

## **Psychogenic Gait: When It Is and When It Isn't – Correlating the Physical Exam with Dynamic Gait Data**

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### **Introduction**

Psychogenic gait problems are often difficult to identify with certainty. If an organic pathology is missed, the consequences are unfavorable. Conversely, prolonged medical work-up with unnecessary interventions can perpetuate the psychological component of a diagnosis associated with psychogenic gait. Four case studies are described – two pediatric and two adult. Each individual presented initially with a question of psychogenic gait; two of these cases also carried the diagnosis of reflex sympathetic dystrophy. In two cases (one adult, one pediatric), psychogenic gait was documented after comprehensive gait analysis. In the two other cases, psychogenic origin of the gait abnormality was actually unfounded after gait analysis. One of the latter cases ultimately led to referral for a spondyloarthropathy, which had not been previously diagnosed.

### **Statement of Clinical Significance**

Prompt and accurate determination of psychogenic gait problems can lead to an appropriate diagnosis and prevent unnecessary medical work-up as well as inappropriate costly pharmacologic or surgical interventions. Computerized gait analysis, when correlated with a physical examination performed by the same examiner, can assist in the assessment of this difficult group of patients.

### **Methodology**

In a three-month time period, four referrals were received in our gait laboratory from four different referral sources with the initial question of a possible psychogenic gait. The four referring physicians were a pediatrician, pediatric physiatrist, and two orthopaedic surgeons who primarily treated adults. The four patients underwent comprehensive gait analysis including split-view videography, detailed physical examination, Gillette Functional Assessment Questionnaire, lower extremity kinematics, multi-segmented foot kinematics, kinetics (including moments, powers and ground reaction forces), and surface electromyography. The two adult patients completed a standardized history form, while the parents of the two pediatric patients completed the history forms for them. Functional activities such as single limb balancing, tandem walking, toe and heel walking, hopping and running were videotaped, if each individual could perform them. In addition to the above test components, one patient (Case #3) also underwent testing using the Gross Motor Function Measure (Dimensions D and E), and the Berg Balance Scale. Another patient (Case #4) underwent fine wire electromyography of peroneus longus, peroneus brevis, and extensor hallucis longus on the left. Kinematic data were collected for a minimum of five trials using a 6-camera Motion Analysis Falcon 120 Hz HiRes™ system as each individual walked along a level walkway at a self-selected speed. After data reduction, findings were interpreted by the physical therapist who evaluated the patient and compiled in a written report. These cases were then discussed and further analyzed at a team meeting with the medical director (pediatric orthopaedic surgeon), motion analysis laboratory physical therapists, and engineer.

## Results

The following table contains patient demographics, characteristics and findings.

	<b>Case #1</b>	<b>Case #2</b>	<b>Case #3</b>	<b>Case #4</b>
	17 y.o. female	36 y.o. female	9 y.o. female	54 y.o. male
<b>Initial Diagnosis</b>	Chronic RSD	RSD left knee	Undiagnosed gait abnormality	Left foot pain w/ abnormal pronation
<b>Pertinent History</b>	Identical twin w/ JRA; mother brought 3-inch thick history	Prior knee surgery; 2 hours of aerobics daily; difference in abilities w/ elastic knee sleeve	Normal until 1 year prior; symptoms began after family moved; precocious puberty	Anxiety disorder w/ recent work modifications to accommodate pain
<b>Medications</b>	Numerous	Numerous	None	Numerous
<b>Physical Findings</b>	(-) neuro screen (-) RSD symptoms (+) la belle indifference • Normal physical findings	(-) neuro screen (-) RSD symptoms • Sensory/pain complaints with abnormal anatomical distributions	(+) neuro exam w/ Babinski & clonus • tight hamstrings • tight heelcords • pronated feet in standing	• pain & stiffness • ↓ ROM spine, knees, feet, toes • skin changes on soles of feet & toenails
<b>Functional Data</b>	Level 5 ambulator	Level 3 w/o sleeve Level 8 w/ sleeve	Level 10 ambulator	Level 10 ambulator
<b>Dynamic Gait Data</b>	Slow velocity w/ exaggerated movements	Exaggerated slowness w/ inconsistencies	Typical kinematic, kinetic patterns for spasticity	↓ anterior tilt; Kinematics consistent w/ contractures & pain
<b>Foot Kinematics</b>	Noncontributory	Noncontributory	Pronation bilaterally	No abnormal pronation; actually early cavus foot
<b>EMG</b>	Noncontributory	Noncontributory	Patterns consistent w/ spasticity	Prolonged firing of left foot evertors
<b>Diagnosis after CGA w/ Physical</b>	Psychogenic gait ? Munchausen by Proxy	Psychogenic gait ? Conversion Disorder	Spastic paraparesis of unknown etiology	Spondylo-arthropathy

## Discussion

A complete medical evaluation is essential in order to rule out organic etiology in patients with a suspected psychogenic gait. However, once this evaluation has been completed and medically unexplained impairments continue to persist, then a comprehensive gait analysis correlated with physical examination findings may assist physicians in the differential diagnosis. Objective documentation of discrepancies between physical/functional findings vs. kinematic/kinetic data can provide crucial information during difficult clinical decision-making. Accurate and timely assessment of psychogenic gait problems is critical because there is a strong positive correlation between duration of psychological symptoms and the time required to eradicate them.

## References

1. Hayes MW, et al., *Movement Disorders*, 14(6): 914-921, 1999.
2. Michelson JD, *Foot & Ankle International*, 21(1): 31-37, 2000.