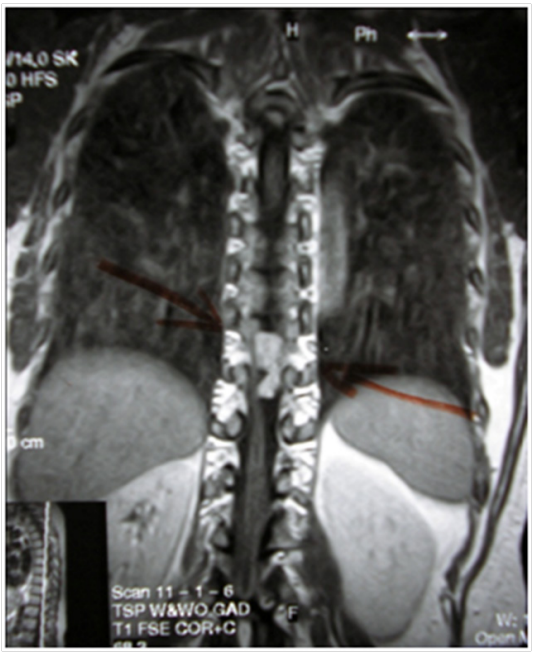

Figure 2 Schwannoma at T_9-T_{10}, frontal view.

Figure 3 Schwannoma following Laminectomies at T_8, TM_9, and T_{10}. Size of schwannoma = 32mm x 13.5mm

Discussion

The clinical presentation of spinal cord compression syndrome caused by a schwannoma is characteristically insidious. Neurologic symptoms are slowly progressive over several months and are not always preceded by back pain, as demonstrated in this case report. In our patient, the signs and symptoms of myelopathy evolved from a case of bilateral foot pain and vague sensory loss to a moderately severe upper motor neuron lesion within a time span of sixteen months. This case is representative of the complexity encountered in the diagnosis and management of these lesions.[22] The report described the decision-making process and clinical management in a patient who had complex pain manifestations, and findings for which there is a scarcity of scientific information. The implications of these findings for clinical practice include the fact that any time a patient presents with bilateral lower limb symptoms or back and leg pain without a positive straight leg raise test (SLR), clinicians should think about a non-musculoskeletal etiology.

When signs and symptoms do not quickly lead to a probable cause of pain or dysfunction, it is important to think about a differential diagnosis.[23] According to Martinez-Lage et al.[24] bilateral leg symptoms in a patient is the most important clinical finding that might indicate a spinal neoplasm, followed by motor and reflex impairments, and finally by the absence of a positive straight-leg raise test. Had we been aware of these facts, there were two findings which my colleague and I could have investigated when this patient was initially referred: the bilateral weakness of her foot plantar flexors (2/5) and her bilateral mild to moderate foot pain, especially at night. Otherwise, the presentation of this patient for each of the first three times she was referred to our office did not raise concerns about the possibility of a non-musculoskeletal cause of her symptoms. The evidence was rather sparse and of poor quality because her symptoms were non-specific: e.g., diffuse bilateral foot pain, then "burning and tightness" of the right knee, which were not reproducible with palpation or manual examination; insidious onset of low back pain and left leg pain, which I could not reproduce with either active movements, direct palpation of the spine, hip or knee, or with the straight leg raise test.

Suspicion that this patient had a serious problem came only when she returned with her fourth referral. Her symptoms were dramatically different than they had been in the past, such as her gait abnormality, walking with a dipping left limp and locking her knee in a marked recurvatum from foot strike to end of stance phase. Her hyperreflexia in all extremities, her weak quadriceps, her precarious balance, and her diffuse lower limb numbness and tingling lead to the suspicion that she was developing a demyelinating disease such as multiple sclerosis, or a neuropathy of toxic origin. Presence of a spinal cord lesion was not suspected, since there was no detectable tenderness at the thoracic level, and no spinal deformity. A study by Mehlman et al.[25] notes that patients with spinal neoplasms commonly exhibit spinal deformities and this patient did not have a scoliotic curve.

A final point may help determining a differential diagnosis when patients present with atypical lower limb and low back symptoms. In a recent study of signs and symptoms used to differentiate low back pain of a musculoskeletal origin from a potentially more serious non-musculoskeletal condition in a 12-year-old girl, Fritz and Kelly.[26] discovered that to make a diagnosis of musculoskeletal back pain (i.e., disk herniation), the most important finding to help rule in the diagnosis was the presence of unilateral leg pain, carrying a specificity of 1.0. According to Sackett et al.[27] tests that have high specificity are useful for ruling in a diagnosis when the test is positive. The straight-leg-raise test had a high sensitivity 0.88. Tests that have high sensitivity are useful for ruling out a diagnosis when the test is negative,24 indicating that, if the straight-leg-raise test is negative, the chance of a disk herniation decreases. On the other hand, considering tests for spinal neoplasms, the most important finding that would help to rule in this diagnosis would be the presence of motor weakness, because this finding has a high specificity (0.94), as well as bilateral leg pain with a specificity of 0.82. Impaired reflexes have a lower sensitivity of 0.69, but their presence might help ruling in a diagnosis of spinal neoplasm (Table 3).

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Table 3 Physiological outcomes

Goal(s) Physical Therapist's or Pt's	Time Frame	Initial Outcome	Final Outcome	Explanation
Dx#1:Plantar Fasciitis - Alleviate Foot Pain - Improve Walking	03/13/02	- Temporary relief of foot pain for ½ day after treatment	"Feet feel ~ 10 - 20% Better" Ankle strength 5/5 R, 4/5 L, except for PF = 2/5 bilaterally	- Suspicion that patient's foot pain is possibly psychogenic
Dx#2:Patello-Femoral Syndrome - Reduce Knee Inflammation - Strengthen Rle	05/13/02	- "Knee still burns a little; stiff, but getting better"	- No tangible findings corroborating pt's knee symptoms Both feet still sore. - R hip & LB pain "May be a little better"	- Patient walked Without limping or compensatory movements. - Knee Sx's were not reproducible.
Dx#3:Piriformis Syndrome -Reduces1nerve Root Irritation - Alleviate Lbp	08/16/02	- No change in subj Sx's (LBP=7/10)	- Saw a Chiro 9/18 because right hip was "higher". No change with chiro treatment	- Suspicion that psychogenic Sx's persisted. - No objective abnormalities.
Dx#4:Right Sciatica - Alleviate Rle Pain - Strengthen L Knee	10/21/02	- RLE pain better for 2-3 hours after PT	- N/A. "Red flag" letter to primary MD	- Dramatic change in Sx's, not consistent with "classic" sciatica. - Aberrant Neurological Sx's
Dx#5:Left Quadriceps Insufficiency. - Strengthen L Knee And L Ankle	12/30/02	- RLE pain worsening. - Tested for mercury poison: negative - Awakens 2-3 x/night w pain	- Patient seeked consult with new neurologist because of lack of response from PCP re. Red Flag letter.	- Patient unsatisfied with management from PCP or from neurologist. - Patient's frustrations worsening

Conclusion

Spinal Schwannomas are uncommon and can cause compressive neurologic symptoms affecting both lower limbs, which are usually insidious in onset. This case report is representative of the complexity encountered in the diagnosis and management of lower limb pain and it demonstrates the need for physical therapists to listen to a patient's complaints, even when these do not always make sense objectively. Clinicians need to perform a comprehensive neurological examination whenever patients report bilateral limb symptoms, even if they are as common and distal as foot pain. They also need to develop proficiency at interpreting the best available evidence related to diagnostic tests.

Finally, the clinical findings highlighted in this case suggest some directions for future work and research on the topic of spinal neoplasms and their repercussions, especially at the thoracic level. Scientific information on cervical and lumbar problems is plentiful, whereas studies of the thoracic region are scarce.[20]

Acknowledgments

None.

Conflicts of interest

None.

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