



What should I do with this funny shaped head?

Ruth E. Bristol, MD
Pediatric Update
2026

Disclosures

- None



Head Shape Clinics

Craniosynostosis Clinic

- > Why Us?
- > Conditions We Treat
- > Programs & Services
- > Meet Your Team

Providers



Ruth E. Bristol, MD

SPECIALTY
Neurosurgery

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Areas of Expertise

Microtia Craniosynostosis
Craniofacial Trauma

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Kathleen (Katie) E. Klas, RN, FA, MS, CPNP-AC/PC

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Areas of Expertise

Congenital Neurosurgical conditions	Concussion	Plagiocephaly
Synostosis	Hydrocephalus	Macrocephaly
Spina Bifida/Tethered cords		

- Joint clinic 3rd Tuesday and Wednesday each month



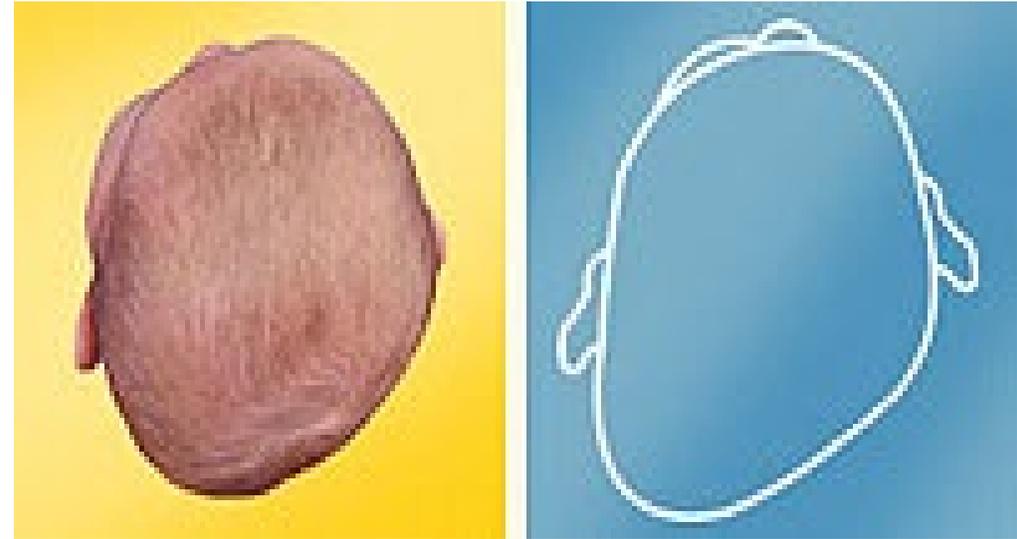
Nicole M. Kurnik, MD

SPECIALTY
Plastic Surgery



Question: This head shape is most likely:

- A. Normal, leave it alone
- B. Plagiocephaly: educate on repositioning
- C. Craniosynostosis: refer for surgery
- D. I'm not sure





This head shape is most likely:

Overview

- Plagiocephaly/Other head shape issues
- Metopic Ridge
- Early closure of fontanel
- Random lumps and bumps
- Craniosynostosis



Plagiocephaly and Head Shape Concerns



Risk Factor #1: Supine Sleeping Position



Dramatic Increase in Plagiocephaly (1/300 to 1/60)



Epidemiology

- Plagio seems to peak between 6 - 16 weeks, and drops off by 32 weeks
- Most new cases develop by 6 weeks, and almost never after 4 months
- Up to 30% of kids may have relative plagio or brachycephaly at some point during the first 8 months of life

Hutchison et al, 2004, Pediatrics

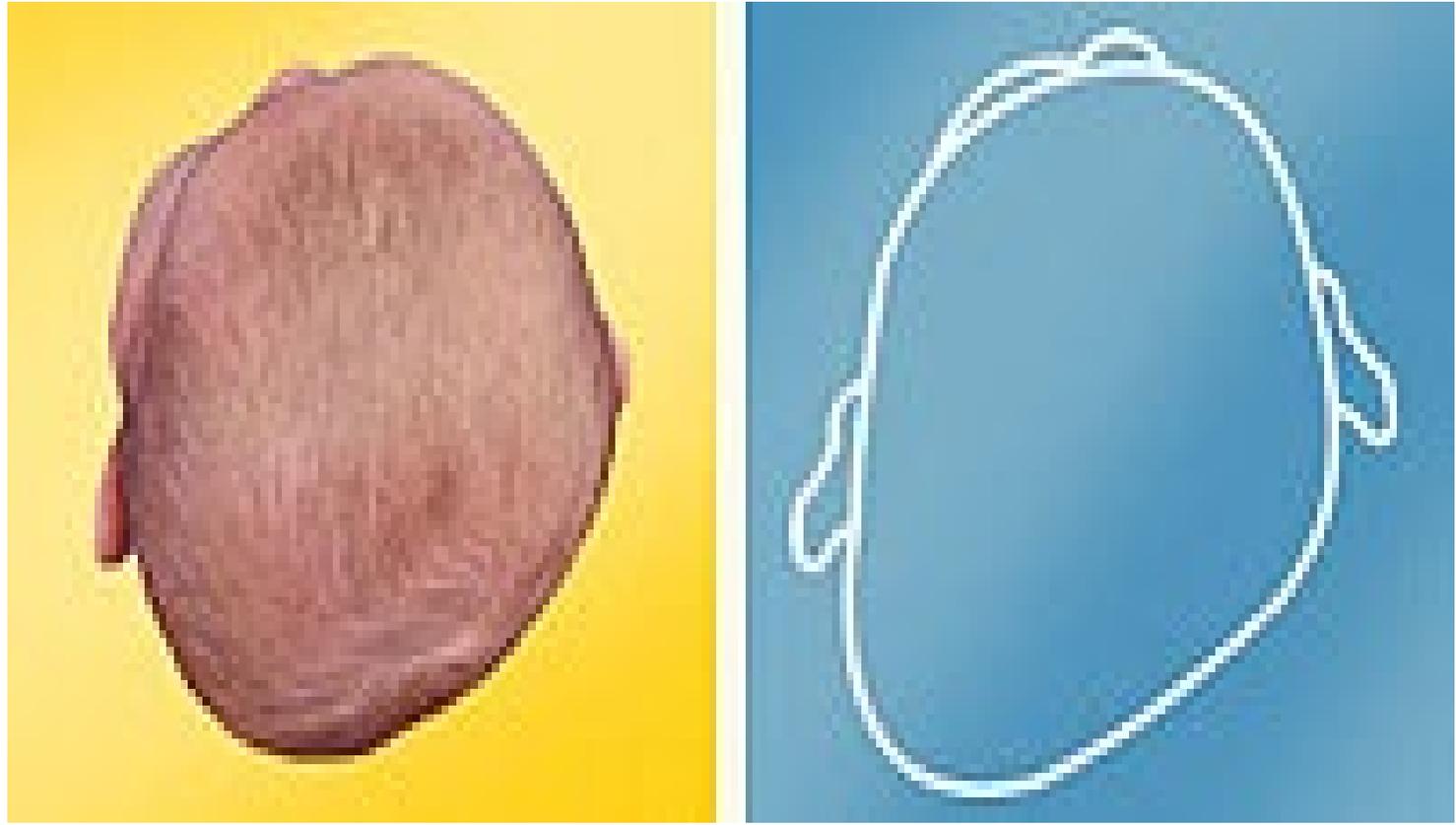


Diagnosis

- Clinical diagnosis in nearly all cases
 - classic parallelogram shape - best way is to look down upon top of head (finger in the ear test) subtle ear mal-alignment and frontal bossing are easily seen
 - check active ROM - usually find subtle restriction
- Rarely need Radiographic Imaging BUT
 - CT imaging - is the standard NOT skull series
 - IMAGE LIGHTLY
- Neck films in refractory torticollis

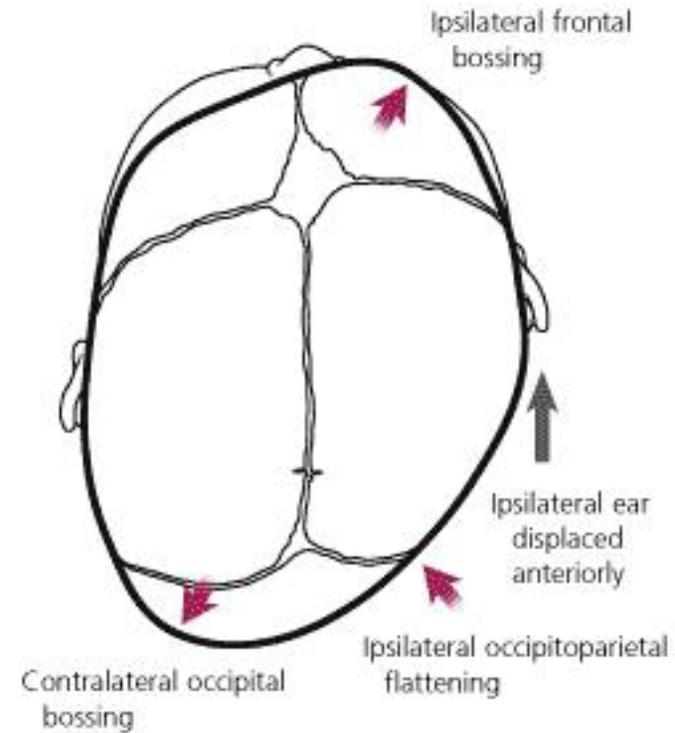


Parallelogram Shift



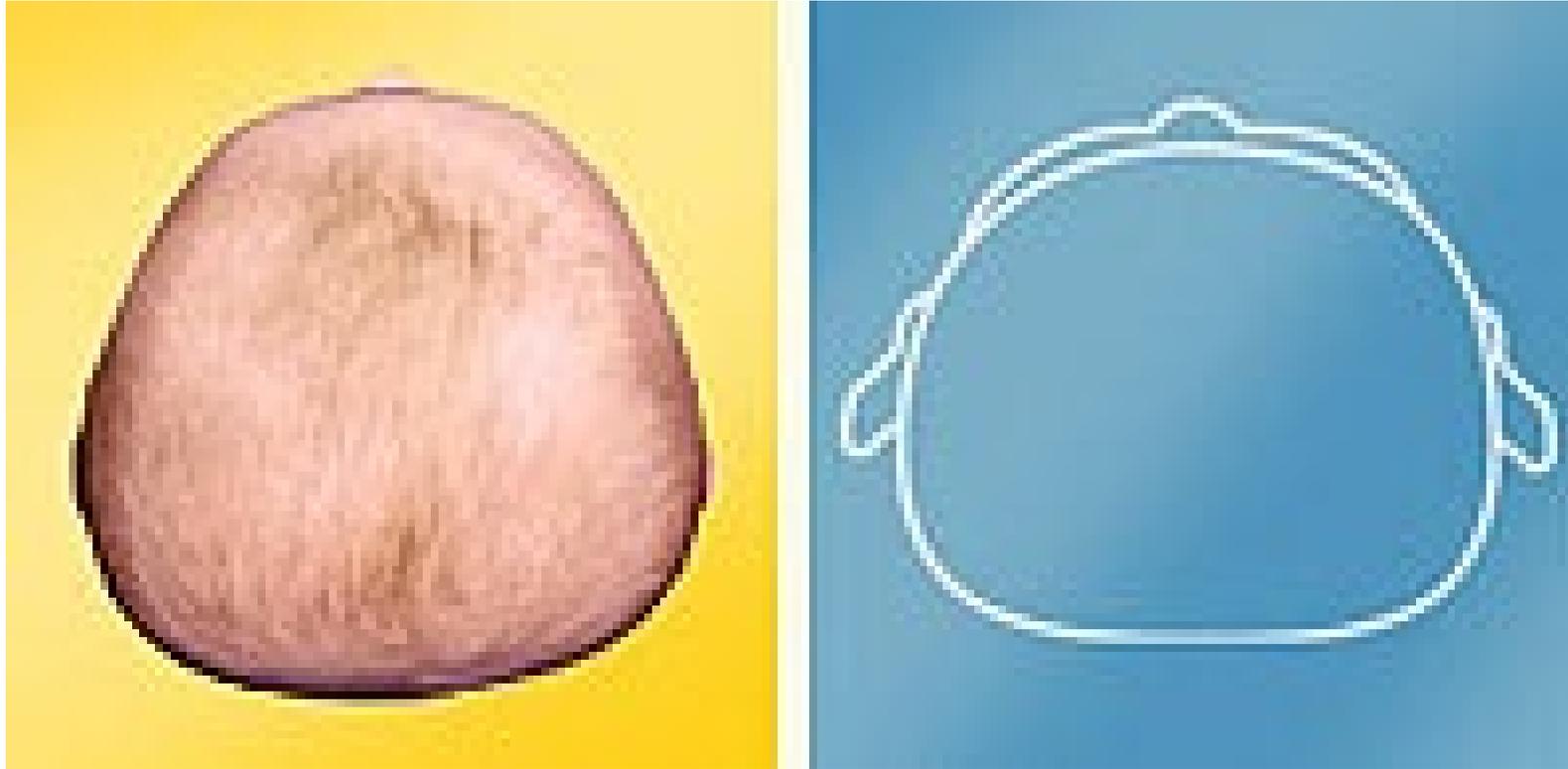
Ear “F” Rule

- Forward
- Flat
- Fine



Back only: Brachycephaly

- Flat in back with normal forehead and eye sockets



Back to sleep

- AAP Grand Rounds 2014. Ann Ritter
- Plagio increased from 2% to 20-40% since 1992
- **61% right side**
- **Male, first born, same position for feeds, lower educational status in mom**
- **Less than 2% of teenagers have residual measurable asymmetry**





Find it on Amazon...

Compare with similar items

				
	This item Turtle Lucky Elephant Adjustable Repositioning Beanie, Corrective for Flat Head Syndrome (Medium)	Boppy Noggin Nest Head Support, Gray Elephants, Head Support for Infants	BabyMoon Pod - For Head Support & Neck Support (Blue)	Inchant Adjustable Baby Soft Head Neck Support - Children Travel Car Seat Safety Pillow Cushion, Banana U-Shape Stroller Head Support for Toddlers Infants Child Best Gift - White
	Add to Cart	Add to Cart	Add to Cart	Add to Cart
Customer Rating	★★★★☆ (510)	★★★★☆ (3820)	★★★★☆ (1207)	★★★★☆ (316)
Price	\$34 ⁹⁸	\$14 ⁹⁹	\$23 ⁹⁵	\$10 ⁰⁹
Sold By	Turtle Products, LLC	Amazon.com	Maison Drake MD	Yixin E-commerce Co.,Ltd
Item Dimensions	5.98 x 5.98 x 2.09 inches	17 x 11 x 2.25 inches	10 x 10 x 3 inches	8.66 x 10.24 x 2.5 inches



AAP says No.

AAP Safe Sleep Environment Recommendations

Back to Sleep for every sleep.

- Infants should be placed for sleep in a supine position (wholly on the back) for every sleep by every caregiver until the child reaches 1 year of age.
- Side sleeping is not safe and is not advised.
- Skin-to-Skin is care is recommended for all mothers and newborns, regardless of feeding or delivery method, immediately following birth (as soon as the mother is medically stable and awake) for at least an hour. Thereafter, or when the mother needs to sleep or take care of other needs, infants should be placed supine in a bassinet.

For more information on skin to skin review the [American Academy of Pediatrics \(AAP\) Clinical Report, Safe Sleep and Skin to Skin in the Neonatal Period for Healthy Term Newborns.](#)

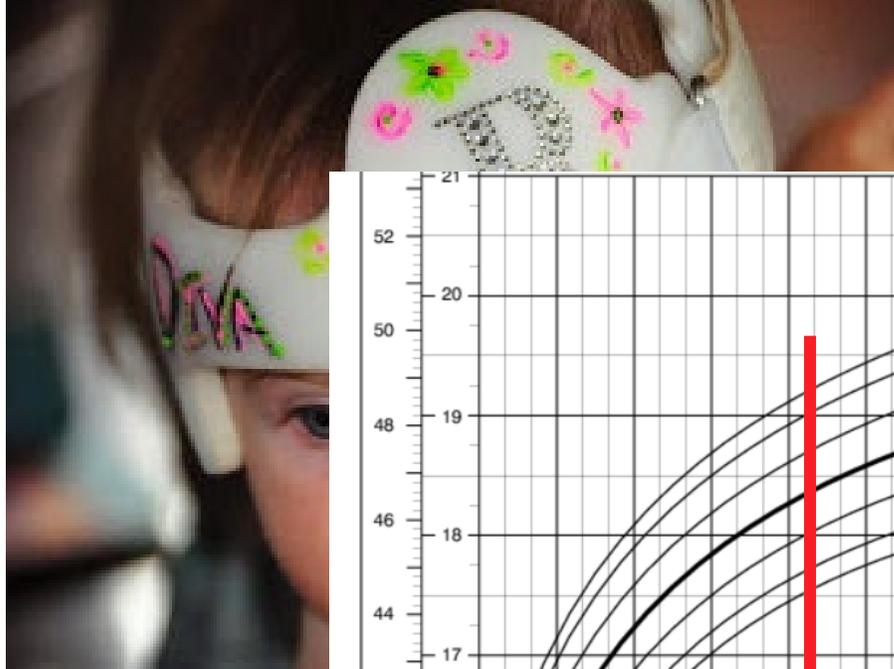
Use a firm sleep surface.

Avoid the use of commercial devices that are inconsistent with safe sleep recommendations.

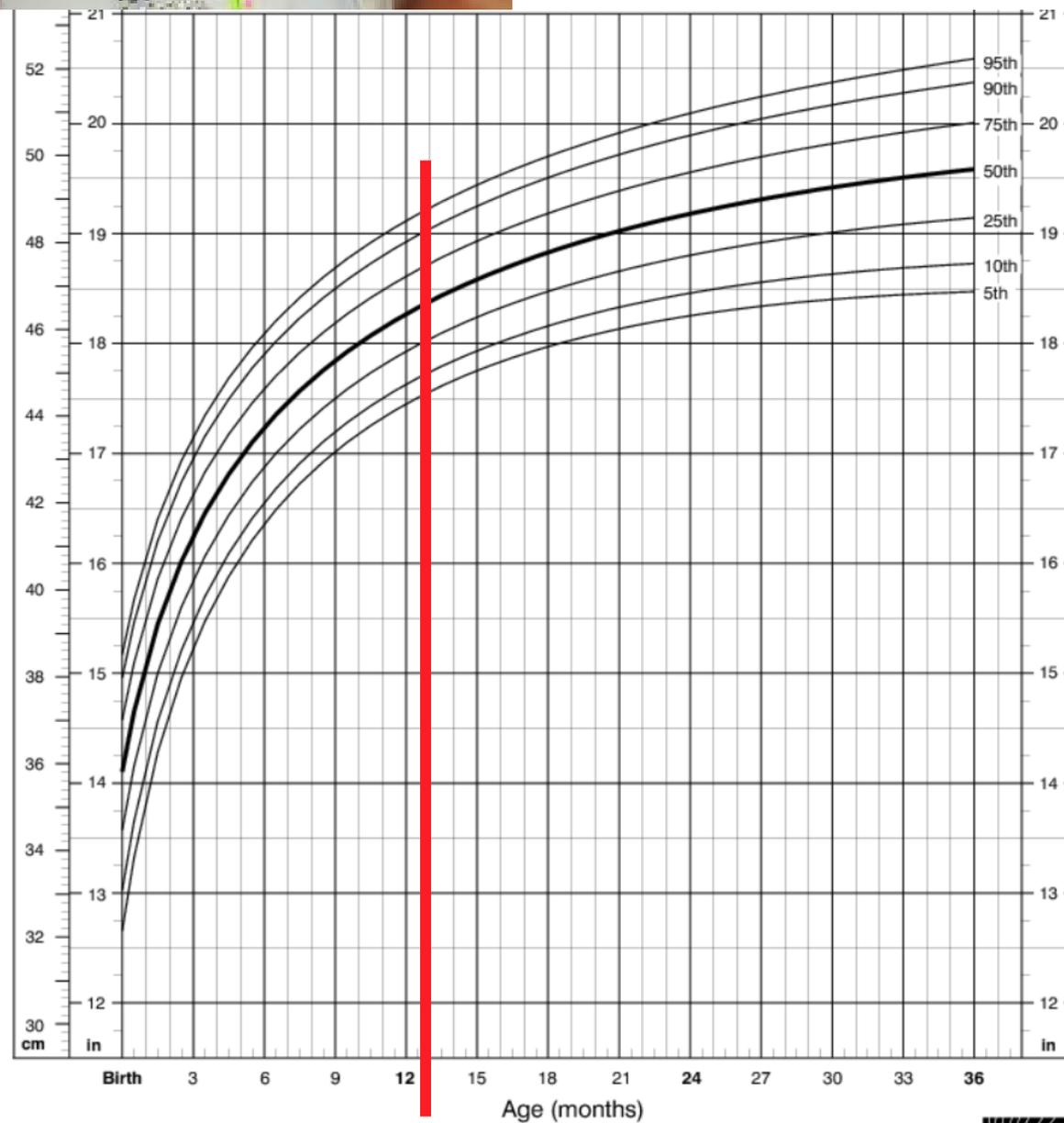
- Infants should be fitted sheet with
- Infants should not
- Soft bedding ren
- The Consumer Product Safety Commission (CPSC) offers safety standards for [bedside sleepers](#). There are no safety standards for in-bed sleepers. In addition, there are no published data examining the association of the use of bedside or in-bed sleepers with SIDS or unintentional injury of death, including suffocation. Therefore, a recommendation for or against the sleepers cannot be provided.



Custom helmets



- Helm
- NSC
- Wol
- Do



Guidelines for the Management of Patients With Positional Plagiocephaly

5. The Role of Cranial Molding Orthosis (Helmet) Therapy

[DOWNLOAD PDF](#)

[NEUROSURGERY, 2016](#)

Sponsored by

Congress of Neurological Surgeons (CNS) and the AANS/CNS Joint Section on Pediatric Neurosurgery

Conclusion: There is a fairly substantive body of non-randomized evidence that demonstrates more significant and faster improvement of cranial shape in infants with positional plagiocephaly treated with a helmet as compared to conservative therapy, especially if the deformity is severe, and provided that helmet therapy is applied during the appropriate period of infancy. Specific criteria regarding the measurement and

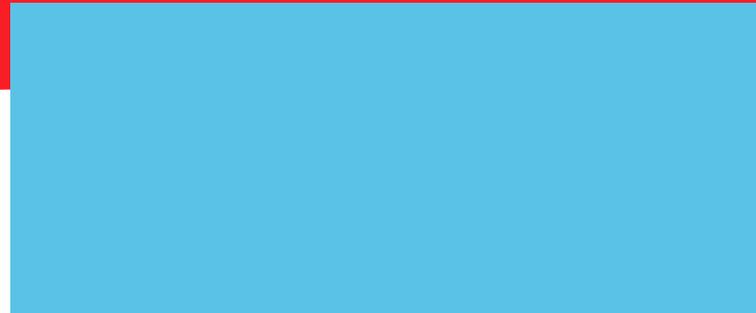


**No substitute for
engaged parenting!**



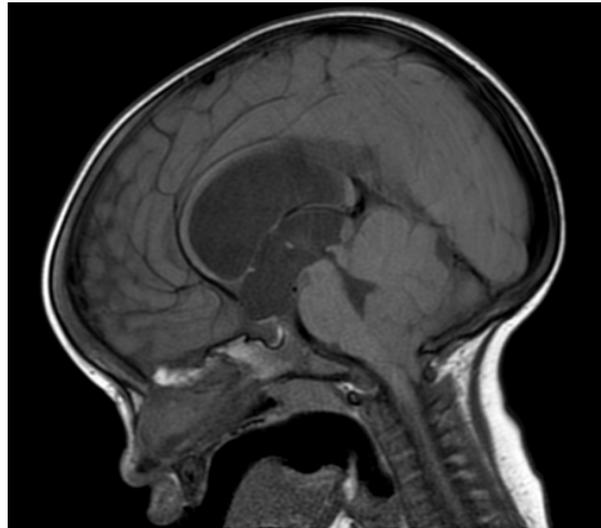


Micro and Macrocephaly



Macrocephaly

- Occurs when the head is abnormally large - **2 standard deviations above normal** for weight and gender.



- Myriad Causes
 - Familial
 - Extra-axial fluid collections
 - Sotos
 - Chromosomal
 - Hydrocephalus



Macrocephaly



Macrocephaly: Now what?

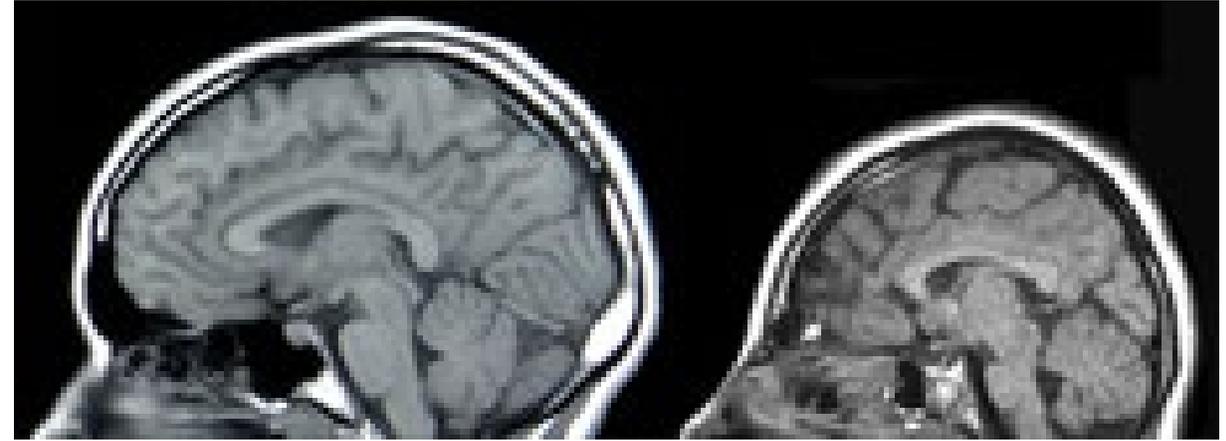
- Measure Mom and Dad's heads, if possible
- Compare to height and weight
- Look at development
- Any concern for abusive trauma?
- Follow over time
- If needed: Fast MRI/NSGY referral

- Most common: Enlarged subarachnoid spaces (no treatment)
 - Presents between 6-9 mos, resolves around 1.5 to 2 years



Microcephaly

- is a neurodevelopmental disorder. It is an important neurologic sign, but no uniformity exists in its definition. It is usually defined as a head circumference (HC) **more than two standard deviations** below the mean for age and gender.



- Congenital
 - Syndromes
 - Chromosomal
- Post natal
 - HIE
 - Trauma
 - Stroke



Microcephaly

Normal head size



Microcephaly



- NOT craniosynostosis: headshape is usually normal.
- CS never results in OFC < 2 standard dev below



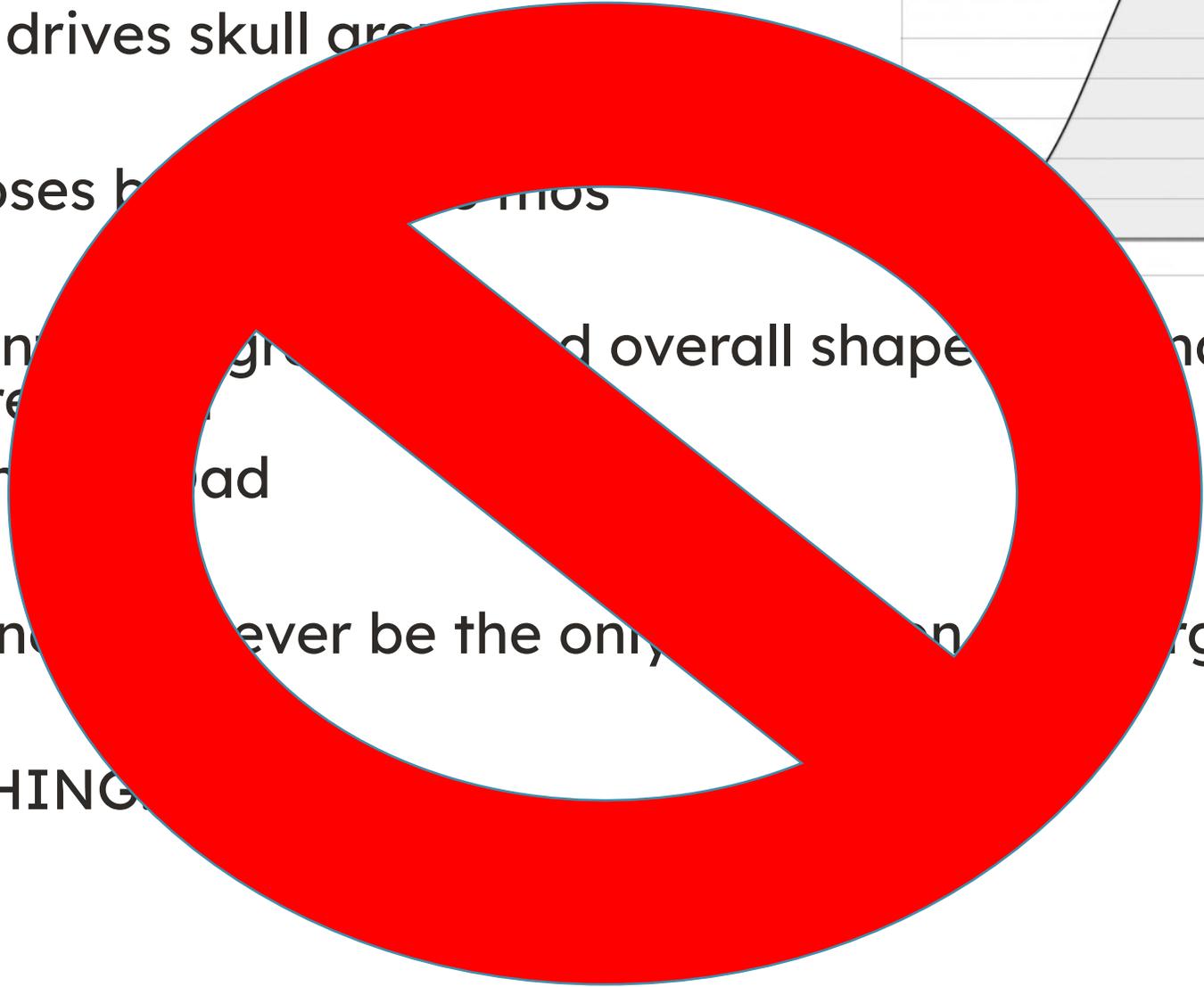
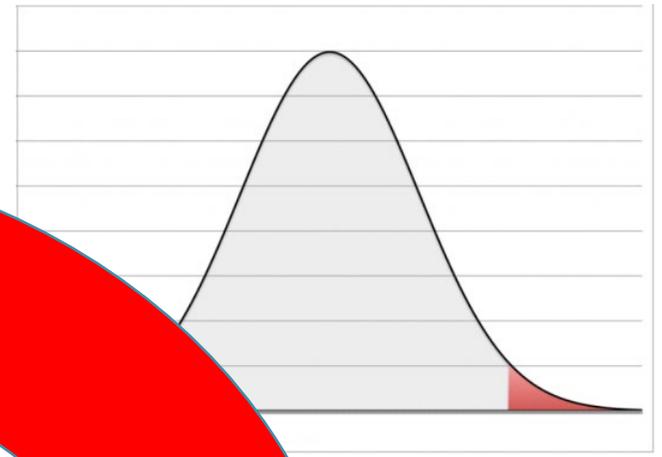
Microcephaly: What next?

- Measure Mom and Dad's heads, if possible
 - Compare to height and weight
 - Look at development
 - Follow over time
- If OFC is out of proportion to height and weight, and development is delayed, referral to Neurology is warranted.



Early Closure of the Fontanel

- Brain growth drives skull area
- Genetics
- AF usually closes by 18 months
- If developmentally appropriate and overall shape normal, no intervention required
- Measure Mom's head
- A small fontanel can never be the only sign of a surgical problem.
- IT'S NOT A THING



THE METOPIC RIDGE

Normal



Not Normal



Metopic suture

- The only suture that normally closes during infancy
- Between 3-9 mos

Vu, Panchal, Parker et al. 2001

- Take home message: incidental finding on trauma CT of “closed metopic suture” is only of concern if there are other features of trigonocephaly



Take home points for metopic ridge:

- Is there a nice rounded forehead?
- Are the eyebrow bones (orbital rims) nicely developed?
- Is the head normal sized?
- Is the child over 6 mos of age?

- What to expect:
- Ridge will be visible and may worsen until 18 months, then invariably resolves around age 3 years.



Mom brings a 4-week-old baby for concerns about suture ridging. It developed about 1 week after birth and hasn't changed. This is:

- A. Early sagittal craniosynostosis requiring referral
- B. Pathologic suture ridging due to metabolic bone disease
- C. Benign overriding sutures of infancy
- D. Premature coronal suture fusion with impending craniofacial asymmetry
- E. Positional plagiocephaly with compensatory suture prominence

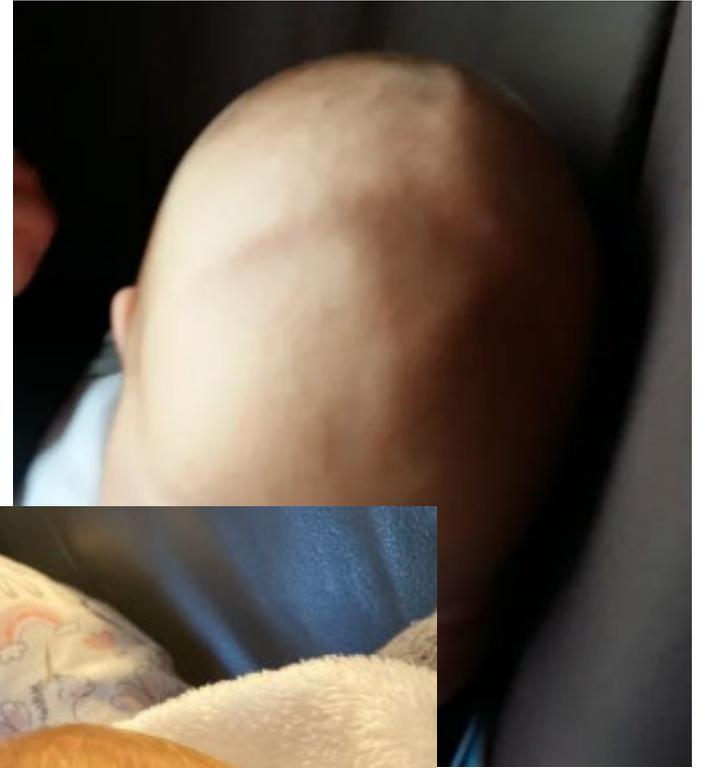




4 w/o with suture ridging. It developed about 1 week after birth and hasn't changed.

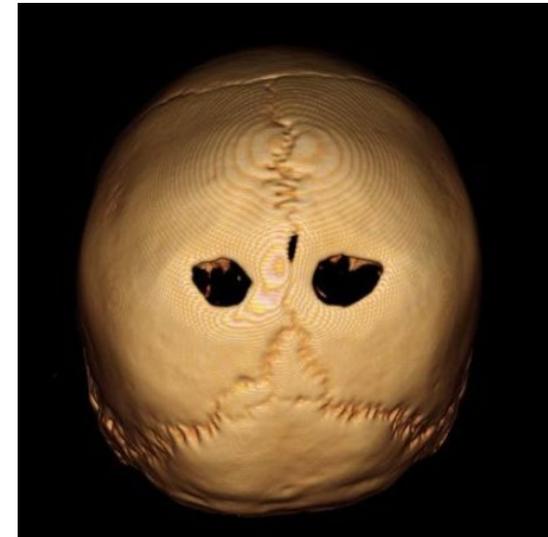
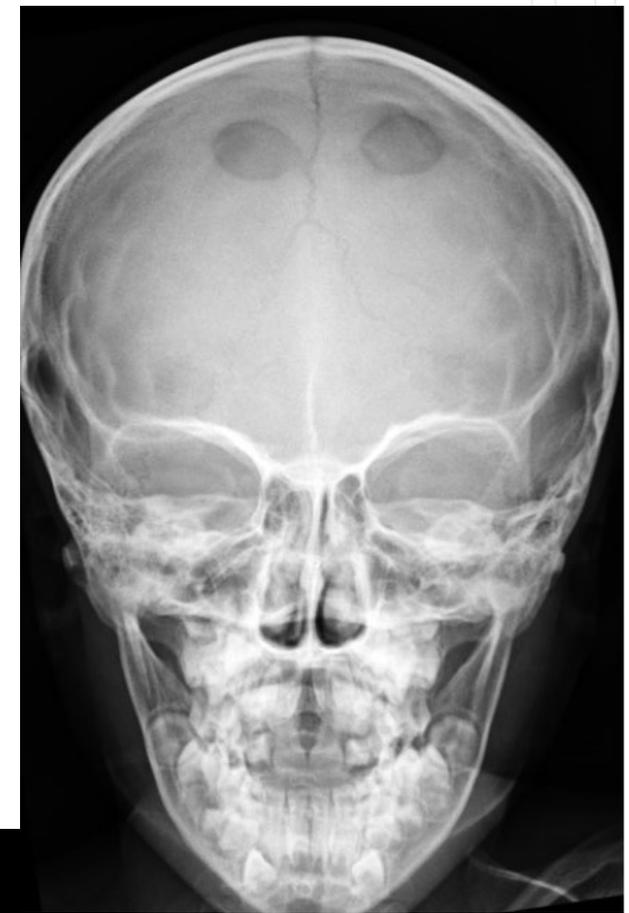
Overriding Suture “Ridges”

- Very young babies < 3 mos
- Normal after weight loss
- May be asymmetric if there is a head turning preference
- Does not require intervention or referral



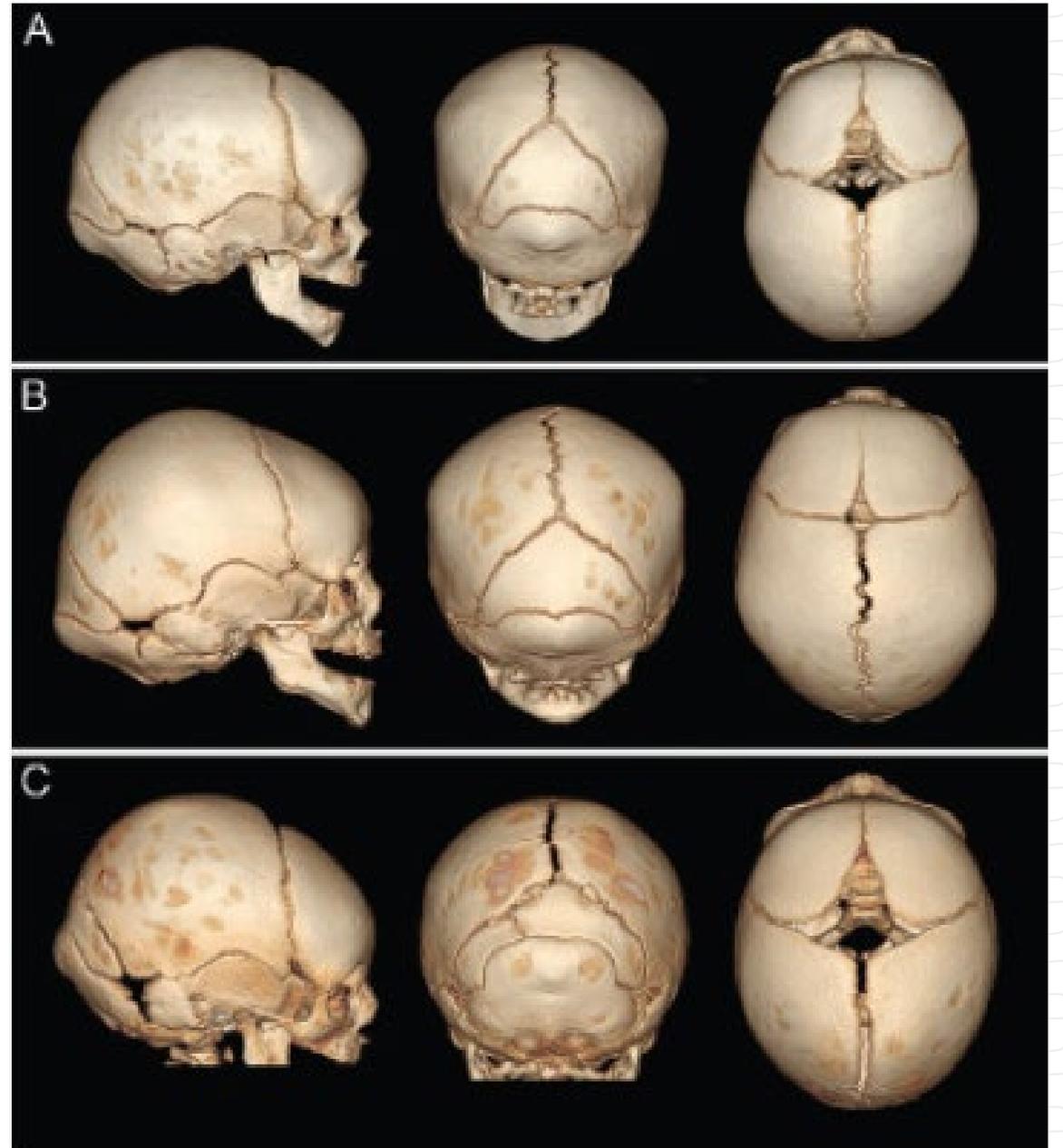
Skull Holes

- Persistent Parietal Foramina
- Foramina Parietalia Permagna
- Deficient ossification around the parietal notch, which is normally obliterated by the fifth month of fetal development
- Inherited in an autosomal dominant manner with high, but not complete, penetrance



Bathrocephaly

- **Persistent Mendosal Suture**
- The endochondral and membranous portions of the occipital bone converge at the mendosal suture.
- Normally closes during fetal life or early infancy.
- When it persists, it is associated with a characteristic head shape that requires no intervention.



Smartphone Is Not the Only Reason for Horn Behind Your Head

in Blogs / by admin

People getting horn behind head is projecting the concern on evolution of human being.

What is the horn behind the head? How does it develop? Is smartphone the only reason behind? Whether it is good or bad?



- Occipital spur, knob, occipital hook
- frequently diagnosed in anthropologic Neanderthal
- It is a frequent finding and hence a pathologic finding is often used in forensic investigations



A 2-month-old presents with a long, narrow head. There is bitemporal pinching, a sagittal ridge and pointy occiput. You should:

- A. Recommend repositioning with increased tummy time
- B. Obtain 4 view skull radiographs
- C. Refer to neurosurgery
- D. Order a non-contrast head CT





2 m/o presents with a long, narrow head, bitemporal pinching, a sagittal ridge and pointy occiput. You should:

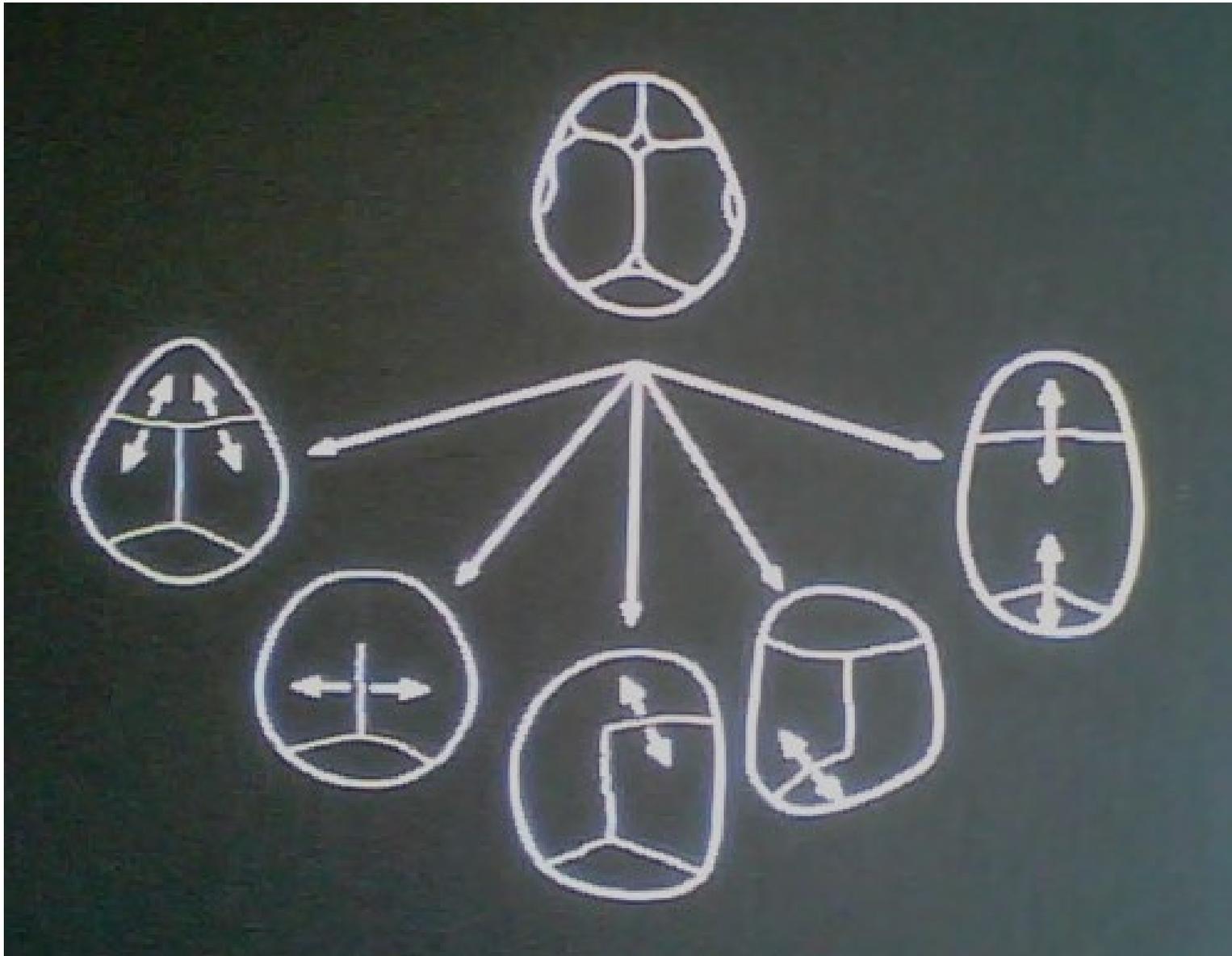


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Craniosynostosis

Premature Suture
Closure

Craniosynostosis



Synostosis: 1/2000 Births

- Sagittal - (60%)
- Coronal - Bilateral or Unilateral (25%)
- Metopic - (15%)
- Lambdoid - (2%)

- Vast majority is present at birth!



Treatment Options: Simple Synostoses

- Endoscopic or minimally invasive suturectomy
 - Surgery at 3-4 months
 - Helmeting 3-6 months
- Suturectomy + springs (certain sutures only)
 - 3-5 months (spring removal 3 months later)
- Open surgery for total or subtotal vault reconstruction
 - Surgery at 6-12+ months
 - No helmet
- No interventions before 3 months



Sagittal Synostosis

- Fusion of sagittal suture
- Long, narrow head
- Occipital and frontal bossing
- Palpable midline ridge
- Temporal pinching



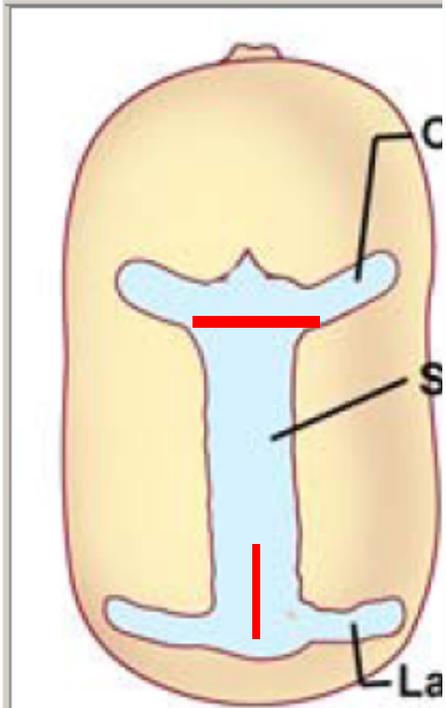
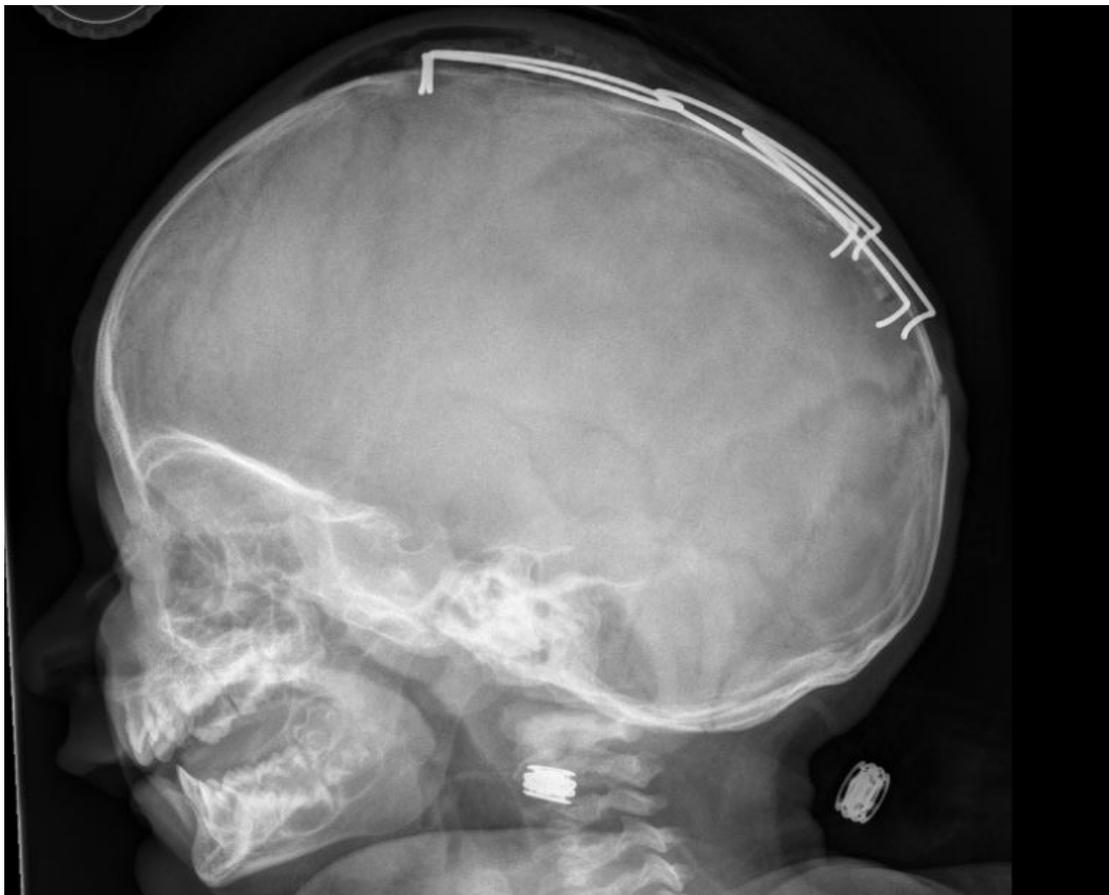


Figure 9 - Two variatic sagittal synostosis. Pa lambdoid sutures may Graves



Also minimally invasive:



Springs pre and post



Pre and Post Springs

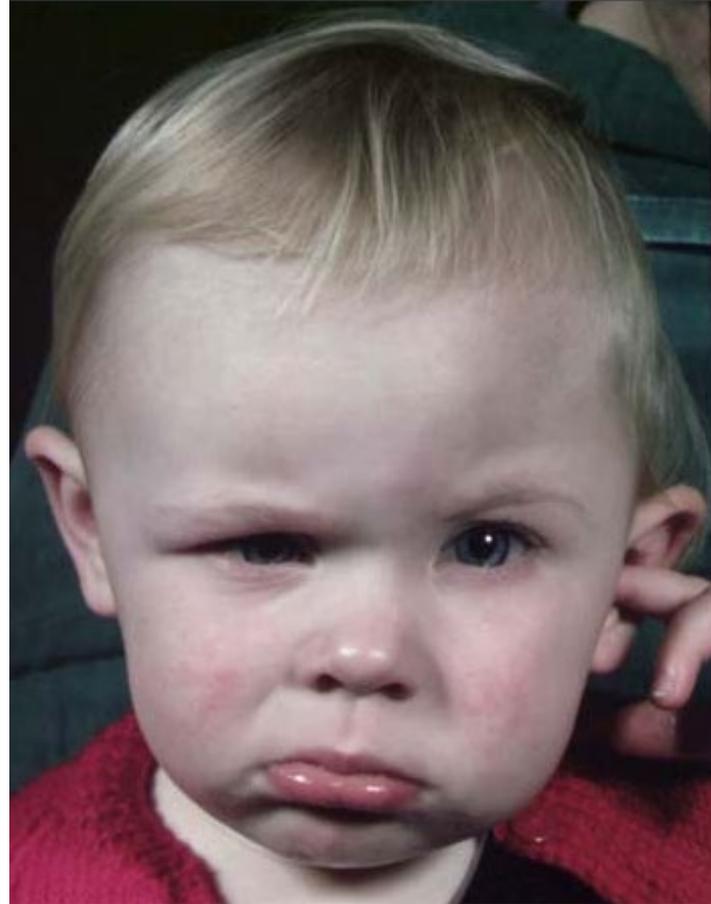
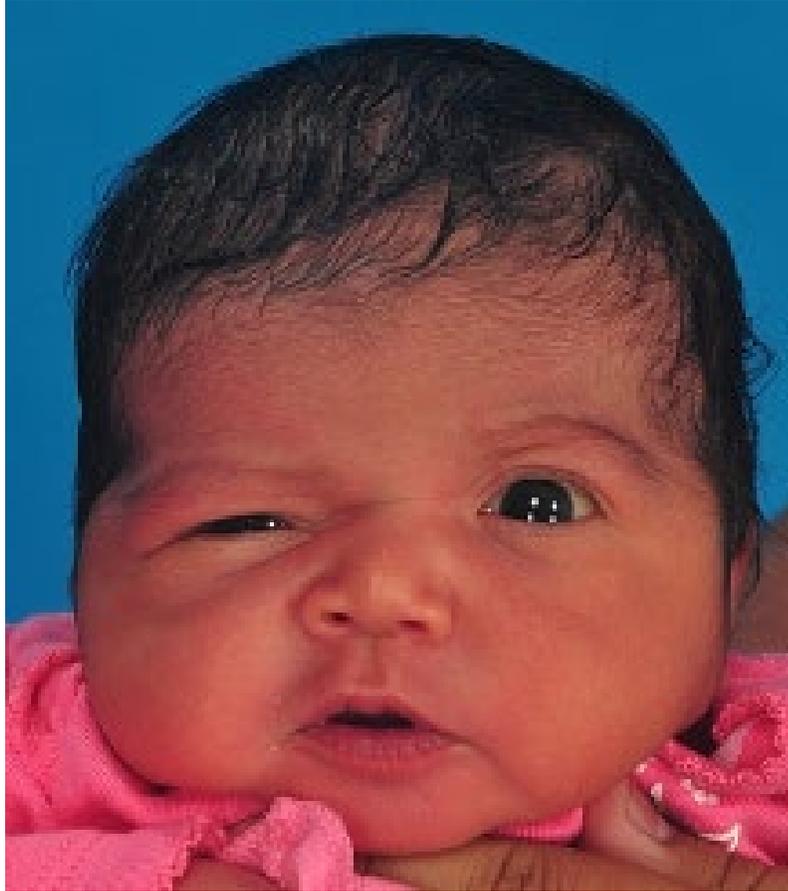


Coronal Synostosis

- Fusion of one (or both) coronal sutures
- ipsilateral forehead flattening
- contralateral forehead bossing
- nasal root deviated ipsilaterally
- orbital distortion
- palpable ridge
- ipsilateral ear anteriorly displaced



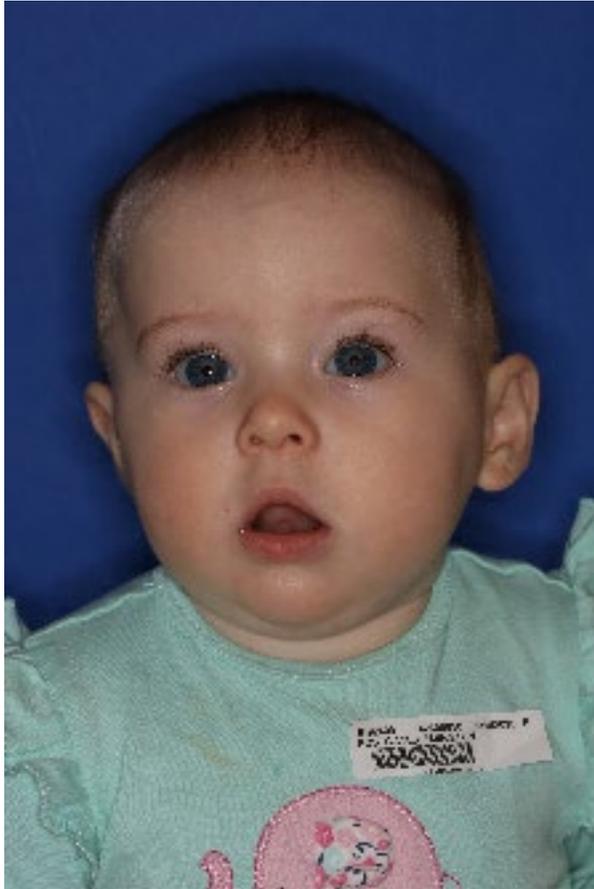
Unilateral Coronal



Unicoronal procedure

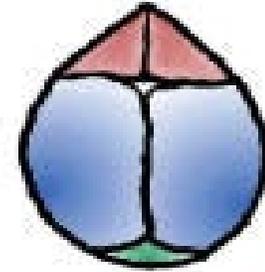


Post-op Unicoronal

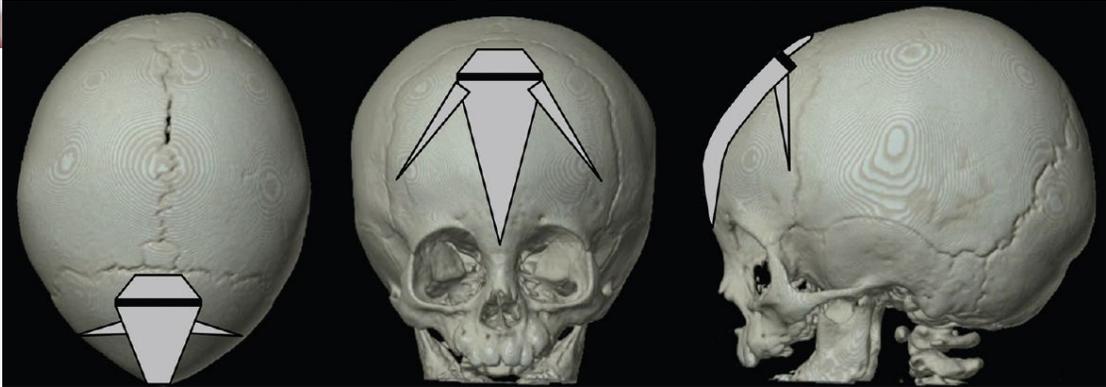


Metopic Synostosis

- Palpable/visible vertical ridge along forehead
- Trigonocephaly
- Lateral orbital/temporal narrowing
- Hypotelorism
- Relative biparietal bossing



Metopic Procedure

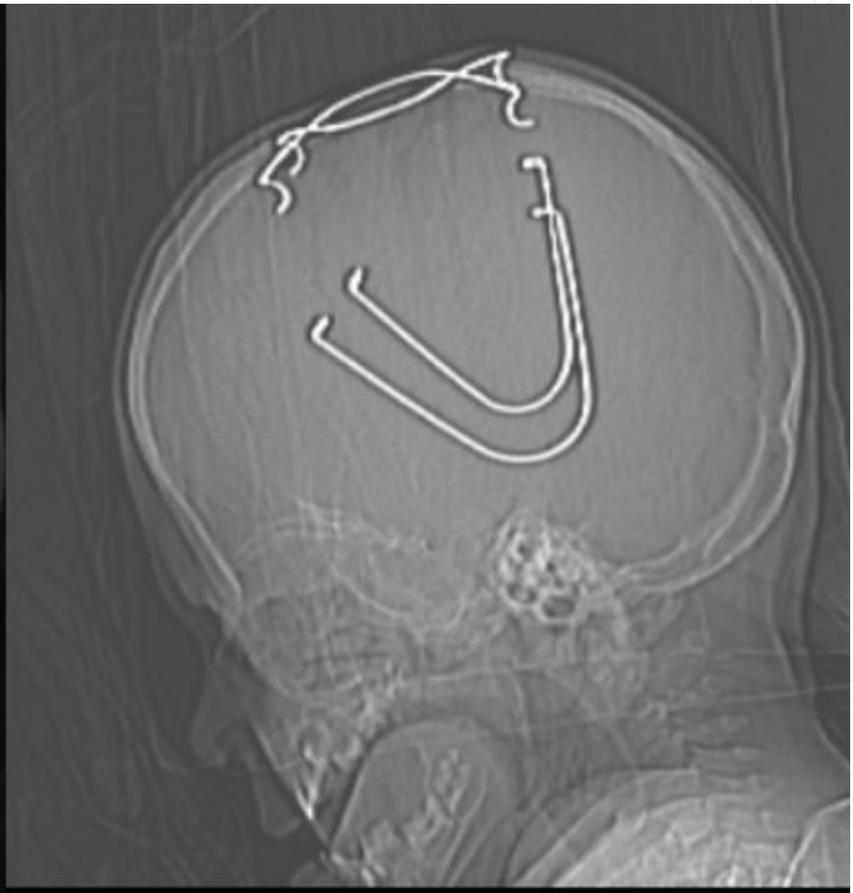


Treatment Options: Multi-suture/Syndromic Synostosis

- Suturectomy 3 mos of age
- Distraction Osteogenesis
 - Spring or Traditional
- Open Calvarial Vault remodeling/reconstruction



Can it be simpler?





Conclusions

- Early referral from pediatrician allows for minimally invasive approaches, if possible
 - Age 1-2 months is best
- The vast majority of head shapes that require surgery are present AT BIRTH.
- Please feel empowered to reassure and educate on repositioning.
- Very little imaging is needed for head shape anomalies





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Thank you!

