


APPROACH TO PEDIATRIC NEUROLOGICAL DISORDERS

DR. AMAL ABU LIBDEH
PEDIATRIC NEUROLOGY



INTRODUCTION

- A detailed history and a thorough physical exam are essential to reach an accurate diagnosis.
 - We will discuss 3 cases, initially thought to be a certain diagnosis, but digging deeper into the history and exam revealed a completely different diagnosis.
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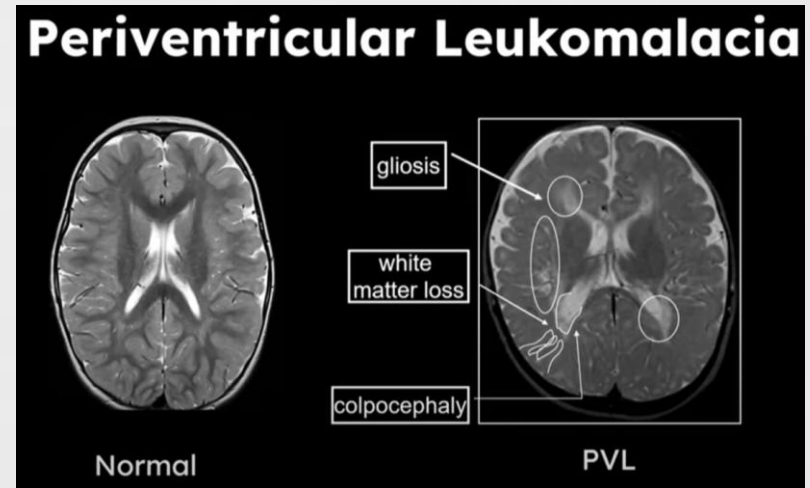


The image features a light gray background with a large, faint, circular pattern in the center. In the four corners, there are decorative red lines that resemble a circuit board or a network diagram, with small circles at the end of the lines. The text "CASE 1" is centered in a bold, black, sans-serif font.

CASE 1

DIPLEGIC CEREBRAL PALSY

- A common cause for toe walking.
- Children with CP present with increased muscle tone, decreased muscle strength, increased reflexes, and impaired balance and/or coordination.
- Gait is affected from the beginning, with toe walking being a common finding due to hypertonia in the plantar flexors. Also, knee flexion, hip flexion and adduction (scissoring).
- Imaging shows periventricular leukomalacia.
- Treatment usually follows the general approach : physical therapy, botulinum toxin injections, surgery, etc.
- Symptoms are typically static and improve with therapy.



DOPA-RESPONSIVE-DYSTONIA (DRD)

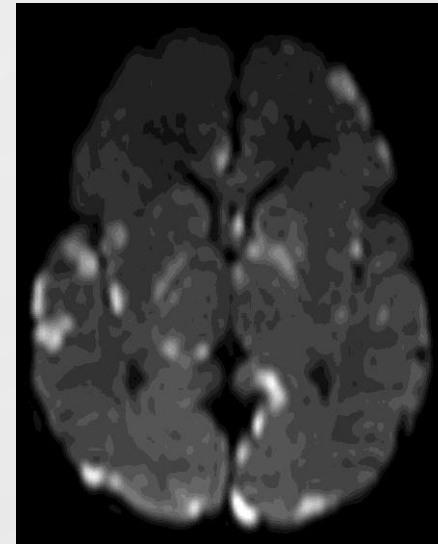
- DRD is estimated to affect 1 in a million people worldwide. It is likely underdiagnosed as it can be missed.
- The most common presenting symptom of DRD is a gait disturbance.
- Dystonia may start in the lower extremities, resulting in a tiptoe walking pattern with inward and upward turning of the feet.
- It shows diurnal variation of symptoms (with evening exacerbation). Early in the disease course, patients are symptom-free in the morning.
- Diagnosis is confirmed via genetic testing, with 3 known mutations:
 - GCH-1 (most common, AD), TH (AR), and SR (AR)

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CASE 2

BACTERIAL MENINGITIS

- Symptoms: fever, headache, vomiting, photophobia
- May be seizures, altered LOC.
- Exam shows altered LOC, irritability, with positive meningeal signs.
- Etiology: bacterial (*Streptococcus pneumoniae*, Influenza, *Neisseria meningitidis*), viral (Herpes simplex), others (Adenovirus, TB, etc.)
- Diagnosis through CSF analysis, bacterial culture, and viral studies (PCR).
- Treatment according to the suspected causative agent should be started empirically ASAP.
- Possible complications: hearing loss, hydrocephalus, permanent neurological deficits.



PEDIATRIC STROKE

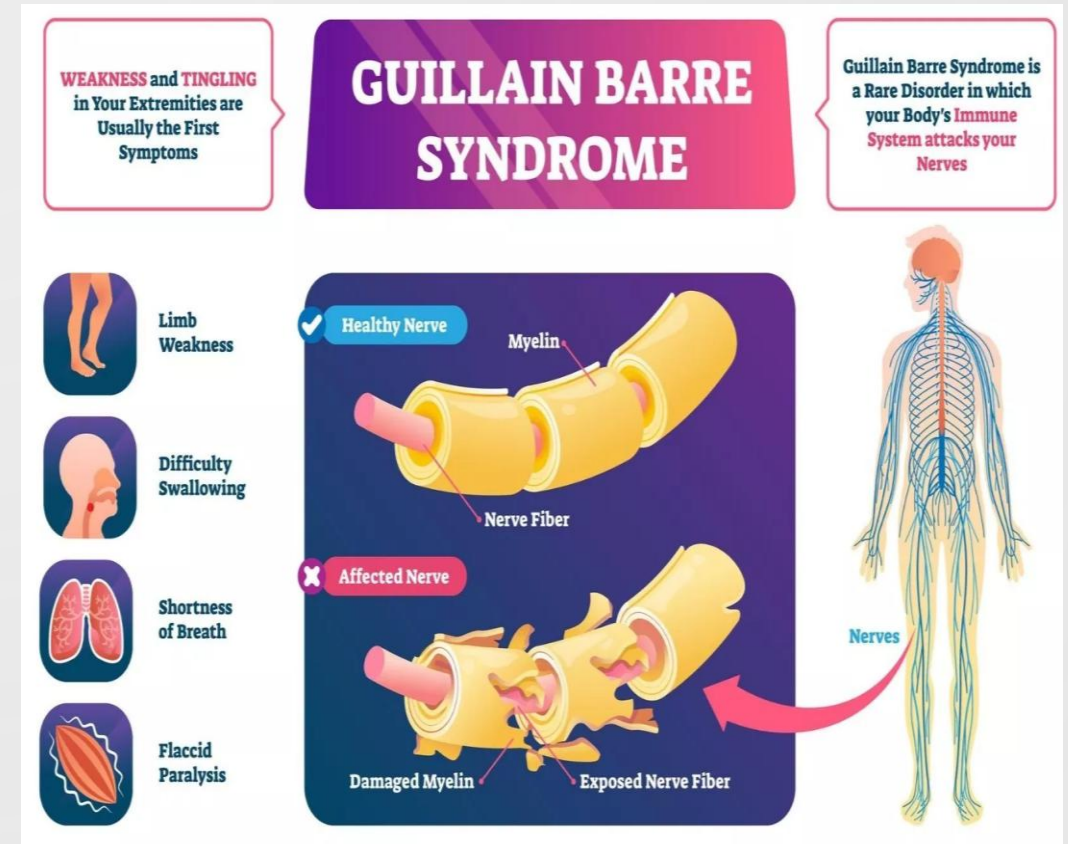
- Pediatric stroke is rare compared to adult stroke.
- Incidence: ~3 per 100,000 children per year.
- 5-30 % of pediatric strokes involve posterior circulation.
- Basilar artery strokes are extremely rare in pediatrics.
- Compared with adults, the outcome is more favorable despite a considerable delay in diagnosis and treatment.
- Viral infection that can cause basilar artery stroke in children
- Often dramatic –can mimic coma or encephalopathy
- Treatment options: conservative (supportive medical management with anticoagulation), vs t-PA, vs thrombectomy.

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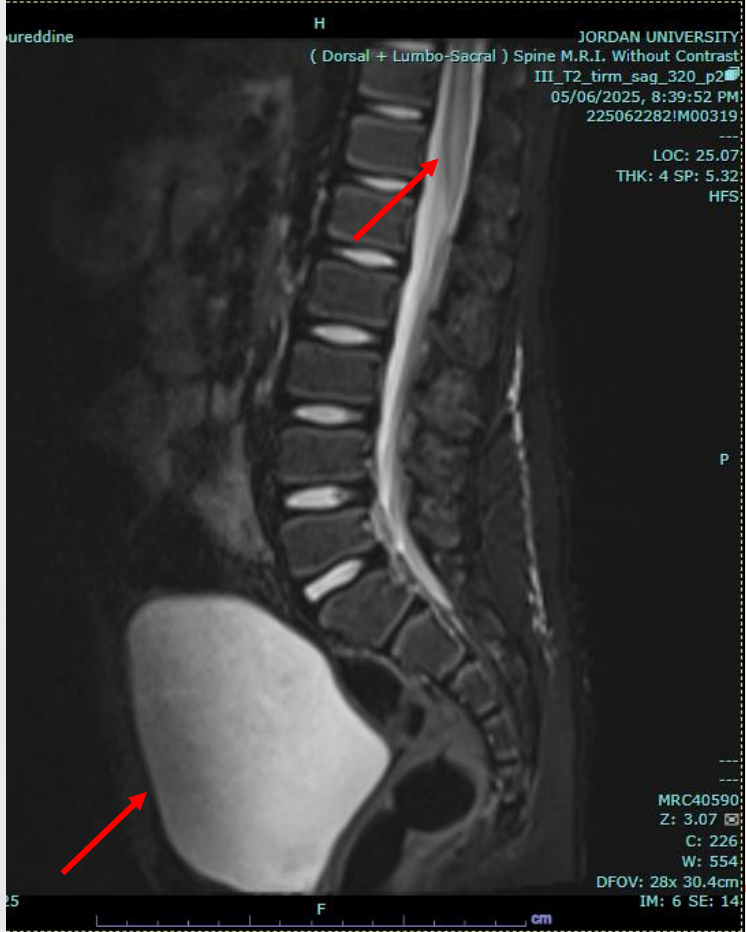
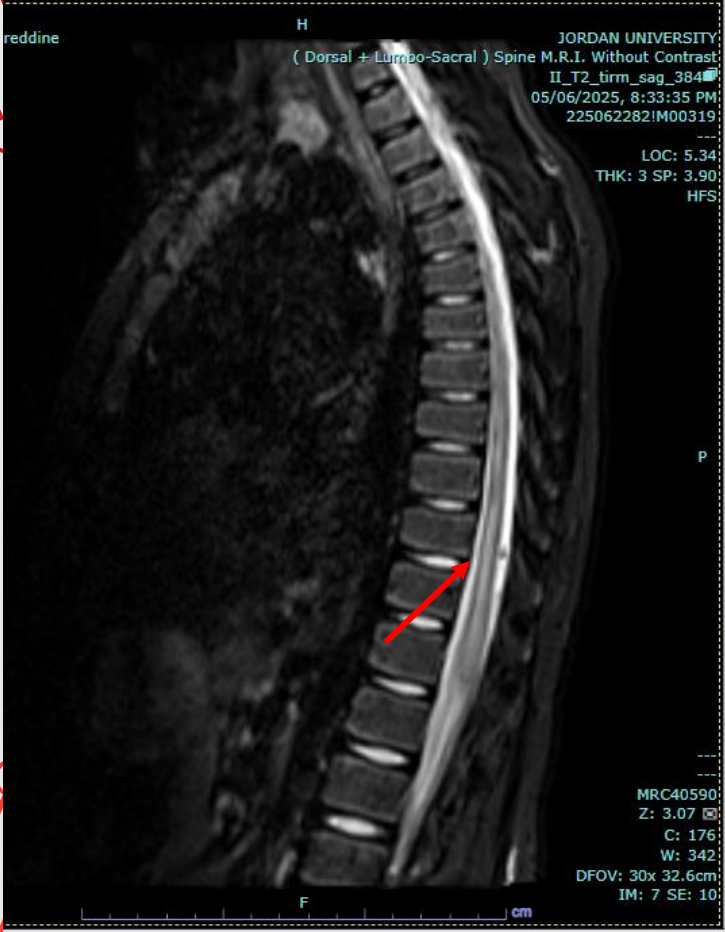
CASE 3

GULLAIN –BARRE SYNDROME

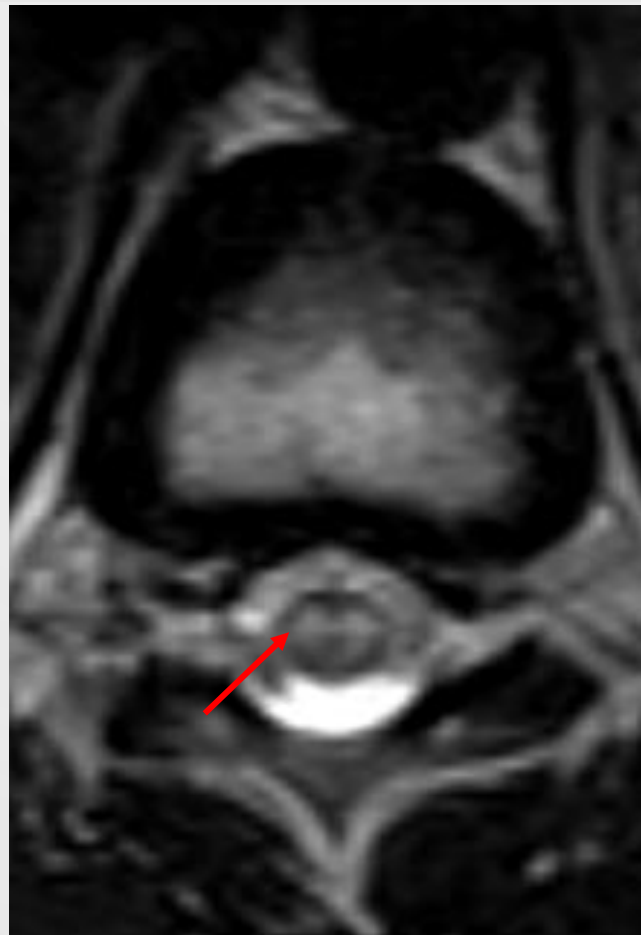
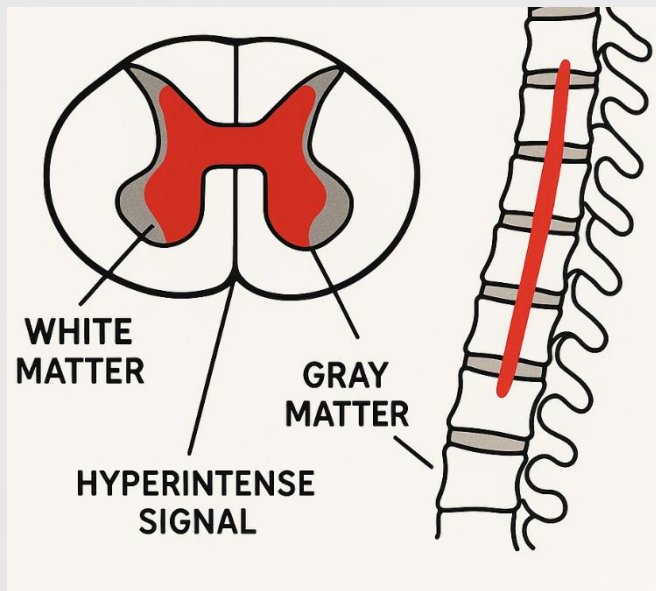
- It is an autoimmune-mediated inflammatory disease of the peripheral nerves.
- Common triggers: infections (most common is Campylobacter, also CMV, EBV, and Mycoplasma), immunizations(e.g. influenza vaccine), surgery, or trauma.
- Symmetric ascending weakness
- Paresthesia and mild autonomic dysfunction are common
- CSF: High protein, normal WBC
- MRI: Nerve root enhancement, no spinal cord lesions
- NCS/EMG: Demyelinating or axonal features
- Treatment is IVIG (not steroids) or plasma exchange.



MRI – Abnormal Cord Signal



H- sign

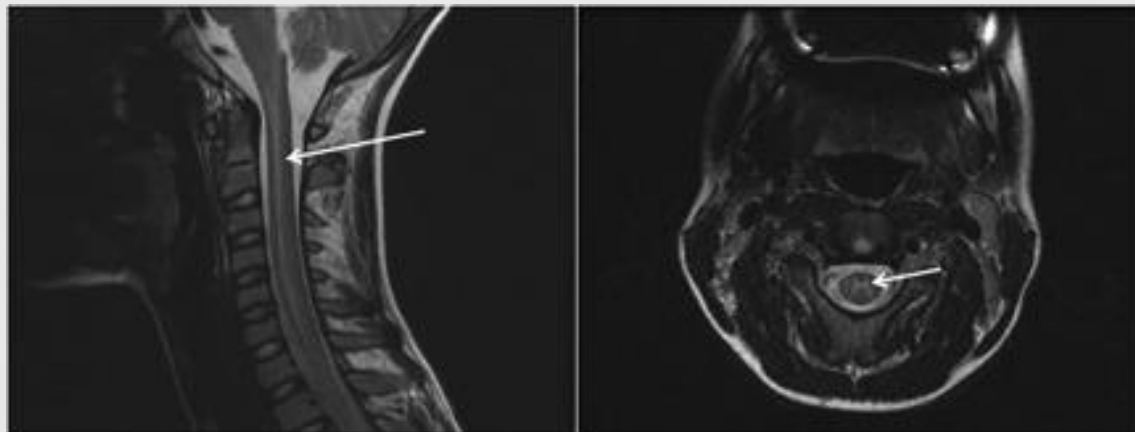


ACUTE FLACCID MYELITIS

- It is an acquired spinal cord disorder affecting anterior horn cells.
- It presents with the rapid onset of weakness in one or more limbs.
- It resembles polio and mainly affects children. First described in 2014.
- The median age is 6 years.
- Enterovirus EV-D68 is thought to be the main virus associated with this condition. Other viruses include EV- D71, and coxsackievirus.

ACUTE FLACCID MYELITIS

- **Investigations:**
- CSF: pleocytosis. (typically the virus cannot be detected in CSF)
- Electromyography (EMG) and nerve conduction study (NCS) : evidence of a motor neuronopathy with intact sensory nerve conduction.
- **MRI: most helpful test.** spinal cord lesions confined to the gray matter and spanning ≥ 1 spinal segment.
- Management: Steroids, IVIG, Plasma exchange.



TAKE HOME MESSAGE

- A detailed history and a thorough physical exam are essential to reach an accurate diagnosis.
- Knowing the right diagnosis can significantly impact the patient's life.

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Thank You !