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Back-Localized Restless Legs Syndrome–Like Symptoms Without Limb Involvement, Accompanied by Urinary Urgency and Generalized Heat Sensation, With Differential Responses to Dopamine Agonist Therapy and Somatosensory Stimulation: A Case Report

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Case Report

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Abstract

Background: Restless legs syndrome usually presents with unpleasant sensations and an urge to move the lower limbs, typically worsening at rest and at night and improving with movement. Symptoms localized to the back without limb involvement are rare. Autonomic symptoms have also been reported in association with restless legs syndrome, but the temporal relationship between back-localized symptoms and autonomic-related symptoms remains poorly characterized.

Case presentation: We report the case of a 50-year-old man with restlessness and discomfort localized to the interscapular region, without limb involvement, accompanied by urinary urgency and a generalized heat sensation. These symptoms occurred synchronously 30–60 minutes after sleep onset and were temporarily relieved by movement. Treatment with ropinirole completely suppressed all three symptoms based on the patient's report. After switching to acupressure mat therapy as a non-pharmacological intervention, the back discomfort markedly improved, whereas urinary urgency and generalized heat sensation only partially improved.

Conclusions: This case suggests an atypical presentation within the restless legs syndrome spectrum, consistent with restless back syndrome, accompanied by symptoms suggestive of autonomic involvement. The differential response to dopaminergic therapy and somatosensory stimulation may indicate distinct but interacting neural mechanisms underlying somatosensory and autonomic-related symptoms. Recognition of such atypical presentations may help clinicians avoid missed diagnoses and consider appropriate treatment strategies.

BACKGROUND

Restless legs syndrome (RLS) is a sleep-related movement disorder characterized by unpleasant sensations accompanied by an urge to move, typically worsening during periods of rest, improving with movement, and showing a circadian pattern with predominance in the evening and night.[1] Although symptoms most commonly occur in the lower limbs, atypical presentations involving non-limb regions, including the trunk, have also been reported. Cases localized to the back without any limb involvement are particularly rare.[2–5]

In addition to sleep disturbance, autonomic dysregulation has been suggested in RLS. Clinical presentations in which autonomic symptoms, such as urinary urgency and thermoregulatory disturbances, occur in temporal association with abnormal sensations remain insufficiently characterized.[6–7]

We report a rare case of back-localized RLS-like symptoms without limb involvement, accompanied by synchronous urinary urgency and generalized heat sensation, and describe differential responses to ropinirole and somatosensory stimulation.

CASE PRESENTATION

A detailed history of the patient's symptoms and treatment course was obtained through an online interview conducted by Yumiko Higami, M.D., and Seiji Nishino, M.D., Ph.D., both board-certified sleep specialists, on May 20, 2026 (17:00–18:05). Additional information was subsequently obtained via email from the patient. The clinical course and treatment responses in this case are summarized in Fig. 1.

The patient was a 50-year-old man. His past medical history included major depressive disorder at the age of 25, which achieved remission after 2–3 years of treatment with paroxetine. At approximately 33 years of age, he was diagnosed with cervical disc herniation; however, at present, he reported only mild neck pain without any apparent sensory deficits, motor weakness, or other neurological abnormalities. Additional comorbidities included chronic gastritis, gastroesophageal reflux disease, and mild glaucoma. He was not receiving any medications for gastrointestinal conditions and had been using latanoprost ophthalmic solution (0.005%) for glaucoma since the age of 47. His family history was notable for nocturnal lower limb discomfort in his mother that improved with movement, suggestive of restless legs syndrome (RLS), although no formal diagnosis had been established.

The symptoms initially appeared around 2018. Approximately 30–60 minutes after sleep onset, the patient experienced a restless, uncomfortable sensation localized to the interscapular region, accompanied by an urge to move the back or body. The symptoms were temporarily relieved by turning over or stretching but tended to recur easily, usually resolving spontaneously within 1–2 hours. Occurrence during the daytime was rare, and symptoms did not appear during daytime naps. The patient habitually took a 20–30-minute nap after lunch on weekdays, during which no symptoms were reported. During the first 2–3 years, symptoms occurred approximately once every few months, increasing to 1–3 times per week during symptomatic periods.

In addition to the back symptoms, urinary urgency and a generalized heat sensation occurred as a consistent symptom cluster. Urinary urgency was frequent, with a need to void as often as every 10 minutes during severe episodes, although the voided volume was small. Urination provided temporary relief lasting 10–30 minutes but did not completely resolve the symptoms. All three symptoms—the back discomfort, urinary urgency, and heat sensation—appeared simultaneously within 30–60 minutes after sleep onset. Urological evaluation based on patient-reported symptoms revealed no dysuria, hematuria, fever, lower abdominal or pelvic pain, or post-void residual sensation. There were also no symptoms suggestive of lower urinary tract dysfunction, such as weak stream or difficulty voiding. Within the limits of the patient's report, there were no findings suggestive of infection or prostatic disease.

Regarding lifestyle factors, the symptoms tended to worsen with caffeine intake. The patient habitually consumed coffee twice daily, in the morning and at lunch. Switching to decaffeinated coffee resulted in symptom improvement within 1–2 weeks, whereas resumption of regular coffee led to recurrence within one week. Alcohol consumption also occasionally exacerbated symptoms. The effects of exercise were biphasic: moderate exercise alleviated symptoms, whereas intense training, such as preparation for a 100-km marathon, worsened symptoms and contributed to insomnia. No effects were observed with

commercially available cannabidiol (CBD). The use of tetrahydrocannabinol (THC)-containing products legally available in California induced drowsiness; however, their effects on symptoms were inconsistent, with both improvement and worsening observed.

From around March 2022, symptoms began to occur almost nightly, leading to sleep deprivation and increased stress, prompting medical consultation. A blood test was performed to evaluate suspected atypical RLS, and no abnormalities in iron metabolism were identified. Laboratory data from April 26, 2022 (patient-provided) were as follows: creatinine 0.82 mg/dL, serum iron 152 μg/dL, total iron-binding capacity 331 μg/dL, ferritin 140 ng/mL, thyroid-stimulating hormone 1.5 μIU/mL, glycated hemoglobin 5.6%, and vitamin B12 532 pg/mL. Urinalysis on the same day (patient-provided) showed negative results for glucose, occult blood, nitrites, leukocyte esterase, and protein, with a specific gravity of 1.01.

Administration of ropinirole 0.25 mg, a dopamine agonist, one hour before bedtime resulted in complete patient-reported suppression of the back discomfort, urinary urgency, and generalized heat sensation, with the patient reporting the absence of symptoms. A dose of 0.50 mg was occasionally required in situations associated with symptom exacerbation, such as alcohol intake or intense physical exertion. No signs suggestive of augmentation—such as earlier onset, increased severity, symptom spread, or increased dosage requirement—were reported. Additionally, no adverse effects, including excessive daytime sleepiness, nausea, or impulse control disorders, were noted. The patient did not report adverse events, including during periods of concomitant alcohol or THC use or when the dose was increased to 0.50 mg.

Although the patient achieved satisfactory symptom control with dopamine agonist therapy, he expressed a preference for non-pharmacological management, as he wished to avoid pharmacological treatment. Based on a suggestion from his spouse, he began using an acupressure mat (ShaktiMat®) in January 2026. The device consists of a mattress approximately 78 × 43 cm in size, with numerous evenly distributed plastic protrusions designed to provide cutaneous pressure stimulation. The patient applied the mat directly to the skin over the back, lower back, and upper gluteal region for 20 minutes before bedtime. This intervention resulted in near-complete resolution of the back discomfort. Even on days when symptoms occurred due to non-use, approximately 10 minutes of application led to symptom relief. Ropinirole was discontinued without tapering at the initiation of acupressure therapy, and no combination therapy was used.

In contrast, urinary urgency and generalized heat sensation persisted. According to the patient's subjective assessment, the frequency of symptoms decreased by approximately 60–70% for urinary urgency and 20–40% for heat sensation, while the intensity decreased by approximately 70–80% and 10–20%, respectively. These symptoms continued to occur within 30–60 minutes after sleep onset, similar to the previous pattern. The patient reported high satisfaction with acupressure-based management.

Subjective assessments were conducted at three time points: before treatment (when symptoms occurred daily), during ropinirole therapy, and during acupressure therapy. The questionnaire was

administered on May 13, 2026, and pre-treatment and treatment-phase scores were based on retrospective recall. Scores were as follows: International Restless Legs Syndrome Study Group Rating Scale (IRLS): 26 (pre-treatment), 8 (ropinirole), 8 (acupressure); Pittsburgh Sleep Quality Index (PSQI): 7, 2, 2; Insomnia Severity Index (ISI): 14, 3, 3; Epworth Sleepiness Scale (ESS): 10, 8, 8. Since IRLS is originally designed for lower limb symptoms, the questionnaire was adapted in this case by substituting limb-related items with back symptoms. The scores during ropinirole and acupressure treatments were identical, indicating comparable subjective improvement.

DISCUSSION

The notable features of this case are as follows: (1) the patient presented with RLS-like symptoms localized to the back (interscapular region) without limb involvement; (2) urinary urgency and a generalized heat sensation, considered symptoms suggestive of autonomic involvement, occurred synchronously with the back symptoms 30–60 minutes after sleep onset; (3) all three symptoms were suppressed by ropinirole, whereas acupressure therapy markedly improved the back discomfort but only partially relieved the symptoms suggestive of autonomic involvement; and (4) questionnaire-based assessments showed comparable subjective improvement during ropinirole treatment and acupressure therapy.

The back symptoms in this case exhibited clinical features consistent with the diagnostic characteristics of typical RLS, including worsening at rest, temporary relief with movement, and predominance at night.[8] Therefore, this case may represent an atypical presentation within the RLS spectrum, consistent with restless back syndrome (RBS), characterized by localization to the back without limb involvement. The correspondence between the clinical features of this case and the 2014 IRLSSG essential diagnostic criteria is summarized in Table 1. In addition, the complete temporal synchronization of urinary urgency and generalized heat sensation with the back symptoms, together with their concurrent suppression by dopaminergic treatment, suggests that somatosensory symptoms and symptoms suggestive of autonomic involvement may be linked, at least in part, through shared neural mechanisms.

Table 1
Concordance of this case with the 2014 IRLSSG essential diagnostic criteria.

2014 IRLSSG criterion	Findings	Assessment
(1) Urge to move the legs with unpleasant sensations	Urge present; symptoms localized to the interscapular region	Partially concordant
(2) Worsening during rest or inactivity	Symptoms occurred after sleep onset and worsened at rest	Concordant
(3) Relief by movement	Temporary relief with movement (turning, stretching)	Concordant
(4) Evening or night predominance	Symptoms occurred predominantly at night	Concordant
(5) Not solely accounted for by another condition	No clear alternative diagnosis identified; evaluation limited	Possibly concordant

This table summarizes the correspondence between the clinical features of this case and the five essential diagnostic criteria for restless legs syndrome proposed by the International Restless Legs Syndrome Study Group (IRLSSG) in 2014. Because the original criteria were developed for leg symptoms, symptom localization was adapted to the back in this comparative evaluation. Concordance was assessed as concordant, partially concordant, or possibly concordant based on the clinical findings. Although most criteria were met, symptom localization was atypical and exclusion of alternative diagnoses was limited.

In recent years, autonomic dysfunction in RLS has attracted increasing attention. Previous studies have reported enhanced sympathetic activity, altered heart rate variability, and augmented cardiovascular responses associated with periodic limb movements. Questionnaire-based studies have also demonstrated increased autonomic symptoms across a broad range of domains, including cardiovascular, gastrointestinal, thermoregulatory, and urinary functions.[9–10] The urinary urgency and generalized heat sensation observed in this case may therefore be interpreted as symptoms suggestive of autonomic involvement associated with RLS.

Furthermore, dopaminergic pathways are known to participate in the inhibitory regulation of micturition through the basal ganglia and brainstem, particularly via the pontine micturition center.[11–13] Reduced dopaminergic function is associated with bladder overactivity and urinary urgency, and similar urinary abnormalities are frequently observed in Parkinson's disease.[14–16] In the present case, the resolution of back discomfort following ropinirole administration, accompanied by the disappearance of urinary urgency and a generalized heat sensation, supports the possibility that these symptoms were integrally regulated through central dopamine-dependent neural networks.

In contrast, the therapeutic effects of the acupressure mat differed from those of the dopamine agonist: back discomfort improved markedly, whereas the effects on urinary urgency and generalized heat sensation were limited. One possible mechanism underlying symptom improvement with somatosensory input is a spinal sensory gating process consistent with gate control theory.[17–18] According to this theory, non-nociceptive input, such as tactile or pressure-related afferent signals, may

suppress the transmission of abnormal sensations through inhibitory interneurons in the dorsal horn of the spinal cord. Recent neurophysiological studies further support the importance of interactions between excitatory and inhibitory spinal dorsal horn circuits in the modulation of sensory transmission.[19–20]

In this case, the marked suppression of the back discomfort by sustained tactile-pressure stimulation from the acupressure mat suggests the involvement of somatosensory modulation mediated by such spinal sensory gating mechanisms. The characteristic relief of RLS symptoms with movement may also be understood within this same framework, as increased proprioceptive and tactile-pressure input could similarly suppress abnormal sensations. Thus, strong somatosensory input may reduce unpleasant abnormal sensations through a shared gating-based mechanism.

In addition, attentional redistribution may also have contributed, whereby strong sensory stimulation diverted attention away from the abnormal sensations.[21] However, although the acupressure mat showed a marked effect on the back discomfort, urinary urgency and generalized heat sensation persisted to some extent. This dissociation suggests that modulation driven by sensory input may act primarily on somatosensory processing, without sufficiently influencing autonomic-related systems.

Taken together, the symptoms in this case may be understood within a two-layer model: (1) somatosensory processing mechanisms at the spinal cord level, and (2) dopamine-dependent neural networks in the brain that regulate the autonomic nervous system. Whereas ropinirole may have influenced both systems, the acupressure mat may have acted mainly on the former, thereby producing the observed difference in treatment responses.

Recognition of atypical presentations within the RLS spectrum involving back-localized symptoms may be important for avoiding missed diagnoses and guiding appropriate treatment selection. Such cases may also provide new insights into the pathophysiology of the RLS spectrum.

This report has several limitations. First, differential diagnoses such as spinal disorders, medication-induced akathisia, and urological disease were not fully excluded. Second, no objective sleep assessment, such as polysomnography, was performed. Third, some questionnaires, including the IRLS, were originally designed for lower limb symptoms and therefore have inherent limitations when applied to this case. Fourth, the pre-treatment assessments were based on retrospective recall. Finally, the contribution of placebo effects and the natural course of symptoms cannot be fully excluded with regard to the effects of the acupressure mat. Future studies incorporating urological assessment (e.g., voiding diaries, urinalysis, and post-void residual measurement) together with objective sleep evaluation would be useful.

CONCLUSION

We report a case of back-localized RLS-like symptoms accompanied by synchronous urinary urgency and a generalized heat sensation. Ropinirole suppressed all three symptoms based on the patient's

report, whereas the acupressure mat markedly improved the back discomfort but only partially reduced the symptoms suggestive of autonomic involvement.

Non-pharmacological therapies using somatosensory stimulation may be considered a potential adjunctive treatment option for patients with suspected RLS spectrum presentations involving back-localized symptoms. However, given the limited exclusion of differential diagnoses and the lack of objective assessments, further studies are warranted.

PATIENT PERSPECTIVE

The patient reported that the nocturnal symptom cluster substantially disrupted his sleep and became stressful, particularly when symptoms occurred almost nightly. Although ropinirole provided satisfactory symptom control, he preferred to avoid long-term pharmacological treatment if possible.

After starting acupressure mat therapy, he reported being very satisfied because the back restlessness almost completely disappeared without medication. Although urinary urgency and generalized heat sensation persisted to some extent, he hoped that this non-pharmacological option would become known to other patients experiencing similar distress.

Declarations

Ethics approval and consent to participate
Ethical approval was not required for this single-patient case report in accordance with institutional policies.

Consent for publication
Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Availability of data and materials
The data supporting the findings of this case report are not publicly available due to patient privacy and confidentiality. Relevant anonymized information may be available from the corresponding author on reasonable request, where appropriate.

Competing interests
The authors declare that they have no competing interests.

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Clinical trial number
Not applicable.

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Figures

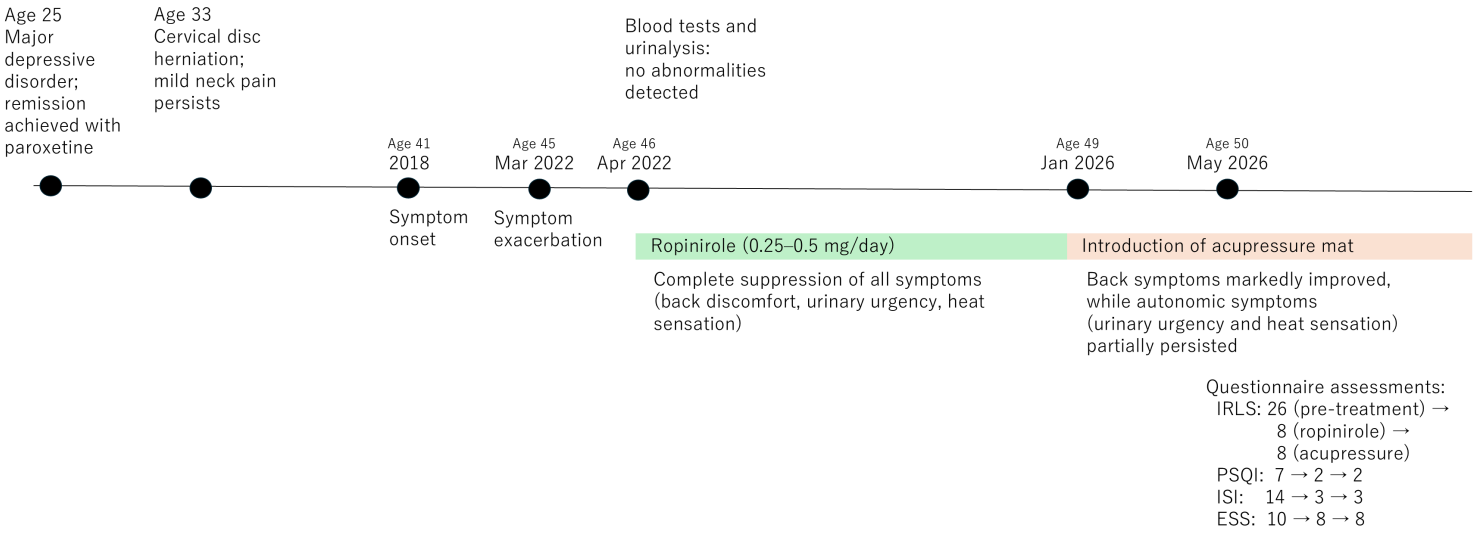


Figure 1

Timeline of clinical course and treatment responses.

This figure summarizes the patient's clinical course, including symptom onset, progression, and responses to ropinirole and acupressure therapy. Back discomfort, urinary urgency, and generalized heat sensation were completely suppressed during ropinirole treatment based on the patient's report, whereas acupressure therapy markedly improved back discomfort but only partially alleviated urinary urgency and generalized heat sensation. Questionnaire assessments at each time point are also shown.