Notable Neurologic Findings from Head to Tail

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What’s That Finding?

Disclosure

• Speaker for Codman Nursing Matters
What’s Wrong With That Baby’s Head?

Assessment

• Look at head from front, back sides, top and behind
• Check for asymmetry
• Head tilt?
• Torticollis?
• Boney ridges?
• Anterior fontanel?

Nonsyndromic Craniosynostosis

• 1 out of 2100 children
• Multiple suture synostosis in 4-8%
• Usually random
• Diagnosis made by physical exam
• Head CT confirms diagnosis
**Sagittal Suture Synostosis**
- Scaphocephaly
- Elongated head
- Frontal bossing
- Bitemporal narrowing
- Occipital cupping
- Palpable bony ridge along the sagittal suture
- Occurs 40-60% overall
- 2-6% are familial

**Coronal Suture Synostosis**
- Anterior plagiocephaly
- Eye on affected side pulled upward
- Harlequin sign on AP skull film
- Flattened forehead on affected side
- Nasal root is deviated to affected side
- 20-30% overall
- 8-14% are familial
Metopic Suture Synostosis

- Trigonocephaly
- Hypotelorism
- Palpable bony ridge along metopic suture
- Bitemporal narrowing
- 10% of all craniosynostosis

Positional Plagiocephaly
Positional Plagiocephaly

- Deformational forces can shape the skull
- 2 mo of age – 700 hours sleeping
- Rotate head to redistribute forces of gravity
- Torticollis further aggravates flattening
- Significant ↑ in positional plagiocephaly since 1992 “Back to Sleep” campaign
Positional vs Lambdoid

CT – 3D Recon

Towne’s View

Open lambdoid sutures
Treatment for Positional Plagiocephaly

- Place toys or other objects of interest on non-preferential side
- Alternate arms when feeding
- Tummy time when awake

Orthotic Correction

Head Circumference

- 35 cm – at birth
- ↑ 9 cm – by 6 mo
- ↑ 12 cm – by 1 yr
- 1 - 2 yr – 2 1/4 cm
- 2 – 3 yr – ¼ cm
- By 2 mo – 700 hours sleeping
Static Stretching Exercises

• To correct torticollis
• Confirm no C-spine defect
• Slowly turn head 90° toward non-preferential side
• Hold for 10 sec

Static Stretching Exercises

• Correct head tilt
• Do 5-6 times per day
• May need someone to hold shoulders

Refer to Neurosurgery

• The earlier the better for best outcomes
• Surgical correction for craniosynostosis
• Before 4 months of age for minimally invasive endoscopic strip craniectomy
• Correction of plagiocephaly should start early if not prevented by rotating head on mattress
The Soft Spot is Closed!

3 Things to Check

• Does the head look misshapen?
• Where does it fall on the head circumference chart?
• How is the baby doing developmentally?

Is the head misshapen?

• If you suspect craniosynostosis, refer to neurosurgery
Where does H.C. fall on the chart?

- Jumping isocurves?
- Is the brain growing?

Developmentally on target?

- If brain is not growing then skull will not enlarge and H.C. will be affected.
- MRI looks at brain
- CT look at bone
- Rapid sequence MRI looks at ventricles

What?! More Vomiting? Another Headache?
12 y. o. boy

- 3-4 mo. Hx of morning H/As with vomiting
- Getting worse over time
- Pale, tired, comes home from school and sleeps (cardiology appointment)
- GI appointment
- Many visits to PCP and Urgent Care

CT Head

Brain MRI
Brain Tumors

- Rarely diagnosed before 2-3 months from onset of symptoms
- Mean time from symptom onset to diagnosis was 27 weeks in one study
- Parents feel guilty they didn’t persist or missed it entirely

Why is it missed?

- Not every headache is a brain tumor
- 1 tumor/5,000 headaches (Pediatr Int, 2013)
- H&P not thorough
- Neglect of H/A with hi risk features (long duration, other sx, changing characteristics)
- Disregard parent reports of child’s sx
- Children’s ability to compensate
- Inattention to longstanding relapsing and remitting sx
- Pursuit of more familiar dx: migraines, psychiatric disorders, gastroenteritis

Most Common Symptoms

1. Headache – 66.7%
2. Vomiting – 57.7%
3. Vision – 46.2%
4. Gait – 41.6%
5. Fatigue – 41%
Neuroimaging

- Head CT – quick, no need for sedation
- Brain MRI – sedation for younger children
- Risk of herniation: decreased respirations may increase their CO2

Neurological Warning Signs

- Awakens with H/A, vomits and then feels better
- Unsteadiness or balance issues
- Vision - blurry, field cuts, dysconjugate gaze

Baby Got Back!
Could there be a tethered cord?

• Up to 70% of patients with tethered spinal cord will have a cutaneous lesion
• Also other musculoskeletal, neurologic and urologic symptoms
• Thick filum terminale
• Structures that keep the elasticity of the filum terminale from protecting the spinal cord from overstretched

Pathophysiology

• Spinal cord ascends with age in utero (from L1) and throughout first 3 months of life (L1-2)
• Neurological deficits due to cord being tethered to spinal canal or dura
• Traction causes decreased function over time (causes ischemia in the cord)

Why is This a Bad Thing?

• Repetitive flexion-extension movements, sudden violent movements, direct trauma at point of fixation causes ischemia to spinal cord
• Worsens with growth spurt
• Stretching causes neuronal damage, impairment of oxidative metabolism and decreased blood flow
Stretching the cord over a period of time can cause permanent neurological dysfunction.

**Musculoskeletal**

- Buttock asymmetry
- Foot deformities (club feet, valgus, varus, cavovarus deformities)
- Leg length discrepancies
- Scoliosis

**Urologic**

- Urologic dysfunction (urgency, retention, enuresis)
- Frequent UTIs and incontinence
- Difficulty toilet training
- Neurogenic bladder leading to intermittent catheterizations
Neurologic

- Motor weakness present in approx. 75%
- Pain is present in approx. 40% of kids
- Abnormal reflexes
- Spasticity
- Recurring ulcers
- Decreased sensation to light touch, temp., pinprick, proprioception

Lens (2013) Nursing Care of the Pediatric Neurosurgery Patient

Neuroimaging

- MRI of spine (usually lumbosacral area)
- Swaddle neonates = no sedation
- If too old (or restless) to swaddle, then ultrasound of spine for babies less than 6 months of age to spare them anesthesia
Dermal Sinus Track

Lipomyelomeningocele
Pseudotail

- Cylindrical outgrowth from L/S area
- Contains fat, cartilage, embryonic kidney
- True human tail contains cord, artery, vein, vertebrae

References