“Toe-Walking in a Toddler… How Serious Can It Be?”

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- None

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History of Present Illness

- 4-year old girl born at 31.6 weeks twin gestation with normal growth and development presents to outpatient clinic with more frequent falls over the last 2 months.
- Started walking 12 months, but always toe-walking.
- Two months ago she started to fall more often. She stopped running and developed an unsteady gait and right leg pain. No upper extremity motor changes.
- No recent infection or fevers. No history of trauma.
- She is currently being potty trained and has occasional urinary accidents but never fecal incontinence.

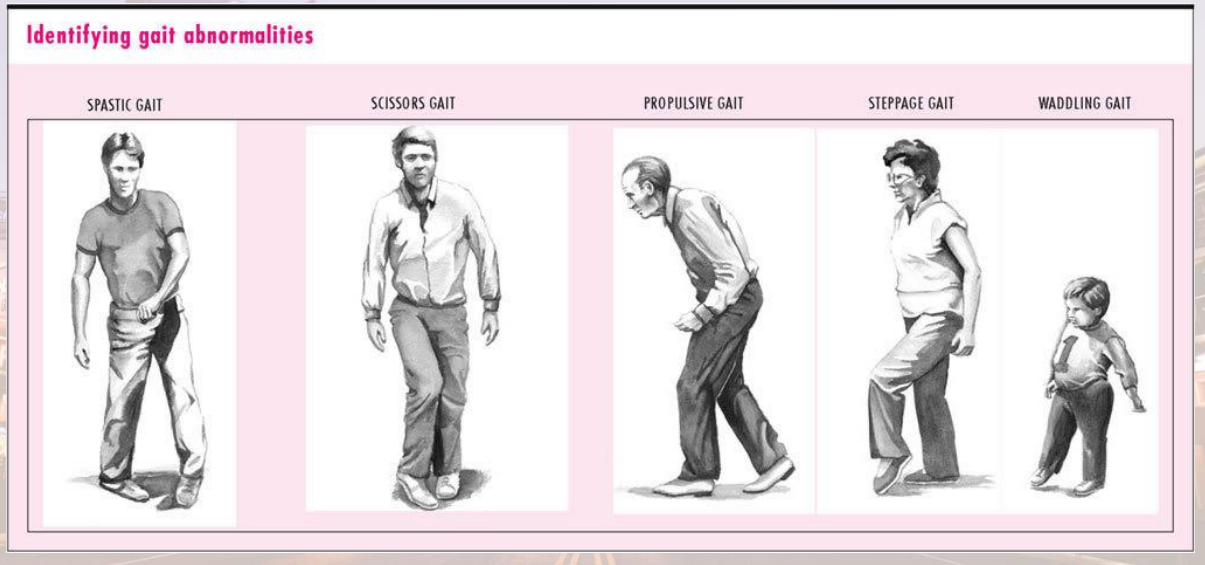
Review of Systems

- **Constitutional**: no significant weight loss, no fevers, no night sweats
- **HEENT** - **rhinorrhea/nasal congestion**, no cough
- **Cardiovascular**: No syncope or chest pain
- **Respiratory** - no cough or shortness of breath
- **Abdominal** - **constipation**, no nausea/vomiting
- **GU** – **potty training, occasional urine accidents**, no dysuria reported
- **Extremities** – **gait instability, toe-walking, right leg pain, in-toeing**
- **Skin** - no rashes
- **Neuro** - no change in speech or alertness.

Physical Exam

T 36.1, BP 96/54mmhg, HR 63 bpm, RR 24 breath/min, SPO2 95% RA

- **Gen:** well nourished child, playing on the exam table
- **Skin:** several small nevi, 2 small cafe au lait spots (back and thigh)
- **MSK:**
  - UE: 5/5 strength, normal tone and ROM
  - LE: tight heel cords and hamstrings R>L, increased tone, 5/5 strength.
  - Spastic gait
- **Neuro:** + Babinski sign. Sustained clonus on right foot. Non-sustained clonus on left foot. Normal sensation. Normal brachial, triceps, patellar reflexes bilaterally.



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One Liner

- Previously healthy ex-premature 4 year old female with subacute presentation of gait changes and leg pain with upper motor neuron findings on physical exam.

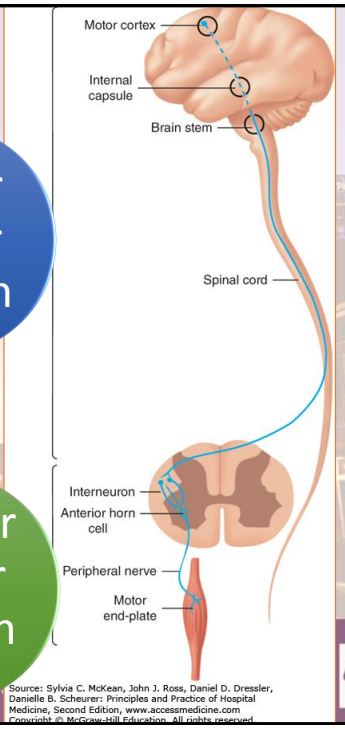
Localizing the Lesion

Upper motor neuron

- Hyper-reflexia
- Hypertonia
- Up-going Babinski

Lower motor neuron

- Hypotonia
- Hyporeflexia
- Atrophy
- Flaccid
- Fasciulations



Source: Sylvia C. McKean, John J. Ross, Daniel D. Dressler, Danielle B. Scheurer: Principles and Practice of Hospital Medicine, Second Edition, www.accessmedicine.com
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Differential Diagnosis

Acute	Sub-Acute	Chronic
• Infectious • Trauma • Inflammatory	• Infection • Inflammatory • Neoplasm • Neurodegenerative	• Neoplasm • Congenital • Structural

Work-up

LABS

IMAGING

Two Week Follow-up:

- Progression of symptoms / new physical exam findings:
  - unable to stand, reverted to crawling
  - Decreased strength in her right > left lower limb
  - Hyperreflexia in lower extremities

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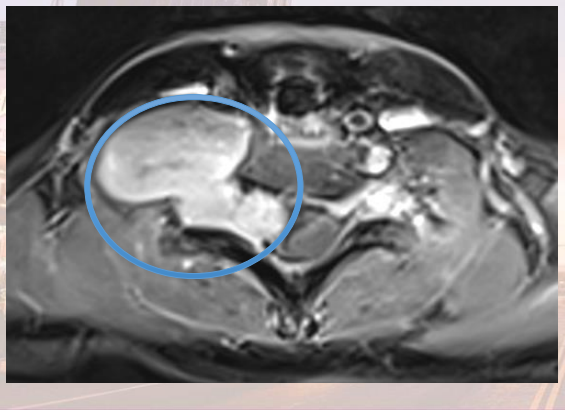
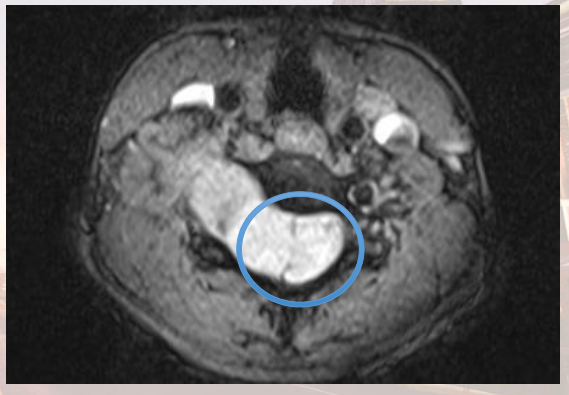
Further Work-up:

- MRI cervical spine and thoracic spine:

T2 WEIGHTED MRI



T1 WEIGHTED MRI POST CONTRAST



Large intradural and extradural mass arising from the right C7 nerve root with evidence of cord compression and extension into the right brachial plexus.

Recap

- The most alarming features were her **spastic gait, hyperreflexia and the Babinski sign**, which were suggestive of upper motor neuron pathology.
- These are long tract myelopathic findings, which are common in intradural-extramedullary tumors.

Most common intradural tumors:

•Schwannomas •Neurofibromas •Meningiomas

Neurofibromas

- Slow growing benign nerve sheath tumor
- Origin: Neuro-mesenchymal cells
- 90% present after age 30
- 10-20% present < 10 years old
- May be associated with neurofibromatosis.

Schwannomas

- Slow growing benign nerve sheath tumor
- Origin: Schwann cells
- Typically present in 3rd decade of life.
- Early age presentation of multiple schwannomas or neurofibromas may suggest a possible genetic syndrome.

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Clinical Course

- She underwent C6-C7 laminectomy with partial excision of tumor.
- Pathology revealed **spindle cell tumor with S-100 staining consistent with schwannoma.**

After resection:

- She was able to move her legs and walk again.
- After a short course of physical therapy, her toe walking resolved.

Toe Walking

- Prevalence is between 2-12% in children.
- Idiopathic toe-walking is a diagnosis of exclusion when it persists after the age of 3 years.
- It has been associated with neurologic deficits including cerebral palsy, global developmental delay and muscular dystrophy.

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Take home points

- When faced with upper motor neuron pathology, it is important to image all segments involving upper motor neurons especially if the deficits cannot be localized.
- Although toe walking may be common, it warrants a thorough work-up if it persists past 3 years old prior to diagnosing as idiopathic toe-walking.

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