Plastic Surgery: From Head to Toes

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Disclosures

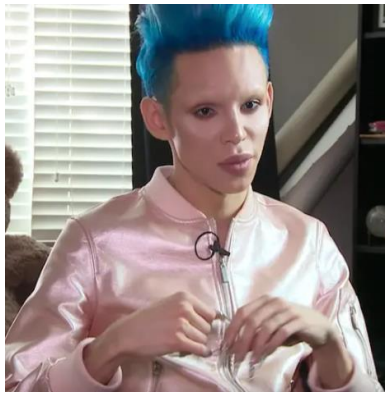
- I have no relevant financial or non-financial disclosures to make
- I will not be discussing off-label use of any commercial product

All photographs have been selected from journals, internet sites or appropriate consent was obtained from families.

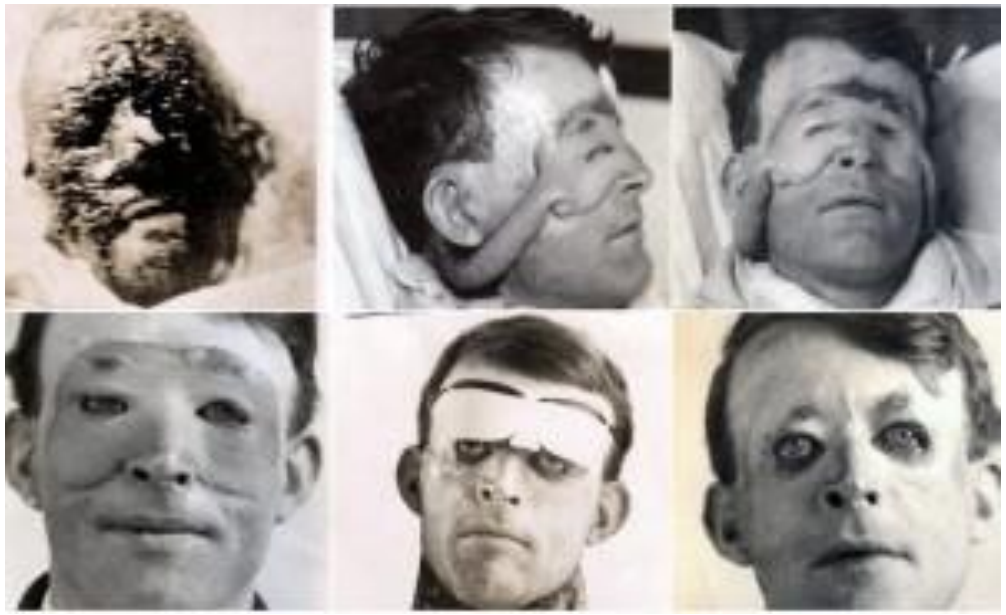
Objectives

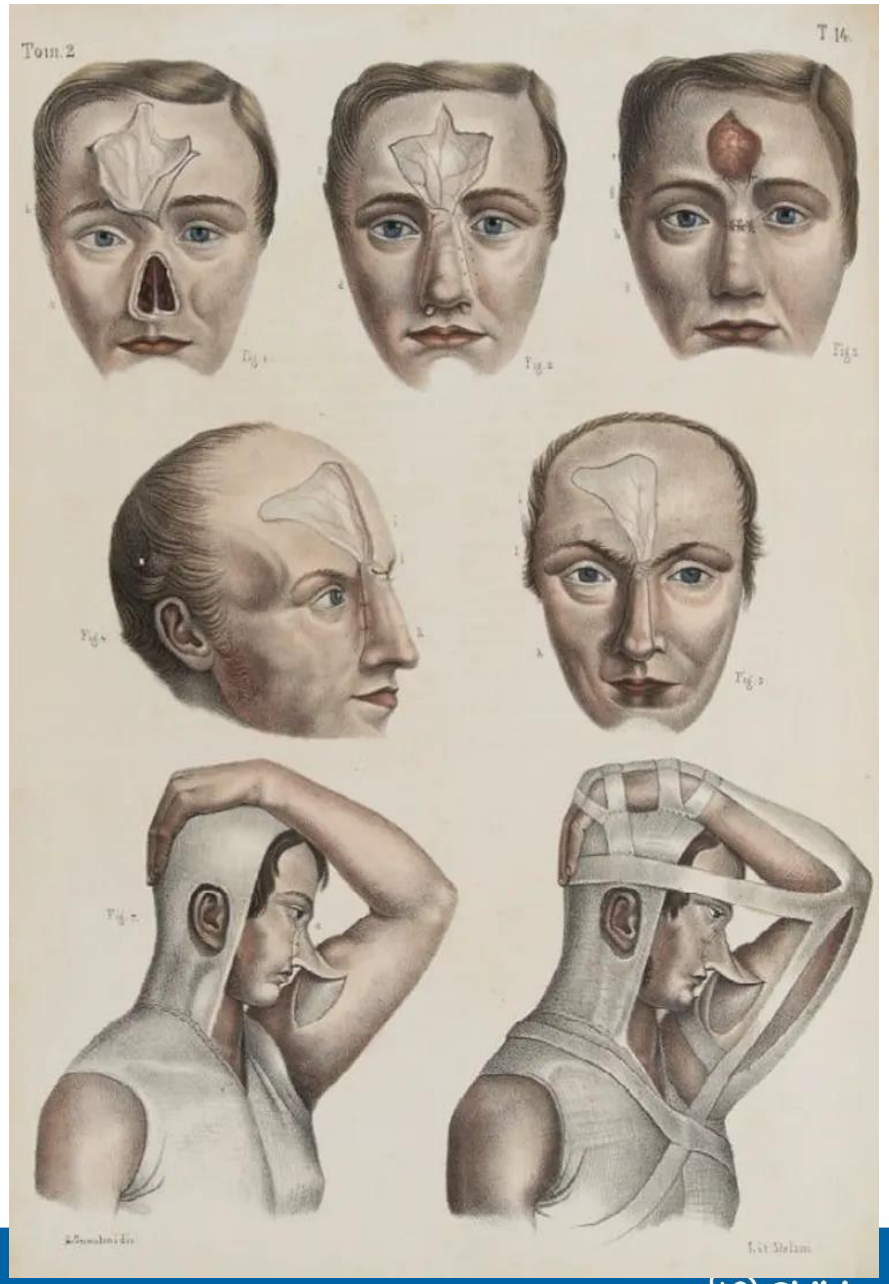
- Assess head shape differences in infants: craniosynostosis versus plagiocephaly
- Establish early treatment of positional plagiocephaly
- Understand various congenital craniofacial conditions
- Care of cleft lip/palate patients
- Determine what conditions to refer to a Plastic Surgery clinic
- Review common lesions seen in Plastic Surgery

Plastic Surgery – What we're not….



Plastikos – "to mold or give form"

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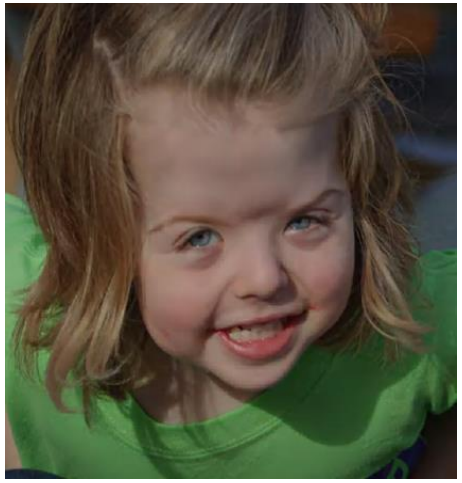
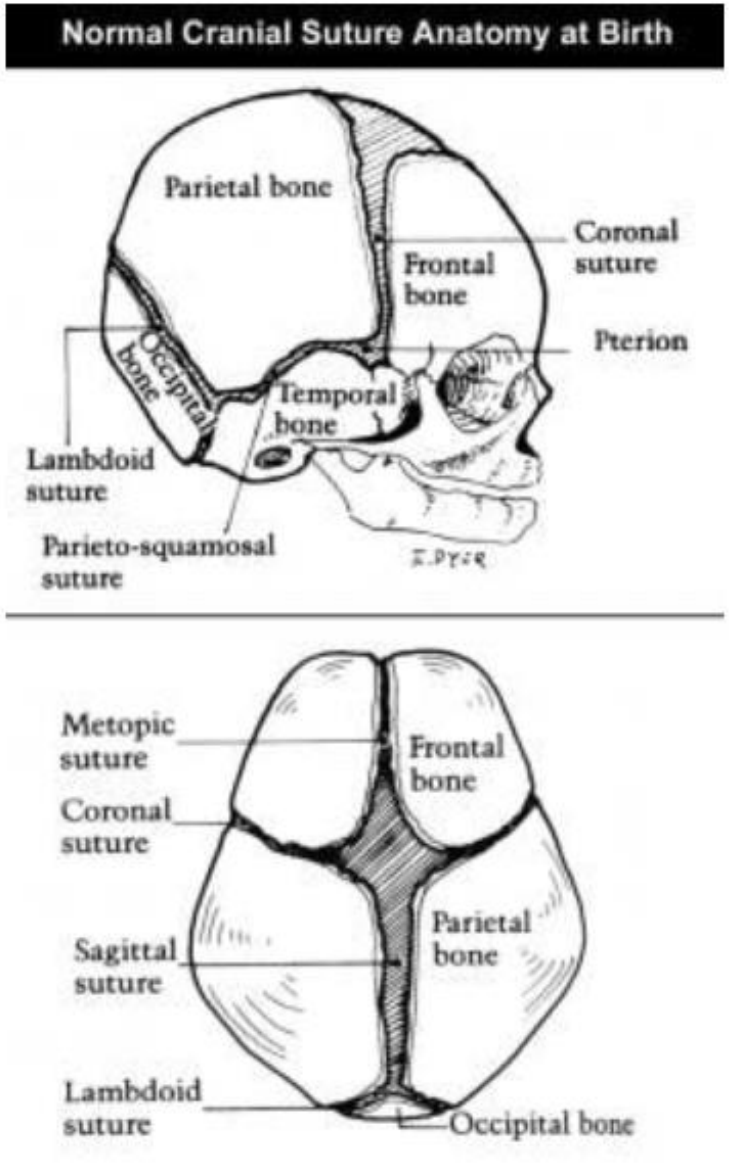
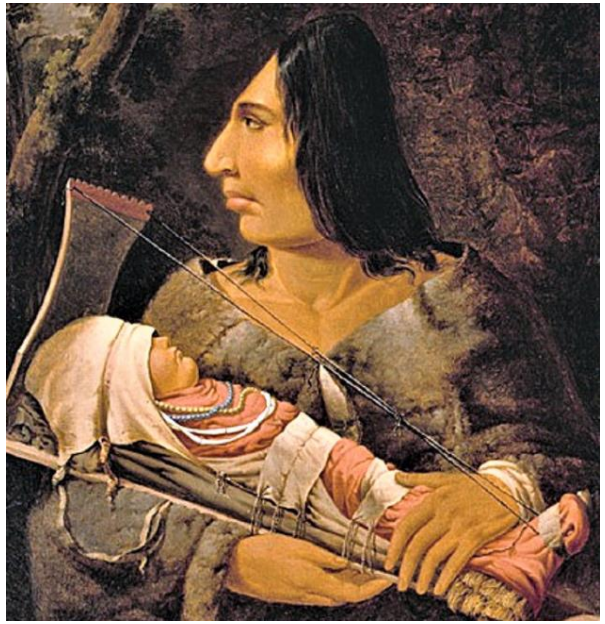
Who we are!

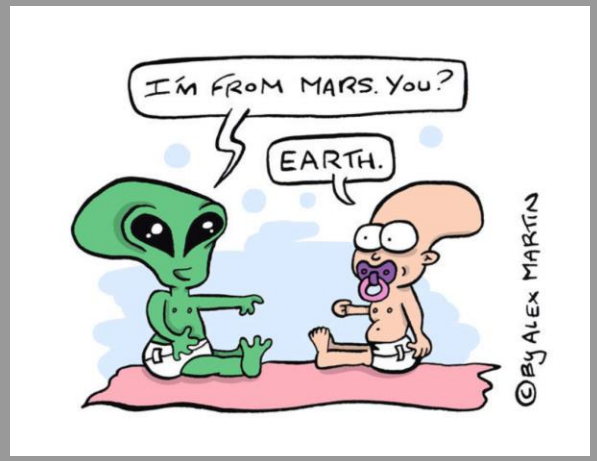


Cranial anatomy

- Infants have 8 cranial bones, separated by sutures
- Allows for movement of cranial bones during birth and rapid increase in brain size during first year of life
- Cranial growth until around age 7-8
- Metopic suture closes around 6 months of age
- Remaining sutures close in early adulthood







Baby Heads: When to worry!

- Various cultures view head shapes differently.
- Both positioning and genetics play a part in head shape.
- Back to sleep campaign started in the 90's – more infants have flatter heads.

Children's Mercy

Positional plagiocephaly: *Asymmetrical distortion of the skull*

- May be the result of a restrictive intrauterine environment
- Commonly seen in infants with torticollis
- Higher rates for twins/multiple births, premature infants, infants who were positioned in the breech position or back-to-back, as well as for infants born after a prolonged labor.

Plagiocephaly – parallelogram shape,

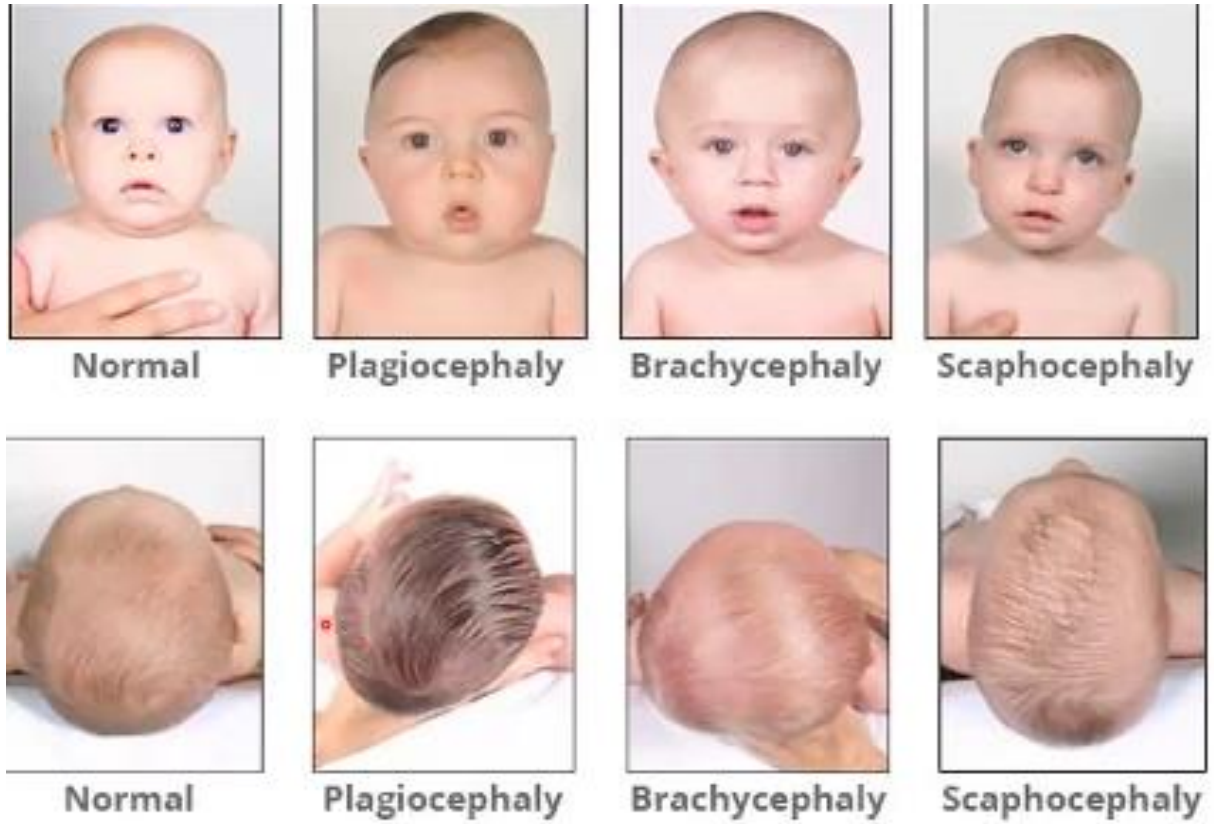
- Head is flat on one side; asymmetrical
- One ear is more forward than the other
- Often have torticollis

Brachycephaly – short and wide

- Back of head is flat
- Infant on back of head for longer periods
- Common in good sleepers!

Scaphocephaly – long and narrow

- Flattening on both sides
- More common in premature infants



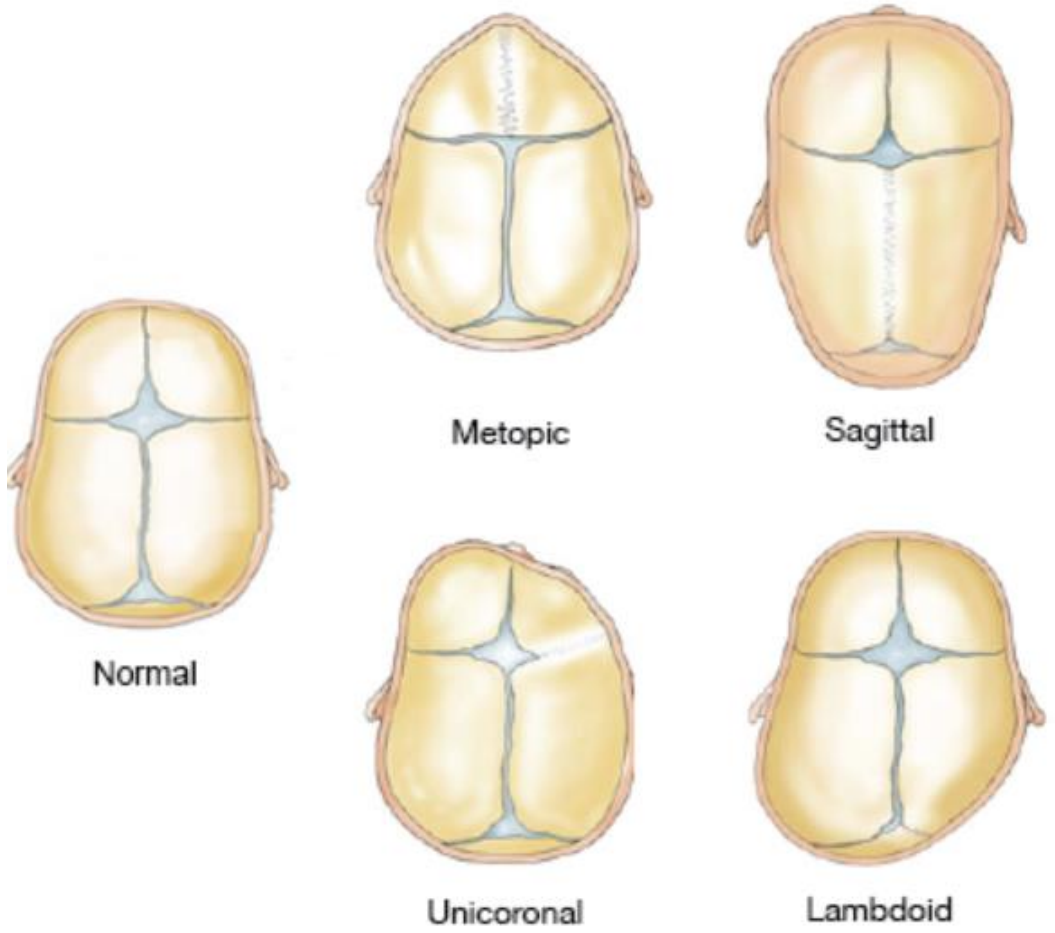
Plagiocephaly - treatment

- Early repositioning, tummy time, gentle neck stretches to improve torticollis
- May need Physical Therapy for torticollis
- Cranial remolding therapy (cranial molding helmets) can be helpful in severe cases
- Optimal age for starting helmet therapy is 5-6 months as infants should have decent head/neck control

Craniosynostosis

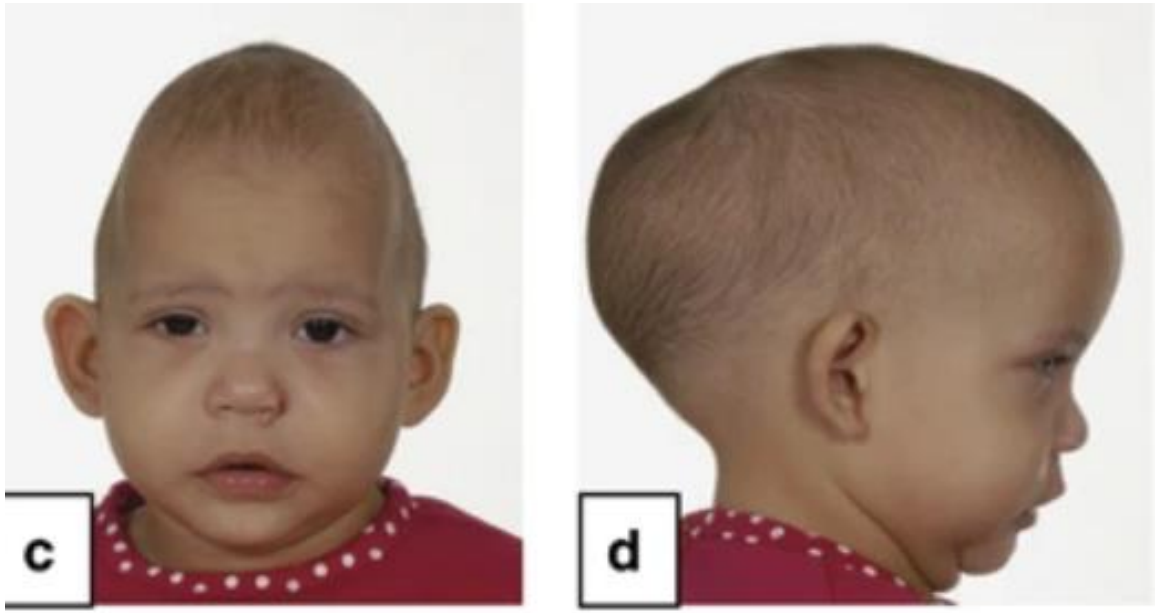
The early growing together (or fusion) of two or more bones of the skull

- Metopic (trigonocephaly)
- Sagittal (scaphocephaly)
- Coronal (anterior plagiocephaly)
- Lambdoid (posterior plagiocephaly)



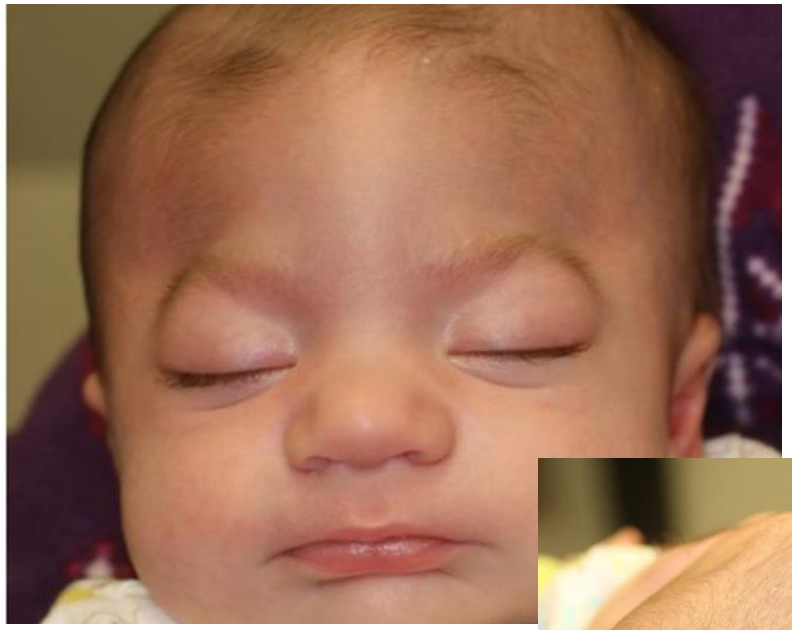
Sagittal Craniosynostosis

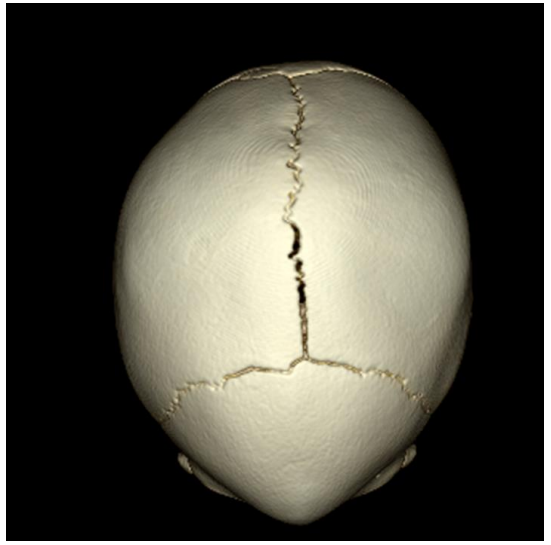
- Most common form of craniosynostosis affecting roughly 1 in 5,000 babies at birth
- Fusion of the sagittal suture running from front to back at the top of the skull
- Boys affected more than girls, roughly 4 to 1.

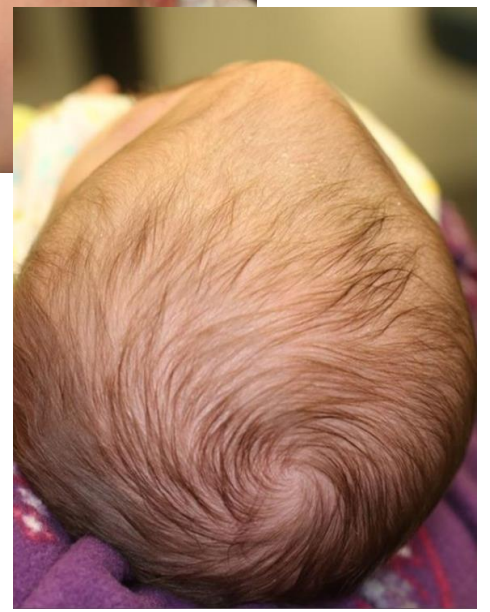


Metopic craniosynostosis

- Early fusion of metopic suture, noticed at birth
- Hypotelorism (decreased distance between eyes)
- Forms a prominent ridge in the forehead
- Metopic ridging can be normal and not require surgery

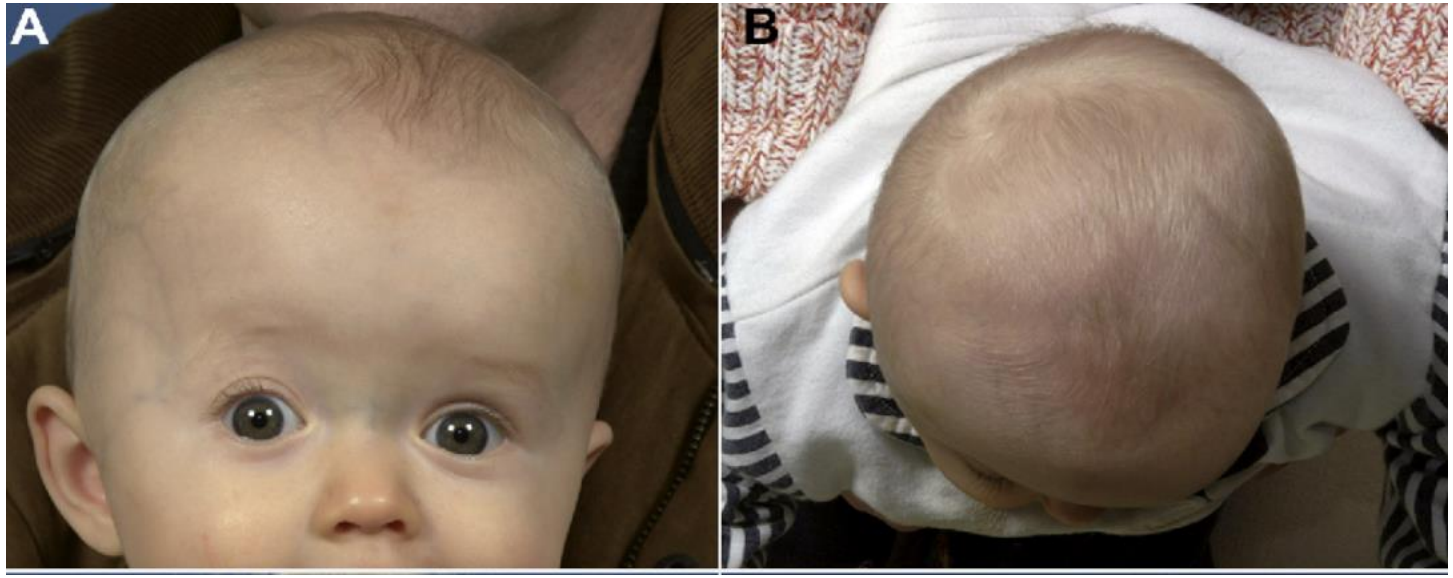


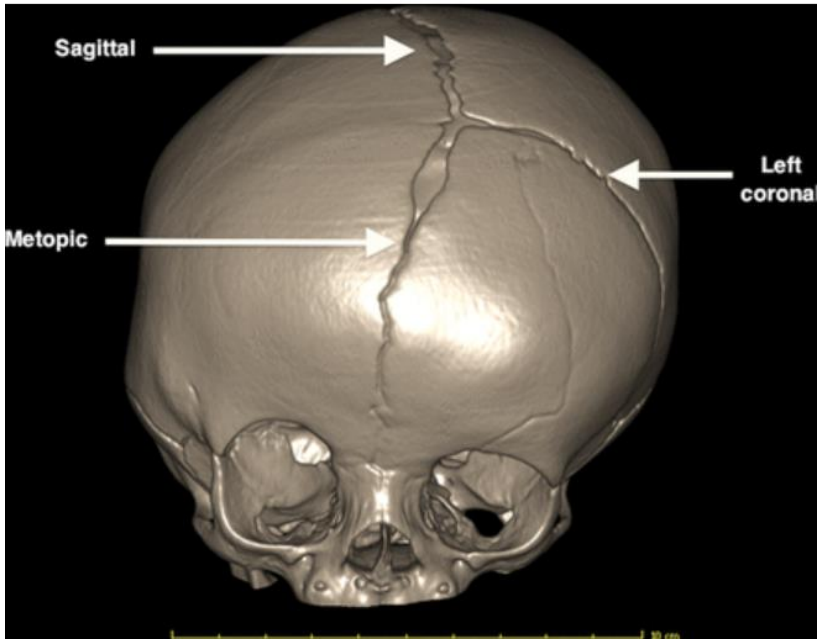




Unicoronal craniosynostosis:

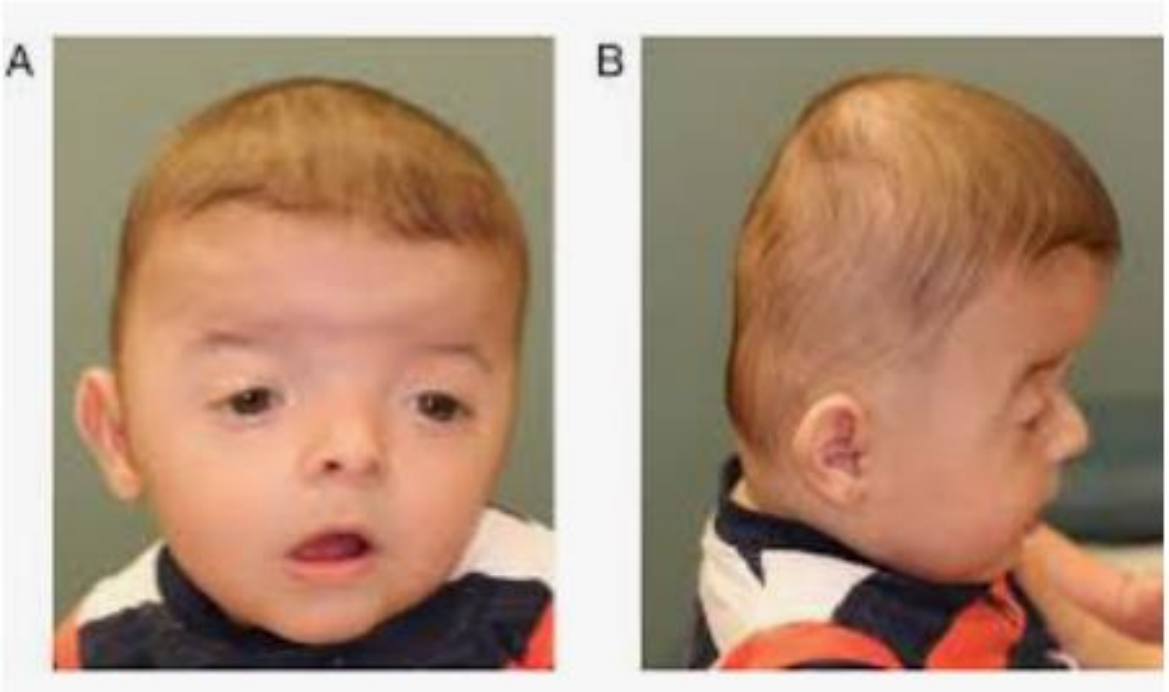
- Second most common type of craniosynostosis
- Fusion of the right or left coronal sutures
- Flattened forehead on the side of fused suture
- Orbital rim on affected side may be raised up (Harlequin deformity)
- Nose can be pulled toward affected side.

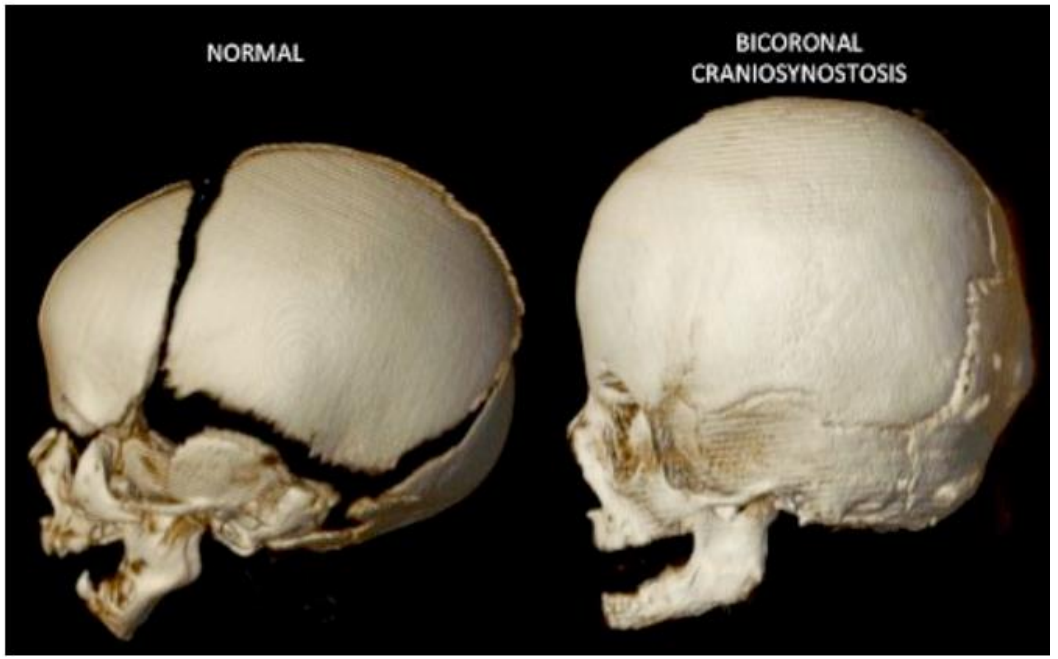




Bicoronal craniosynostosis

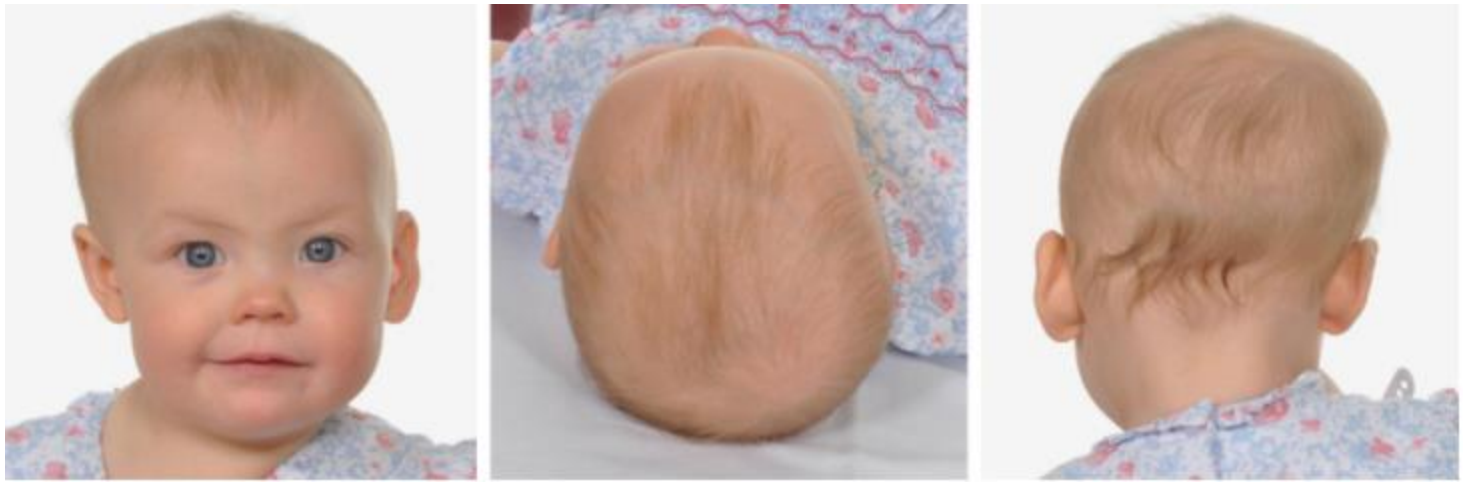
- Fusion of both coronal sutures
- Head can be tall, flat, and wide
- Frequently associated with genetic conditions such as Apert, Saethre-Chotzen or Muenke Syndrome and recommend genetic testing.

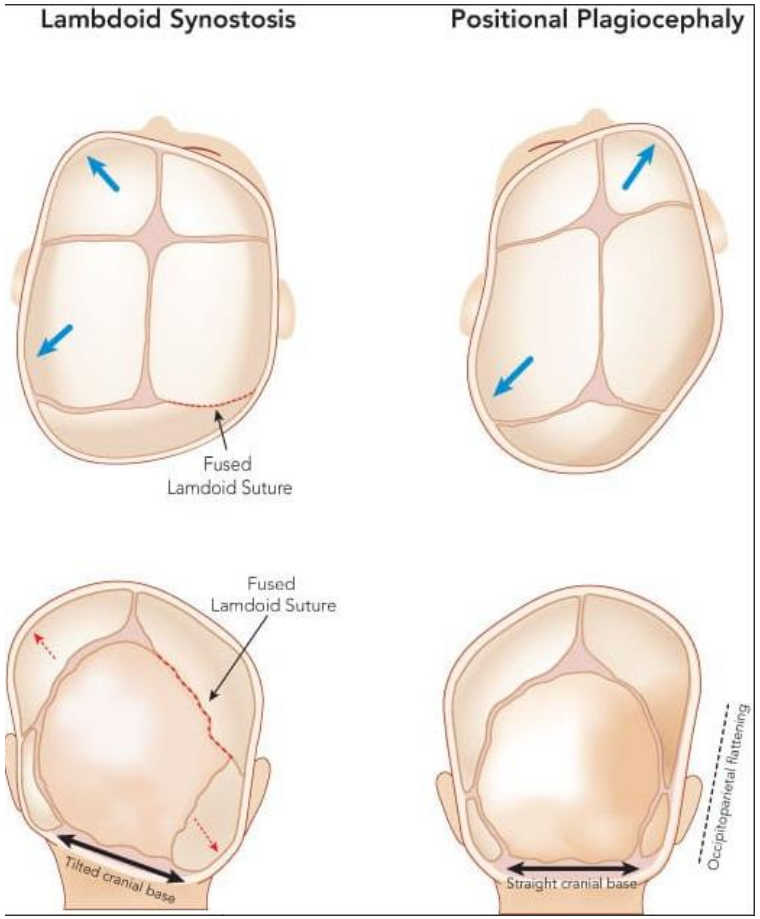




Lambdoid craniosynostosis

- Least common form
- Trapezoid shape
- Protrusion at the back of the head on the non-affected side
- Asymmetrical cranial base





Surgery for Craniosynostosis

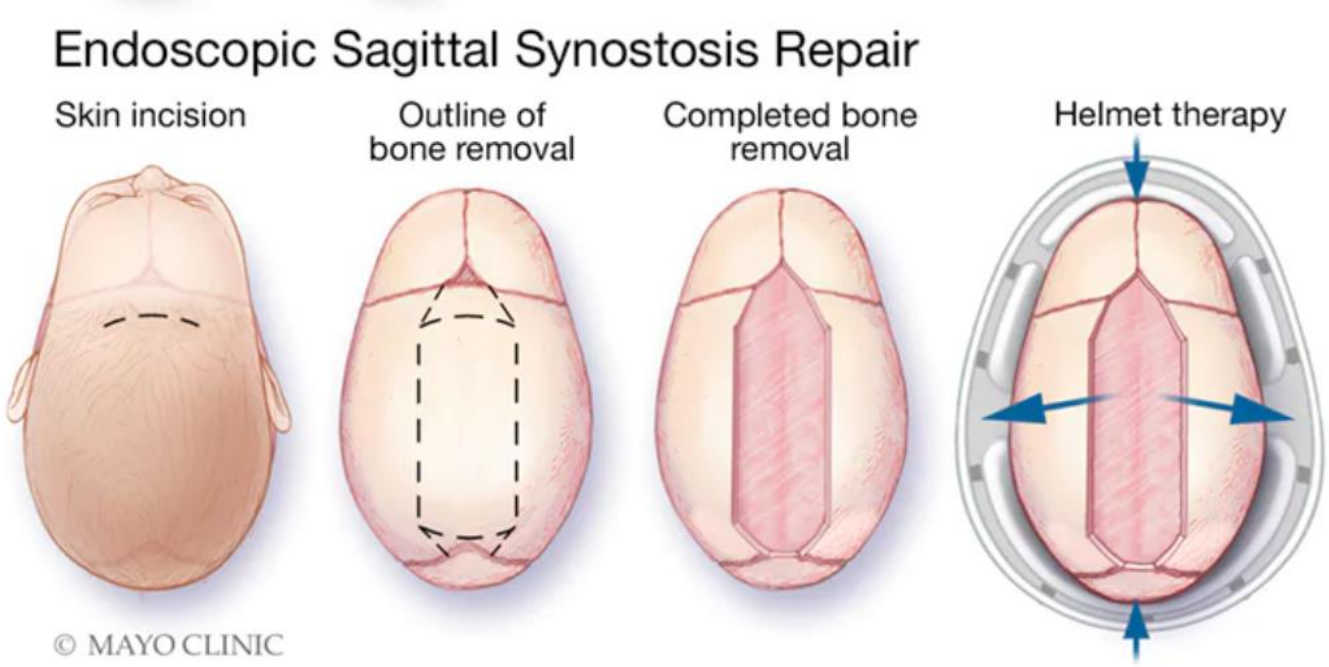
Endoscopic strip craniectomy

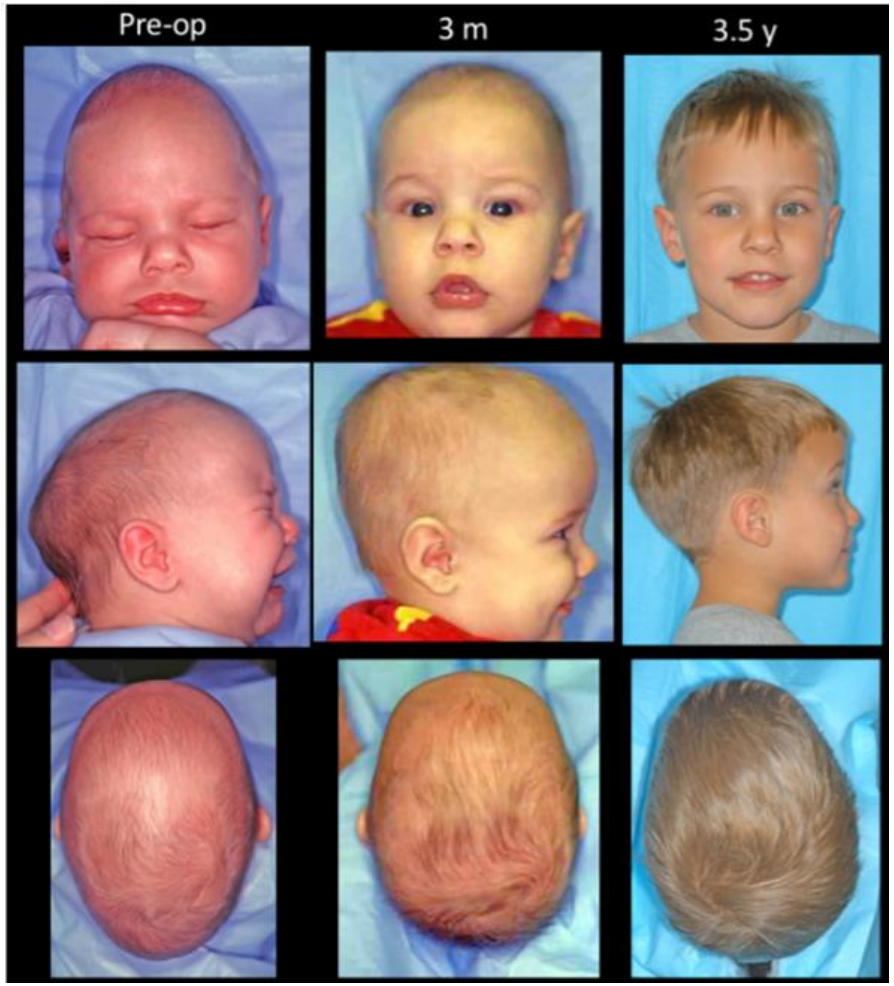
- Minimally invasive, smaller incision
- Less blood loss
- Performed at an earlier age (generally <4 months)
- Requires post-op cranial molding helmet for best aesthetic result

Traditional Cranial Vault Remodeling

- More invasive involving reshaping the cranial bones in a single stage surgery
- Typically requires a blood transfusion and longer hospital stay
- Typically done after 6 months of age
- Can correct area of defect or entire skull; preferred if more than one suture is closed
- Does not require cranial molding therapy

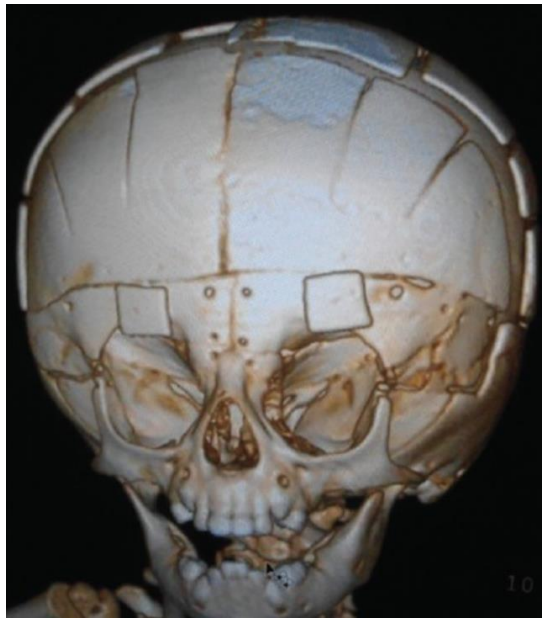
Strip Craniectomy

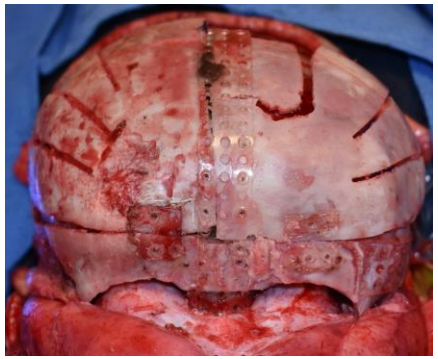


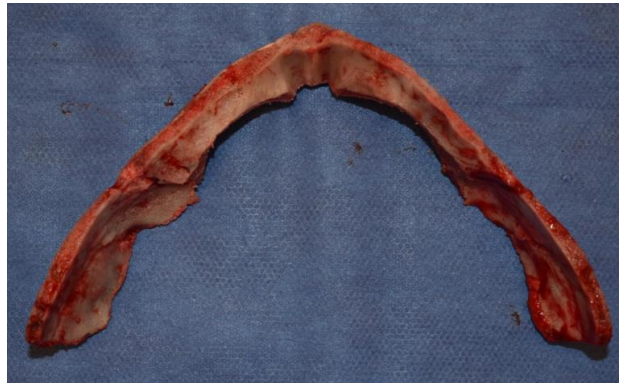


Frontal Orbital Advancement

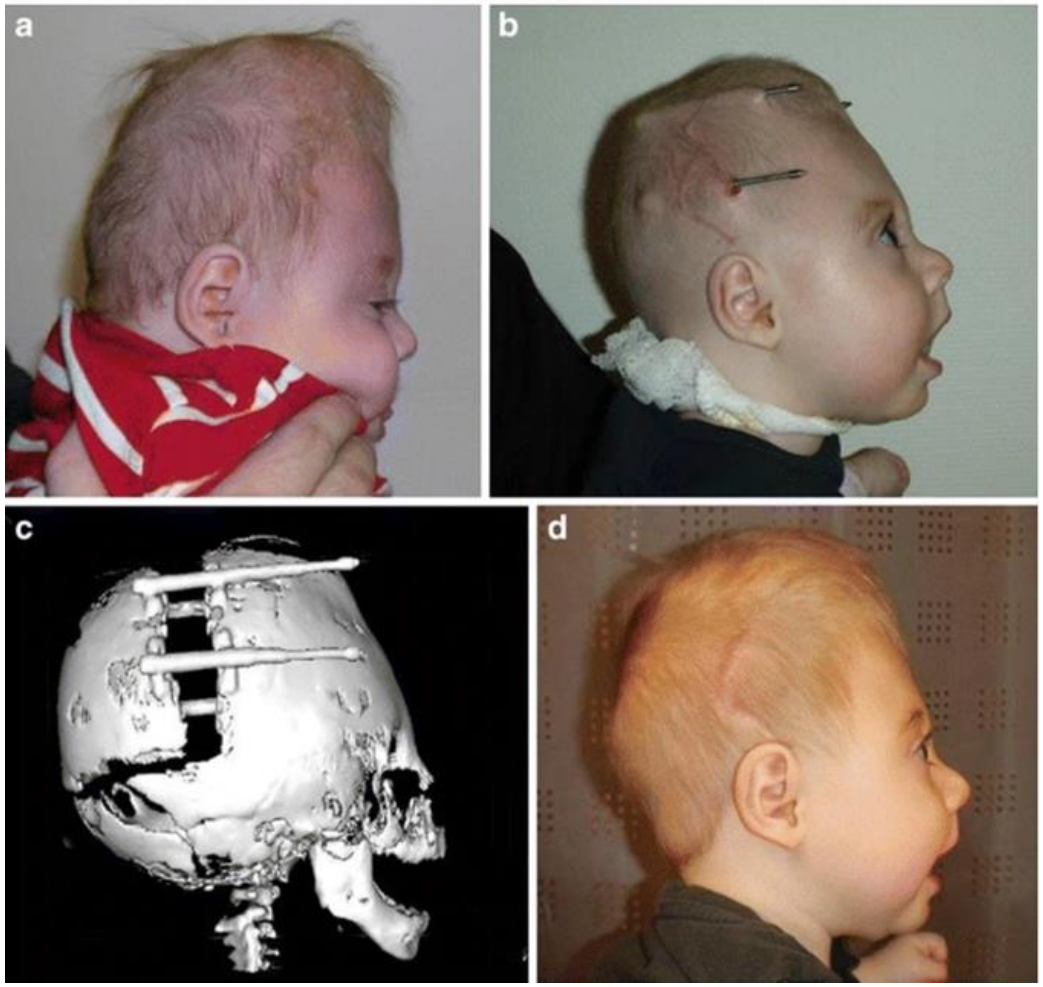
- Expands space inside the skull by reshaping the forehead and orbits
- Can protect the protect the eyes by improving eyelid position
- Used for metopic, unicoronal, or bicoronal craniosynostosis



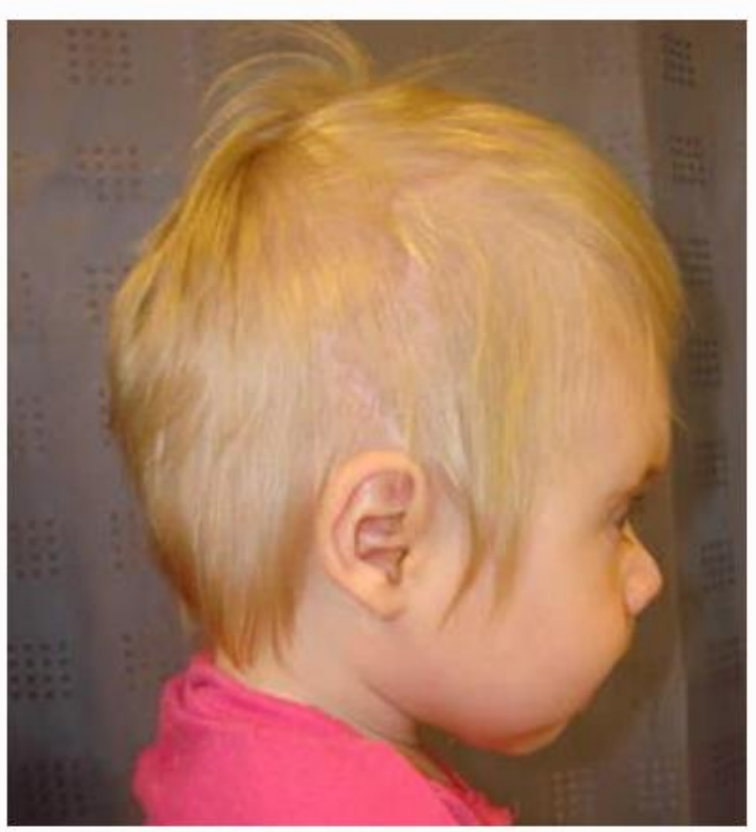




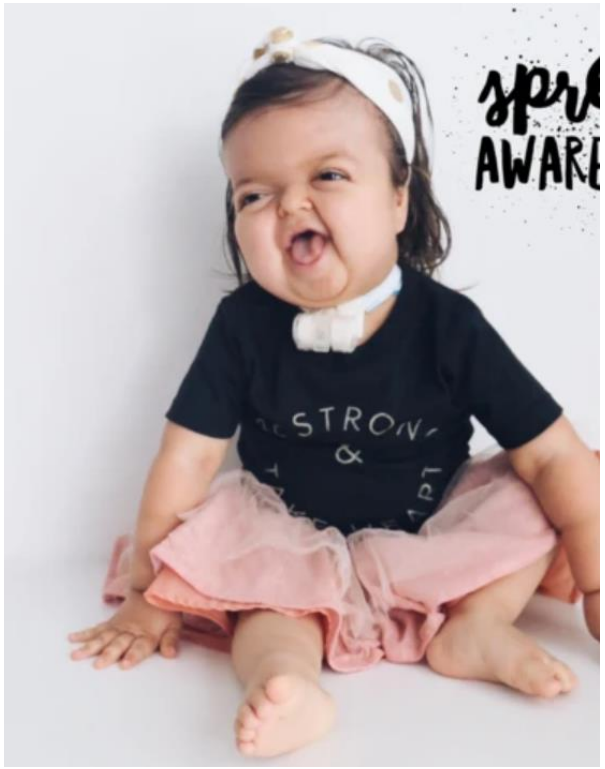
Cranial distraction

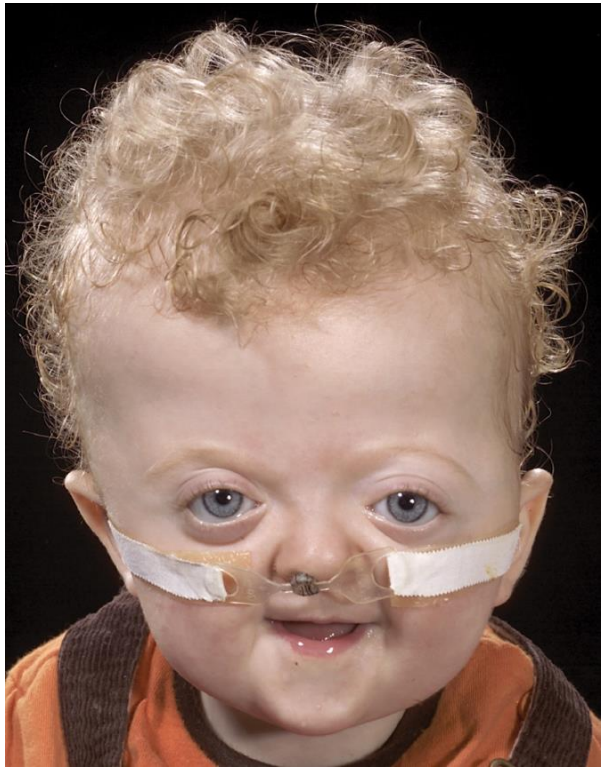


First surgery is two stage posterior cranial distraction. Internal distractors removed after 3 months.



Later surgery involves frontal orbital advancement

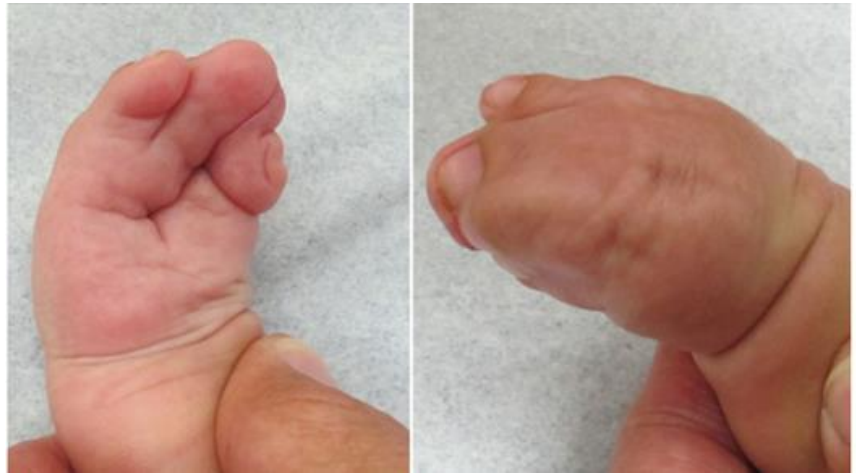




Syndromic craniosynostosis

- Caused by an inherited or genetic condition
- Ranges from mild to severe
- May have hearing loss and dental abnormalities
- Complications include hydrocephalus, sleep apnea, eye exposure issues
- Airway compromise that may require tracheostomy

Apert
Crouzon
Pfeiffer
Syndromes



Crouzon syndrome with exophthalmos

Crouzon syndrome at the age of five

Crouzon syndrome with the postoperative propulsion of face and forehead

Postoperative appearance

Cleft lip and palate

- Incomplete closure of lip and/or roof of mouth
- Unilateral or bilateral, can affect lip or palate or both
- May be complete or incomplete
- One of the most common birth differences ~1/750 babies
- Higher rate in Asians and Native Americans ~1/250 births
- Occurs in the 4th – 7th week of pregnancy when the tissue does not fully close

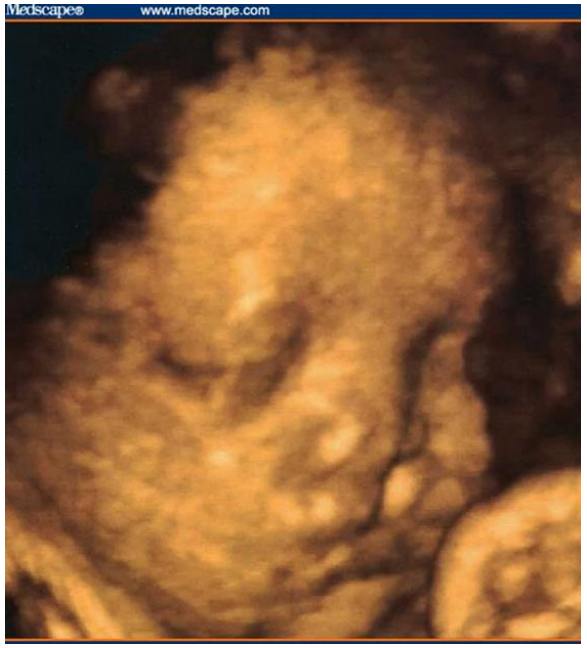
Males are twice as likely to have a cleft lip; females are twice as likely to have a cleft palate.

Greater chance if a sibling, parent, or other relative has a cleft

May be related to a medication a mother may have taken during her pregnancy: *antiseizure medications, acne treatment (Accutane), or methotrexate*

Other factors: vitamin deficiency (folic acid), smoking during pregnancy, substance abuse

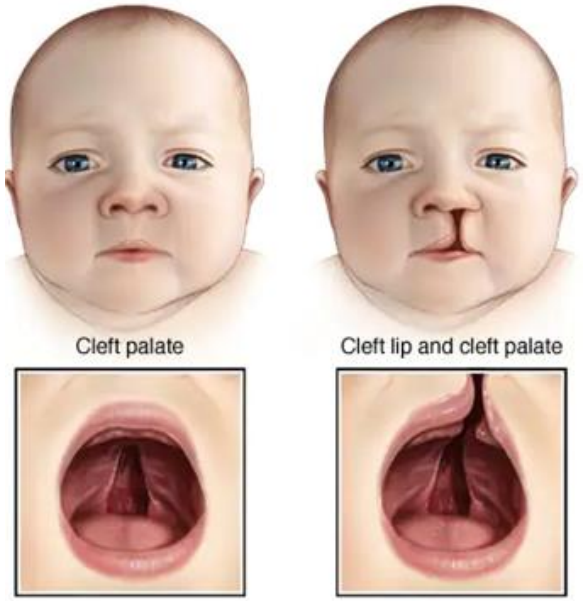
Possible exposure to viruses or chemicals while mother is pregnant

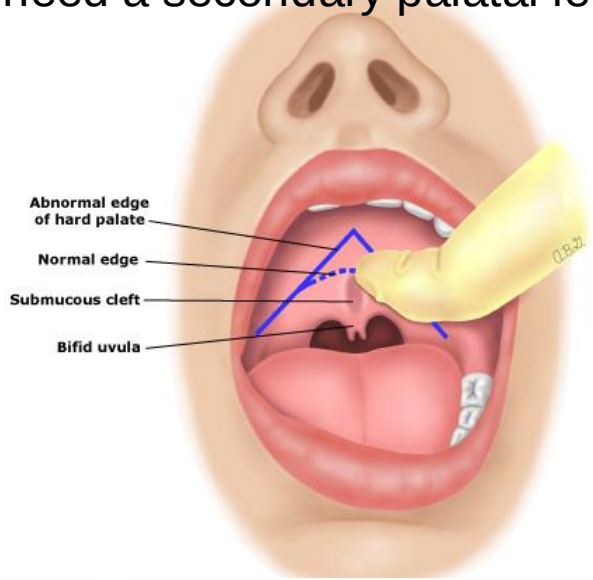


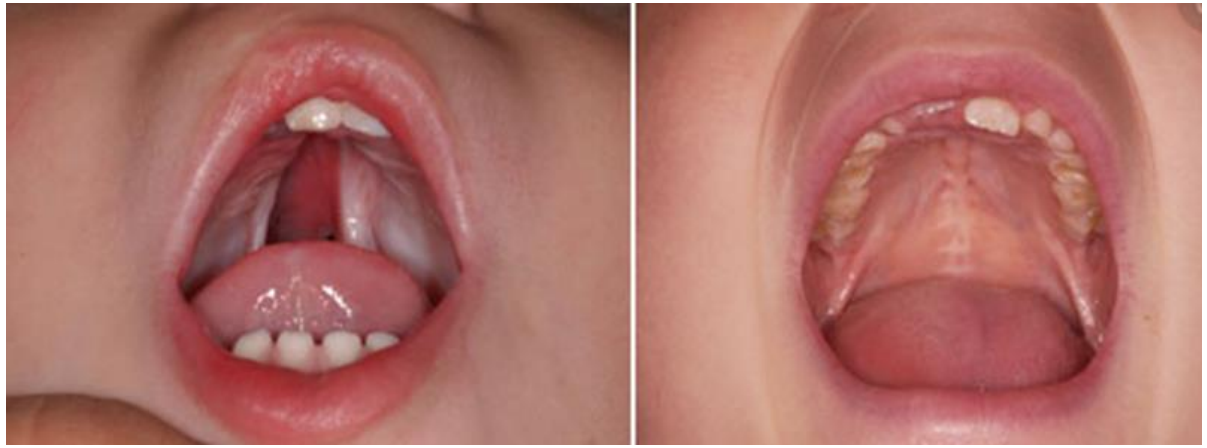
- Cleft lip may be detected on ultrasound
- Early monitoring of adequate weight gain to ensure growth
- Children may have difficulties with eating, breathing, speech, hearing, and dental health
- Requires multispecialty team
  - Plastic Surgery
  - Speech therapy
  - Nutrition
  - Occupational Therapy
  - ENT/Audiology
  - Orthodontist
  - Social Work

Cleft Palate – Submucous cleft

- **Cleft palate** - an opening in the roof of the mouth
- **Submucous cleft palate** - an opening in the muscles of the soft palate beneath a mucous membrane. (May not require surgery)
- Symptoms: poor suction with feeding, nasal regurgitation
- Frequent ear infections, hypernasal speech
- Surgically repaired around 10-18 months before speech development
- May need a secondary palatal lengthening when older



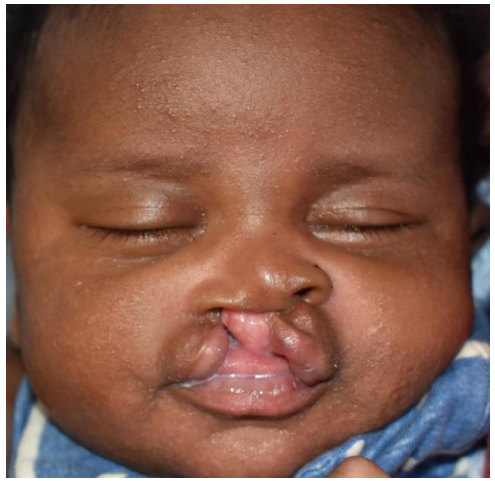


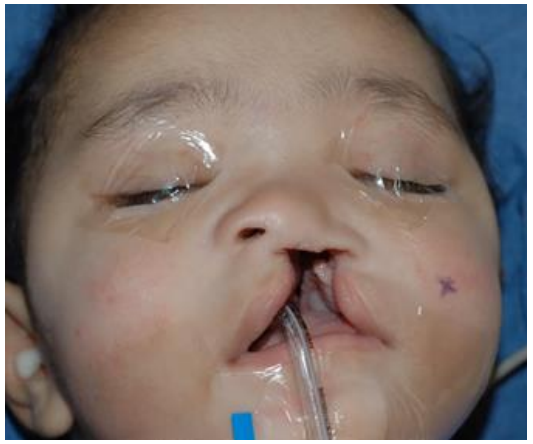
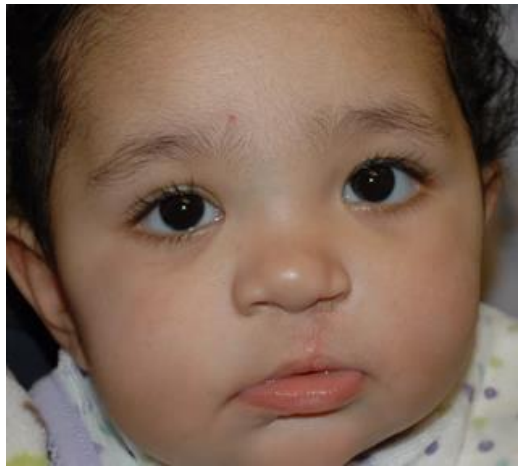


Feeding and Nutrition

- Cleft palate unable to fully breast feed or use regular bottle
- Isolated cleft lip may use regular bottle or breast feed
- Encourage use of expressed breast milk
- Dr. Brown Specialty bottle, Haberman, Pigeon bottle
- Manage GERD
- Monitor for adequate weight gain

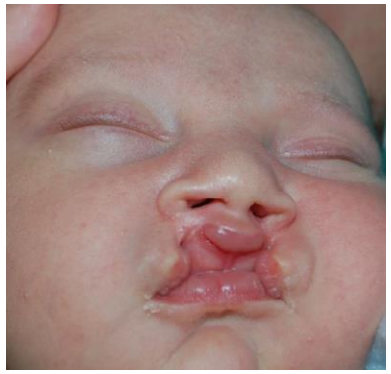
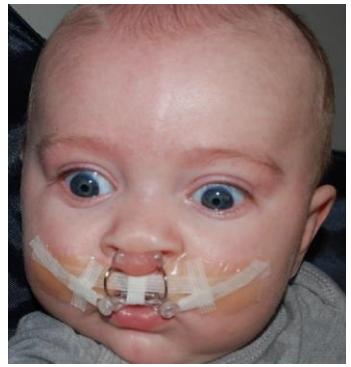
Cleft Lip repair



Unilateral cleft lip

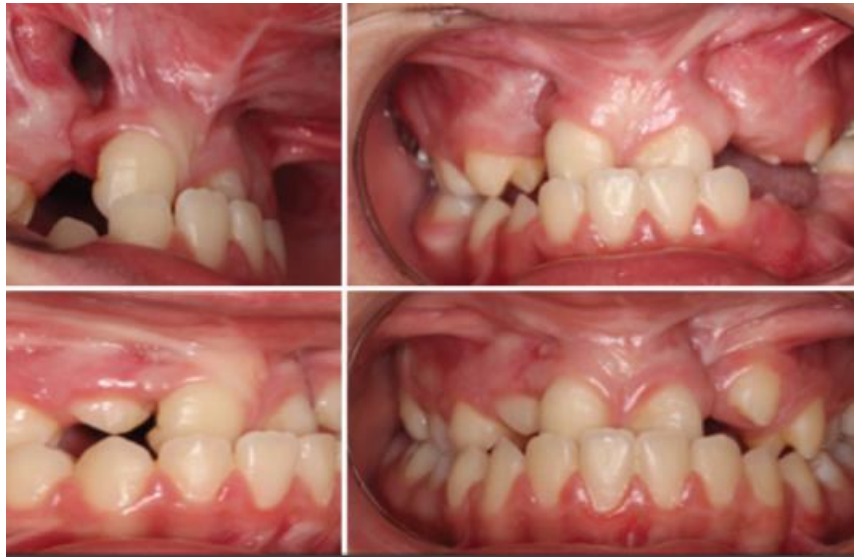
- Performed around age 3-6 months provided adequate weight gain and growth
- Helpful to do lip taping/nasal clips/Nasal Alveolar Molding (NAM) in first few months of life
- May be done in two stages for bilateral or wider clefts:
  - Lip adhesion at 3-4 months of age
  - Final cleft repair around 6-8 months of age

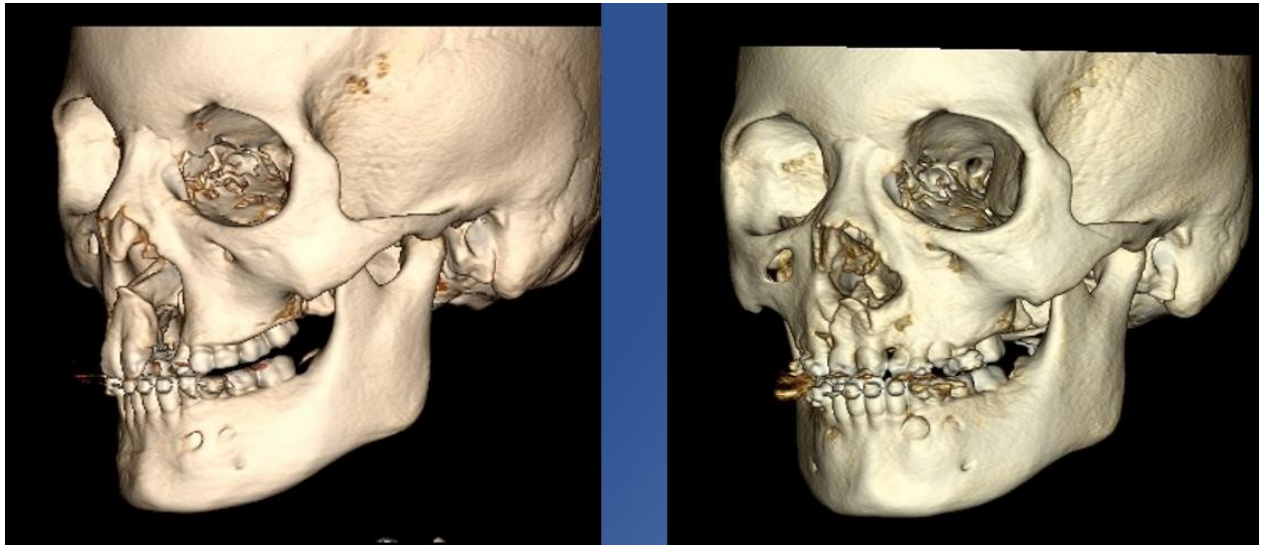




Bilateral cleft lip

Alveolar Cleft: cleft in the gum line

- Alveolar bone graft surgery performed between 6-11 years old
- May need preparation from an orthodontist for palate expansion
- Provides bony support along maxilla for erupting permanent teeth
- Closes fistula that can cause liquids to leak into the nose causing irritation and regurgitation of fluids
- Graft can be taken from iliac crest or use Bone Morphogenic Protein





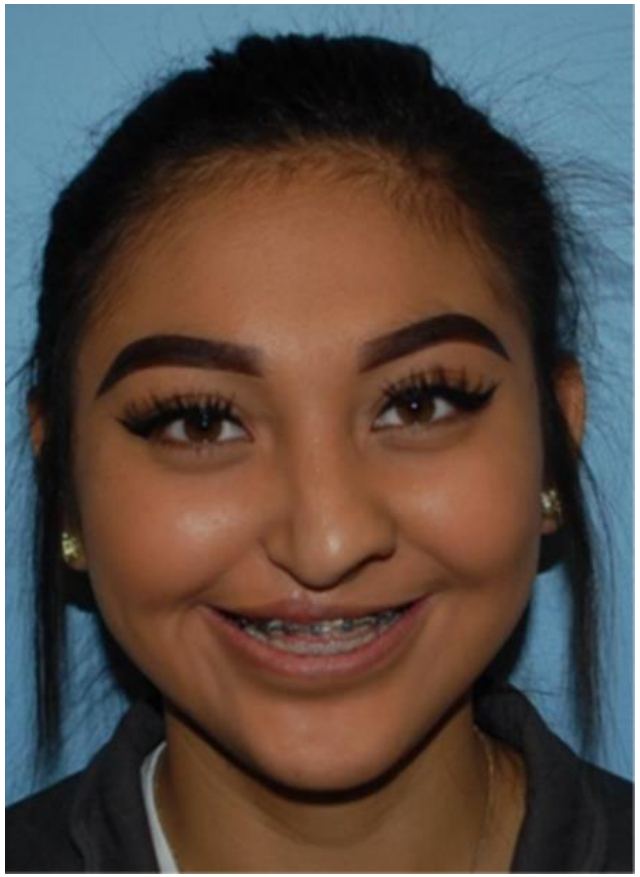
Cleft Surgery for Teens

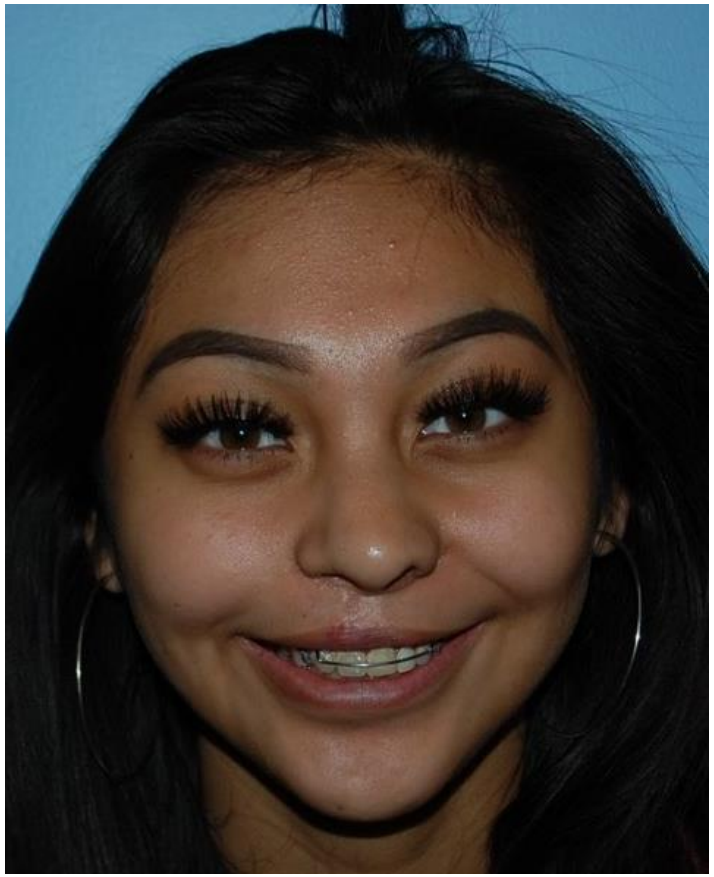
Orthognathic (jaw) surgery

- Patients can have underdevelopment of the upper jaw, resulting in maxillary retrusion and a flattened facial profile
- Surgery on one or both jaws to stabilize bite

Rhinoplasty (nasal) surgery

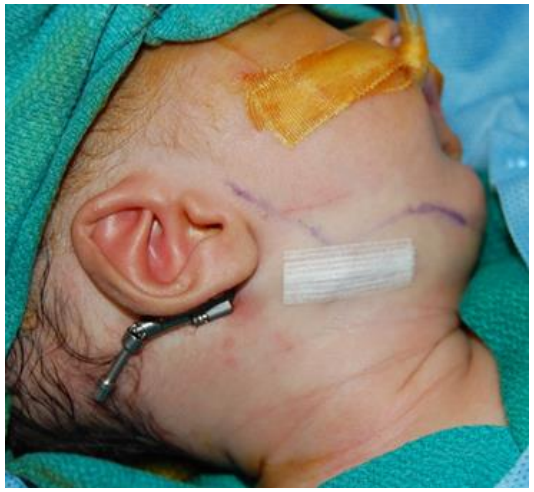
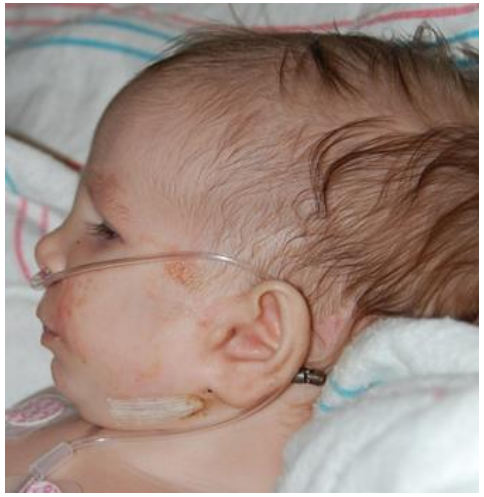
- Definitive septorhinoplasty is often the final intervention for many cleft patients
- Goals are improving symmetry, relief of any nasal obstruction, and long-term stability





Pierre Robin Sequence

- Lower jaw is abnormally small (micrognathia)
- Displacement of the tongue toward the back of the oral cavity (glossoptosis)
- Often have a cleft palate
- Can be present as an isolated sequence or as part of a genetic syndrome
- Correction done with mandibular distraction


Treacher Collins Syndrome
(Mandibulofacial dysostosis)

- Underdevelopment of the zygomatic complex, cheekbones, jaws, palate and mouth
- May have microtia (small or missing ears)
- Can lead to breathing and feeding difficulties

Plastic Surgery 101
The basics

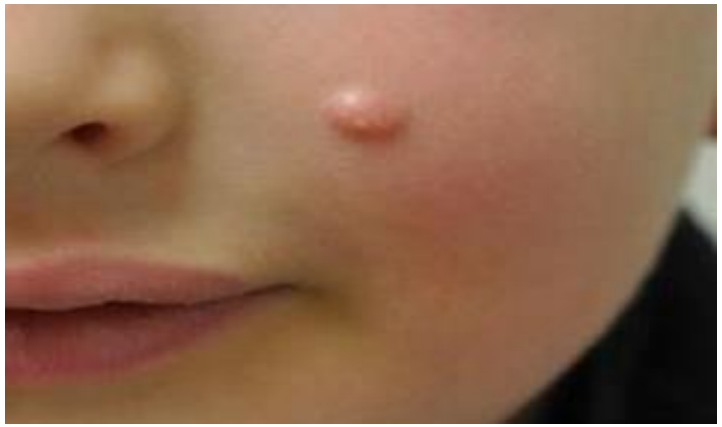
Skin Lesions

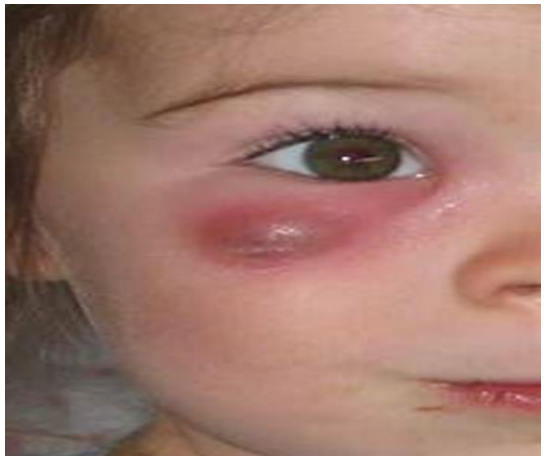
A skin lesion is an area of the skin that is different than the surrounding skin. This can be a lump, sore, or an area of skin that is not normal or is concerning for malignancy or is symptomatic.

The lesion is symptomatic as documented by any of the following: Intense itching, burning, irritation, pain/tenderness, chronic, recurrent or persistent bleeding, physical evidence of inflammation (e.g., purulence, oozing, edema, erythema, etc.).

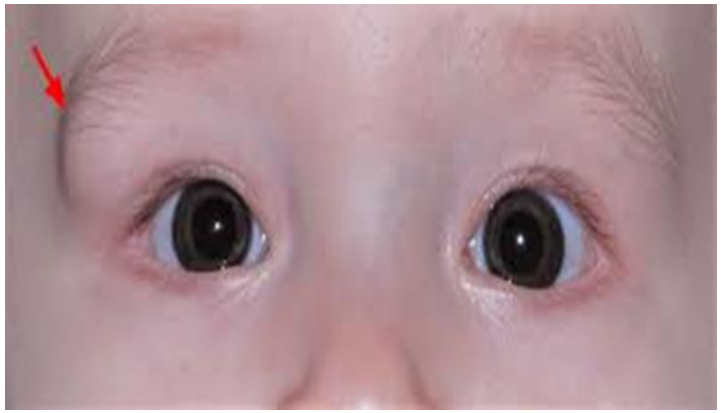
Cysts, Nevi, and ‘omas (oh my)

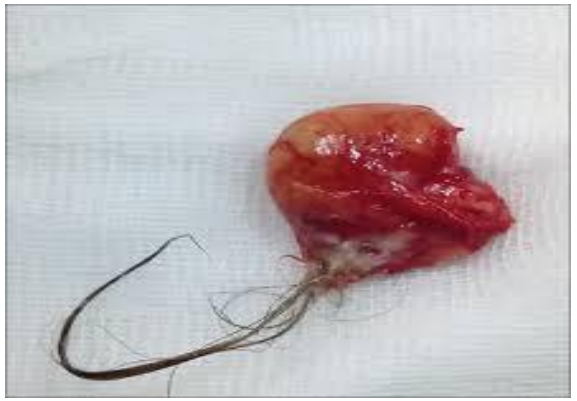
- Dermoid
- Pilomatrixoma
- Pyogenic Granuloma
- Spitz Nevus
- Nevus Sebaceous
- Congenital Melanocytic Nevus



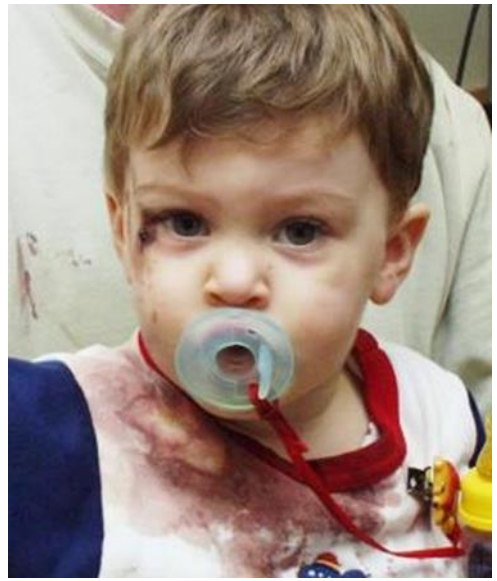


Pilomatrixomas
Benign calcified growths of the hair follicle





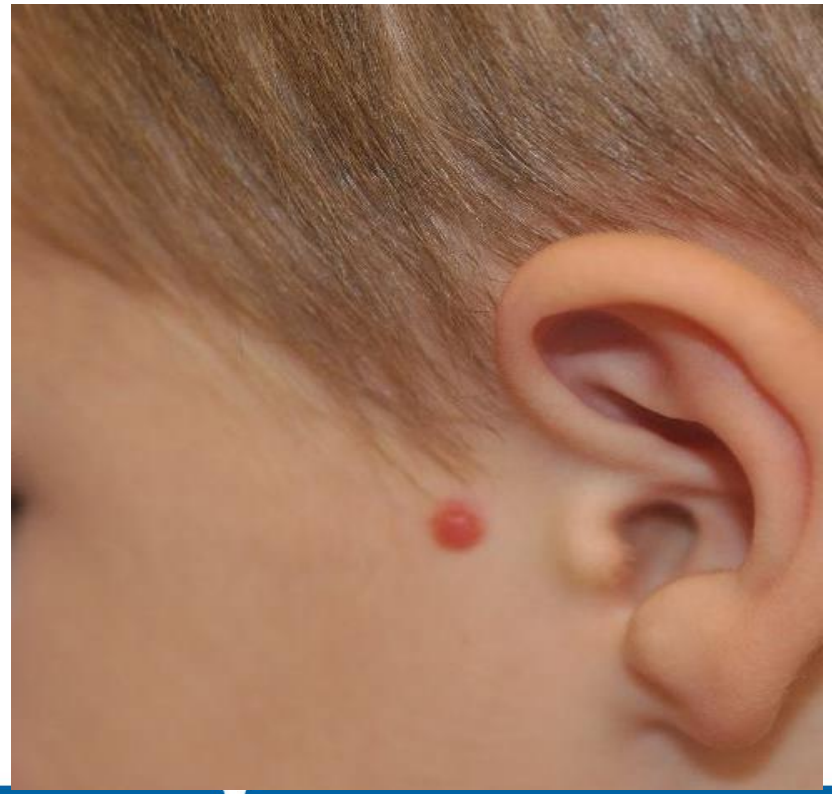
Dermoid Cyst
Filled with fluid and skin or hair cells – formed in utero



Pyogenic Granuloma
Fast-growing, benign lesions made of abnormal capillaries

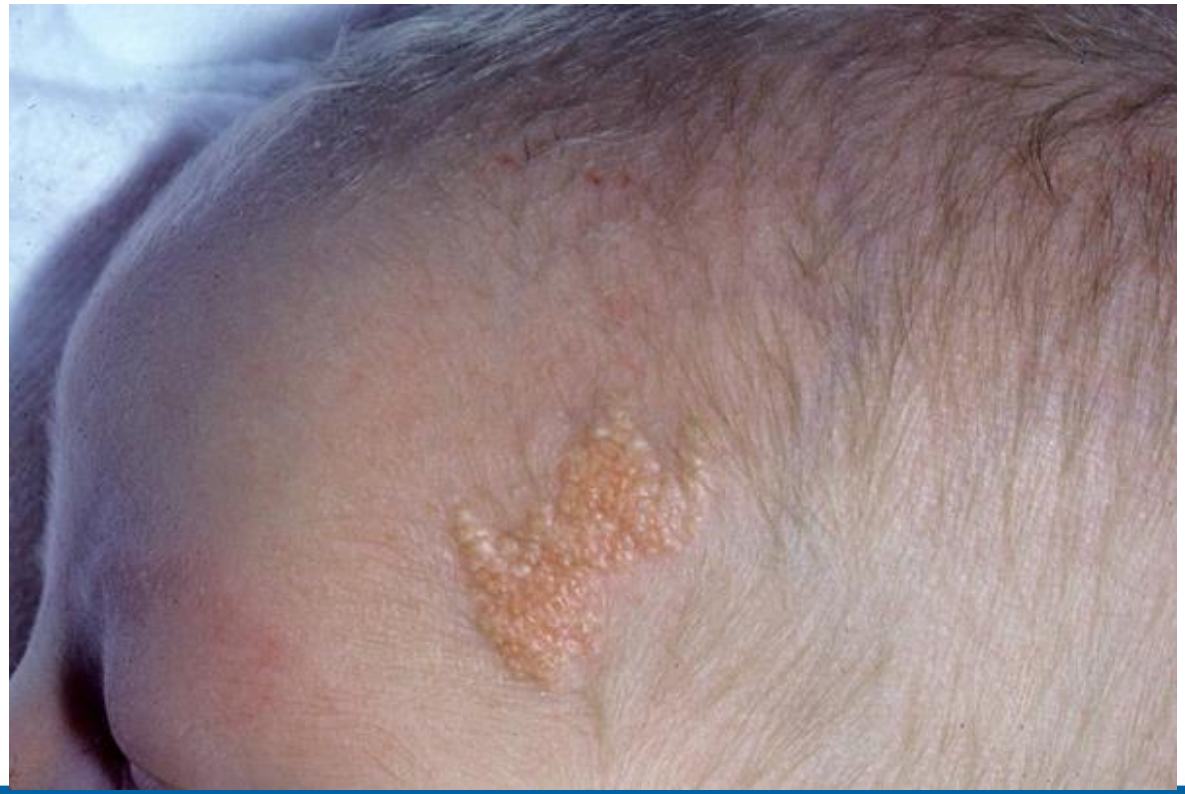
Spitz Nevus

Uncommon type of benign melanocytic nevus



Nevus Sebaceous

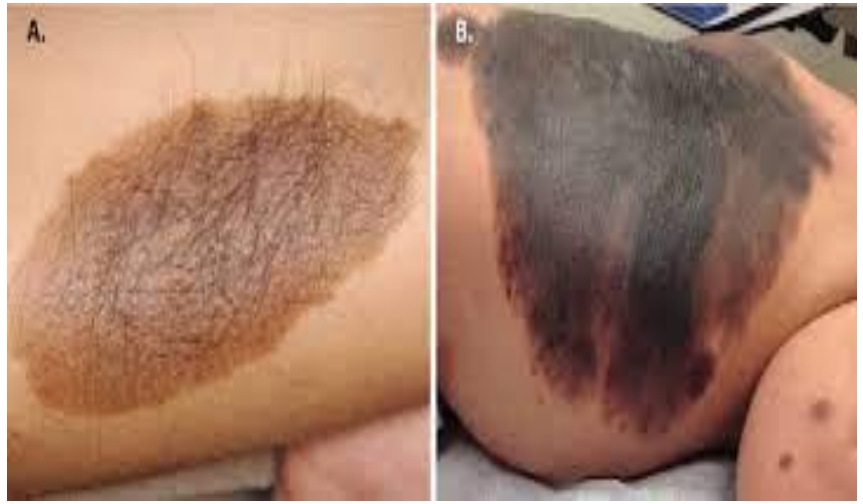
Benign congenital lesion due to growth of excess sebaceous glands

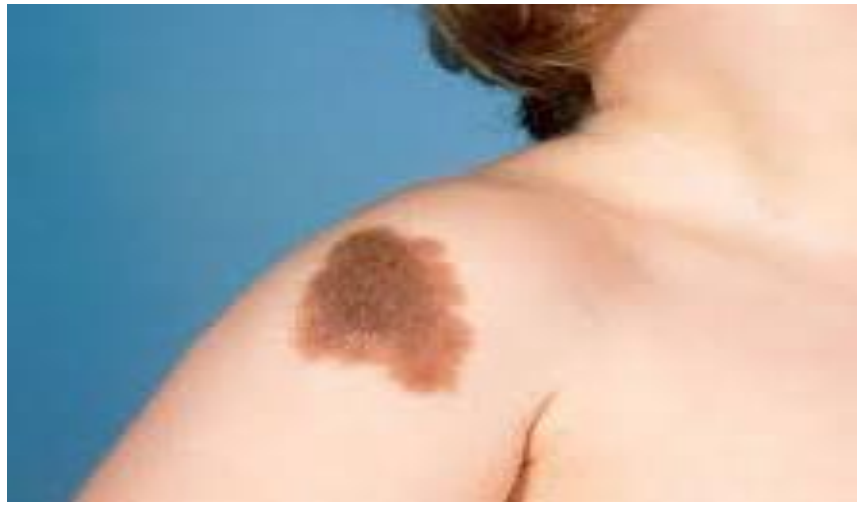


Congenital Melanocytic Nevus

Present at birth as pigmented patches and grow proportionately with the child.

Risk of melanoma exists





When to Excise

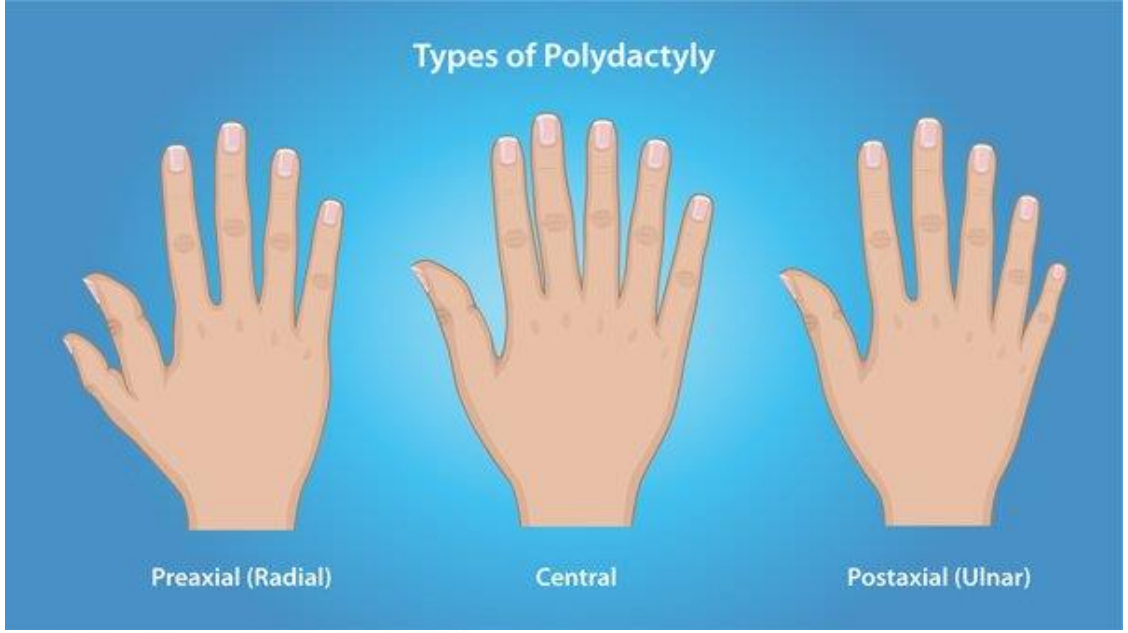
Common reasons to remove lesions are changes suggestive of cellular atypia such as changes in color, texture, size or consistency
Removal for diagnostic purposes
Removal for cosmetic appearance
Lesions that are symptomatic (itching, painful, bleeding)
Lesions that are predisposed to inflammation or infection

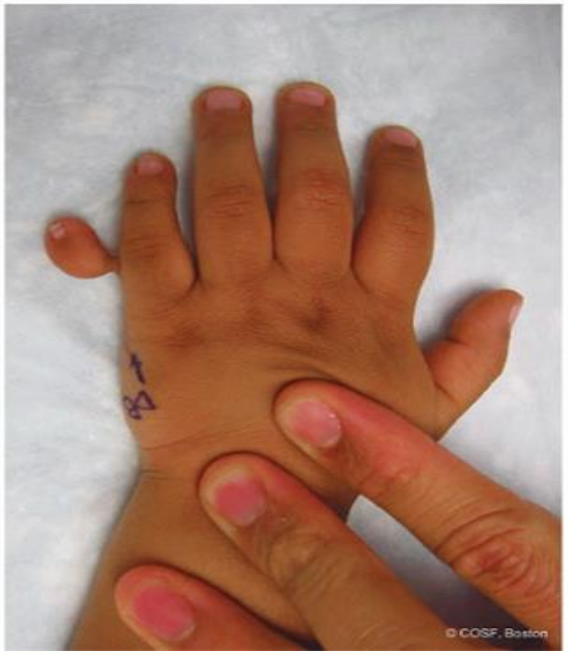
A little bit extra…Polydactyly

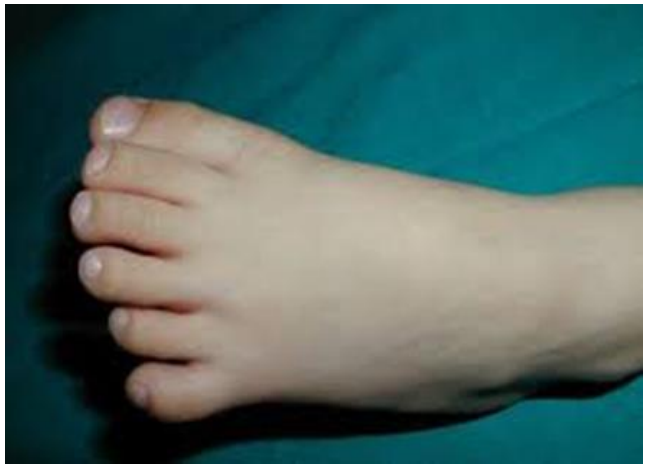
Extra digit may be painful/risk of infarction

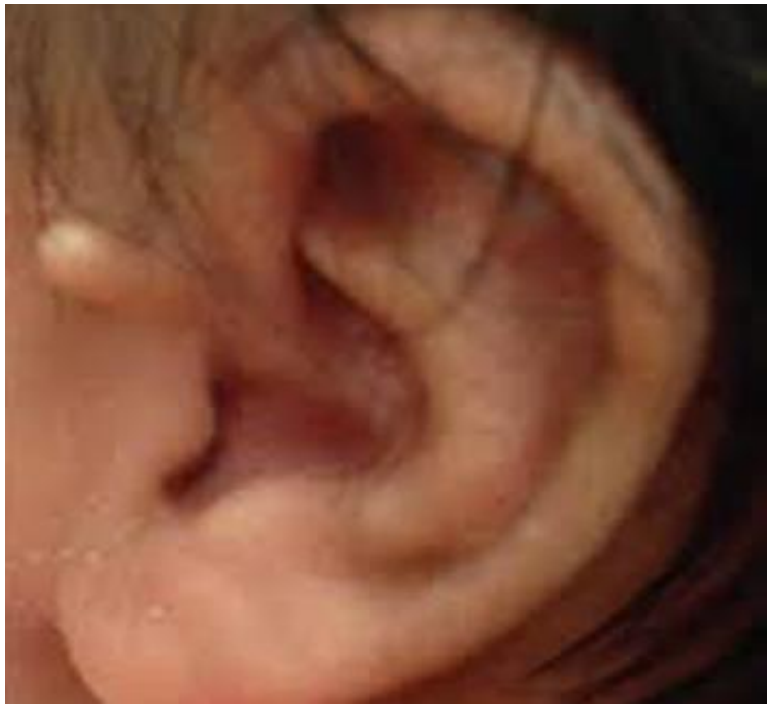
Less than 3mm base AND less than 3 months of age – office excision under local anesthesia- can be done in OR after 6 months of age or combined with another surgery

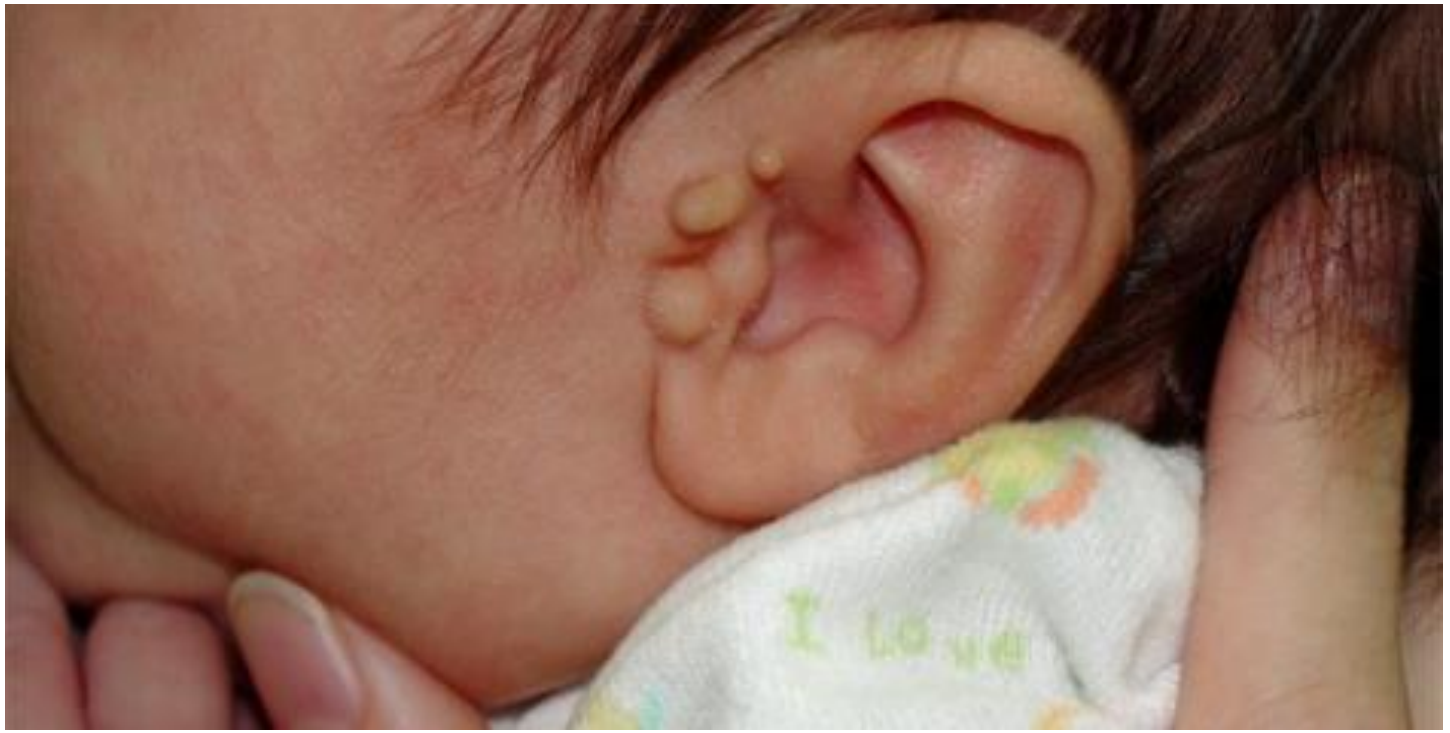
Polydactyly with bone attachment requires surgical reconstruction at 1-3 years of age under general anesthesia.







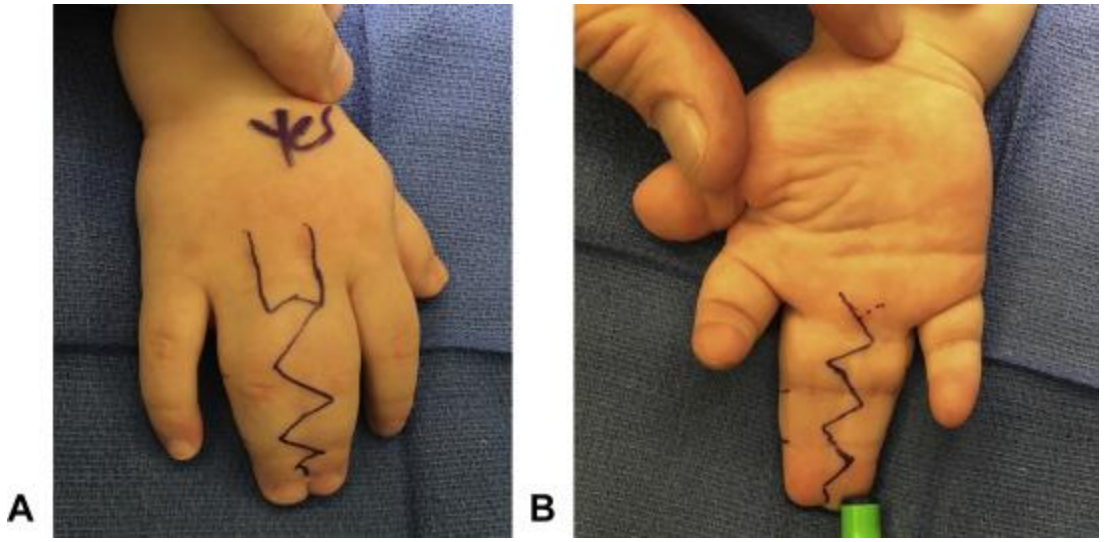


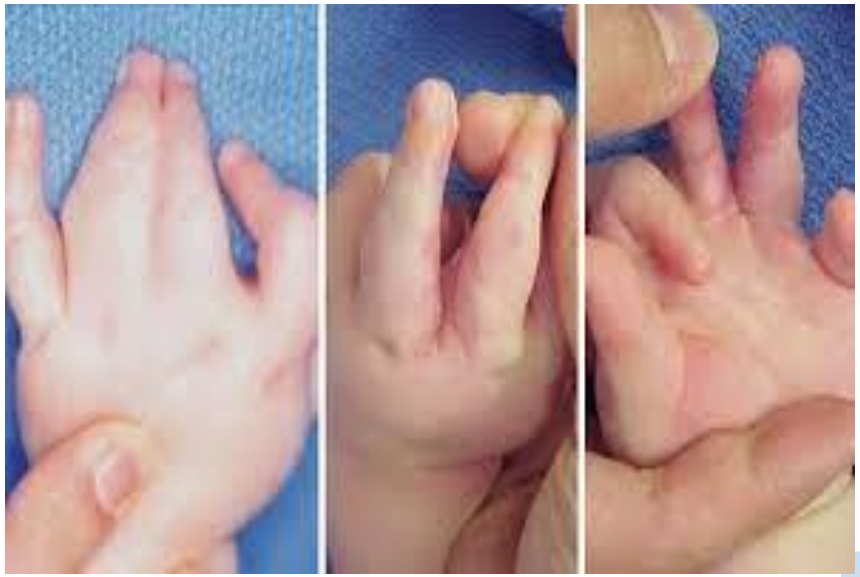


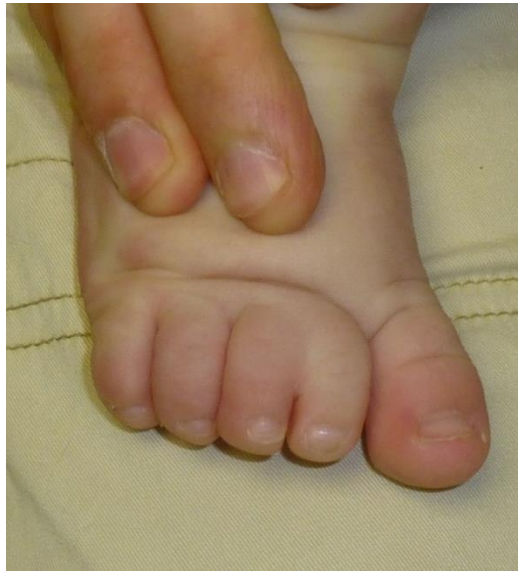
A little bit extra… Accessory Tragus

- Sometimes called Pre-auricular/Branchial Remnant, Ear Tag
- Common congenital anomaly of the external ear

It's okay
guacamole
I'm extra, too.







Syndactyly “Webbed”

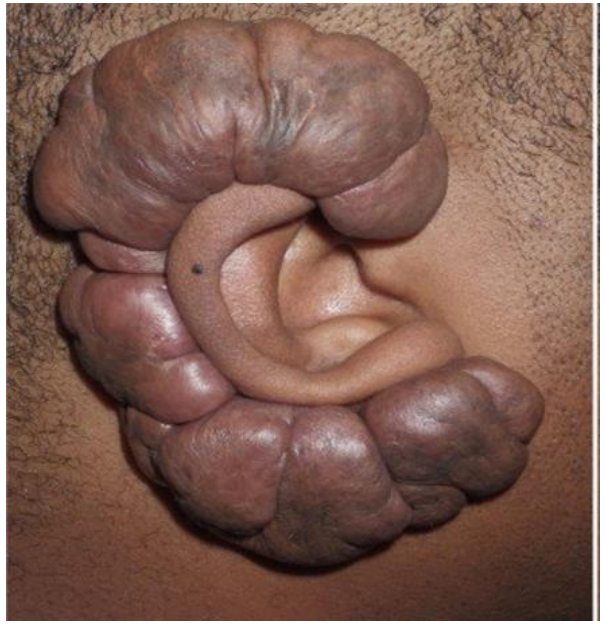

HEHH... WORLD WIDE WEB
DOESN'T HAVE TO DO WITH SPIDERS
imgflip.com

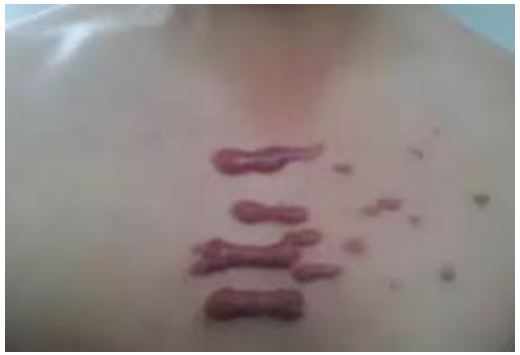
*Yes, even Dr 90210 leaves a scar

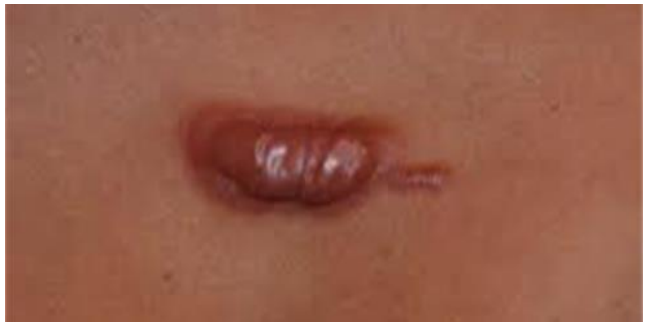
Scars:
Tattoos with better stories

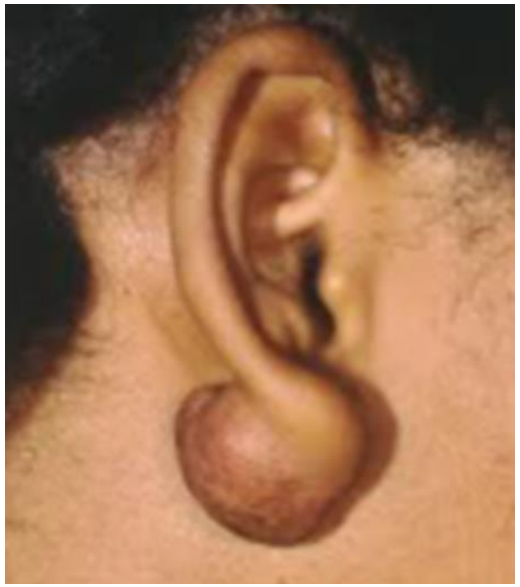
No matter how talented a surgeon is:

There. Will. Be. Scarring.





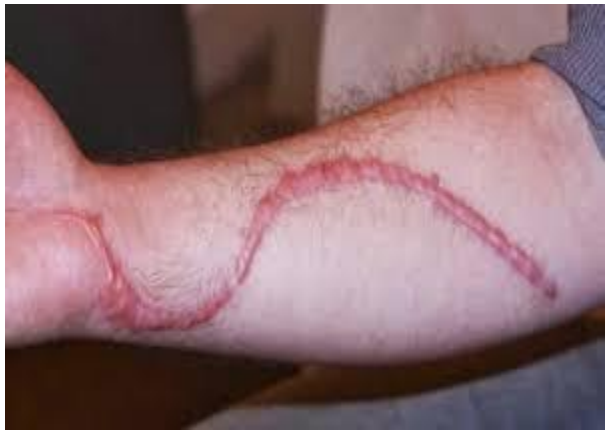




When Scars Misbehave

Keloid

- Raised scars that are darker than the surrounding skin at a site of previous injury/surgery
- Unpredictable, it is not understood exactly why keloids form in certain people or situations. Often itchy, slightly tender, can be painful to the touch while growing
- Factors that promote keloid formation include infection, chronic inflammation, burn injury, and piercings
- Can become quite large, **extending beyond the original borders of the wound**



When scars misbehave

Hypertrophic Scars

- Elevated scar **within borders of original wounds**. Often seen in flexor regions
- Often caused by tension
- Rapid growth phase up to 6 months, possible regression 12-18 months
- Less likely to be associated with skin pigmentation
- More responsive to scar treatments


OH BEHAVE

Please remember

- There are many things we watch over time before doing anything. First appointment may just be a “snapshot” and we will follow over weeks-months
- Refer post axial polydactyly before 3 months age for in office excision (the younger the better)
- We offer telehealth -wonderful option for many diagnosis (newborns with accessory tragus, polydactyly) and follow ups
- We rarely remove things same day- insurance approval, may need OR (type of lesion, location, fears)
- We usually never operate before 6 months (risk of anesthesia is that of general population)
- We love to combo (no fries and drink though)- if child is having another sedated procedure we will work with other departments to do at the same time
- Scars take time- but we can help

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816-234-3020

CMH Website:
www.childrensmercy.org
Find a provider/Plastic Surgery

Websites

- American Cleft Palate – Craniofacial Association https://acpa-cpf.org/acpa-family-services/
- Center for Disease Control and Prevention https://www.cdc.gov/ncbddd/birthdefects/craniosynostosis.html
- Children's Craniofacial Association www.ccakids.org
- Children’s Hospital of Philadelphia https://www.chop.edu/centers-programs/craniofacial-program
- Cleft Lip and Palate Association https://www.clapa.com/
- My Face – Changing Face, Transforming Lives https://www.myface.org/
- The National Craniofacial Association https://www.faces-cranio.org/
- NORD National Organization of Rare Disorders https://rarediseases.org

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Children's Mercy
LOVE WILL.