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

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Disclosure of Financial Relationships

• None
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
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

Hyper-reflexia
Hypertonia
Up-going Babinski

Hypotonia
Hyporeflexia
Atrophy
Flaccid
Fasciulations
Differential Diagnosis

Acute
- Infectious
- Trauma
- Inflammatory

Sub-Acute
- Infection
- Inflammatory
- Neoplasm
- Neurodegenerative

Chronic
- Neoplasm
- Congenital
- Structural

Work-up

LABS

IMAGING

MRI Brain w/o contrast: Prominent mucosal disease in the ethmoid sinuses and minimal in the maxillary sinuses.

MRI Lumbar spine w/o contrast: normal

EMG normal nerve conduction but reduced motor unit potential activation.

Chem 8: normal

LFT: normal

WBC: 10.7
Hgb 13.4 / Hct: 38.4
Plt: 398

CPK 164 U/L (normal)

Aldolase: 61 U/L (normal)

LDH: 263 (normal)
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

Further Work-up:

- MRI cervical spine and thoracic spine:

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.

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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.
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.
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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References


