

Craniofacial Clefts and their Repair

Our Ideology

Prof. Dr. Dr. Srinivas Gosla Reddy

MBBS, MDS, FDSRCS (Edin.), FDSRCS (Eng.), PhD

Dr. Rajgopal R. Reddy

MBBS, BDS, FDSRCS (Glasg.)

Dr. Likith V. Reddy

MD, DDS, FACS

Dr. Sriram Damaraju

MS, MCh



Diagnosis of Craniofacial Anomalies should place more emphasis on how to plan a **treatment protocol**

This presentation will, therefore, place emphasis on **facial balance** and **imbalance** rather than “syndromes” and other such terminologies.



Five Facial Ethnic Forms



Caucasian



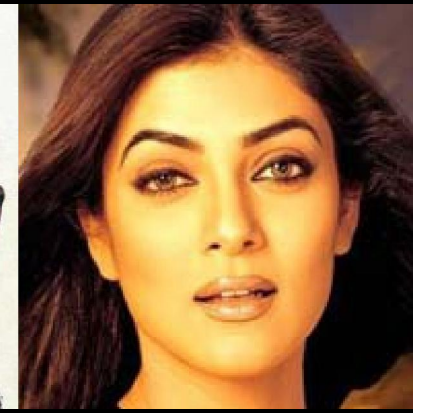
Mongoloid



Latin American



African



Asian

Irrespective of the ethnicity of an individual
“**Facial Balance**” and not “**Facial Symmetry**”
dictates our perception of beauty



Five Congenital Facial Defects



Ears

Eyes

Nose

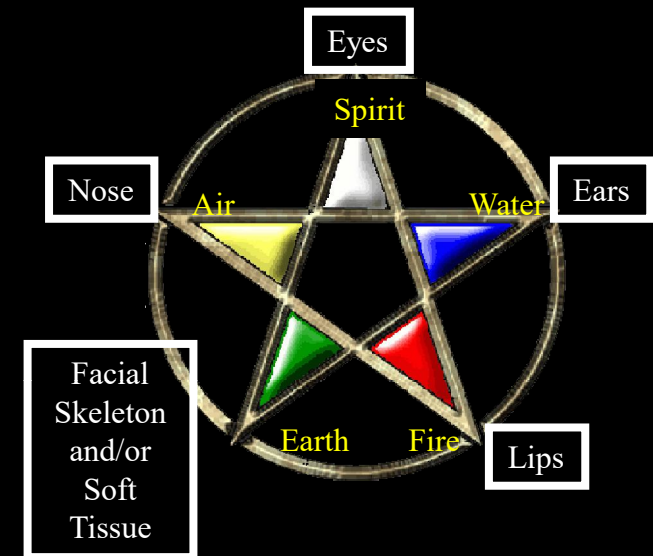
Lips

Facial
Skeleton

Most of the above patients have
Facial Symmetry but lack **Facial Balance**



Five Congenital Facial Defects



Eyes

Ears

Nose

Lips

Facial Skeleton

Complete Facial Imbalance



www.craniofacialinstitute.org

DIAGNOSIS OF CRANIOFACIAL CLEFTS



CLASSIFICATION OF CRANIOFACIAL ANOMALIES

Any classification should be an ideal diagnostic tool and further an agenda to find a common treatment protocol.

We have attempted to classify craniofacial anomalies into **FOUR** groups depending on the site and type of defects (**Morphology**)

This classification is made up of two steps.

Step I: Identification

Step II: Classification

We call this **SAILER'S MORPHOLOGICAL CLASSIFICATION** of craniofacial anomalies



SAILER'S MORPHOLOGICAL CLASSIFICATION

STEP I

RING I

Deformity evident on APPEARANCE

Eyes Forehead

Nose Ears

Mouth Chin

Malar region

Superior Skull

Posterior Skull

RING II

Deformity evident on EXAMINATION

Palate

Tongue

Nostril

Outer ear

Teeth

RING III

Deformity evident on INVESTIGATION

Craniofacial Sinuses

Facial Bones

Facial Muscles

Facial Spaces

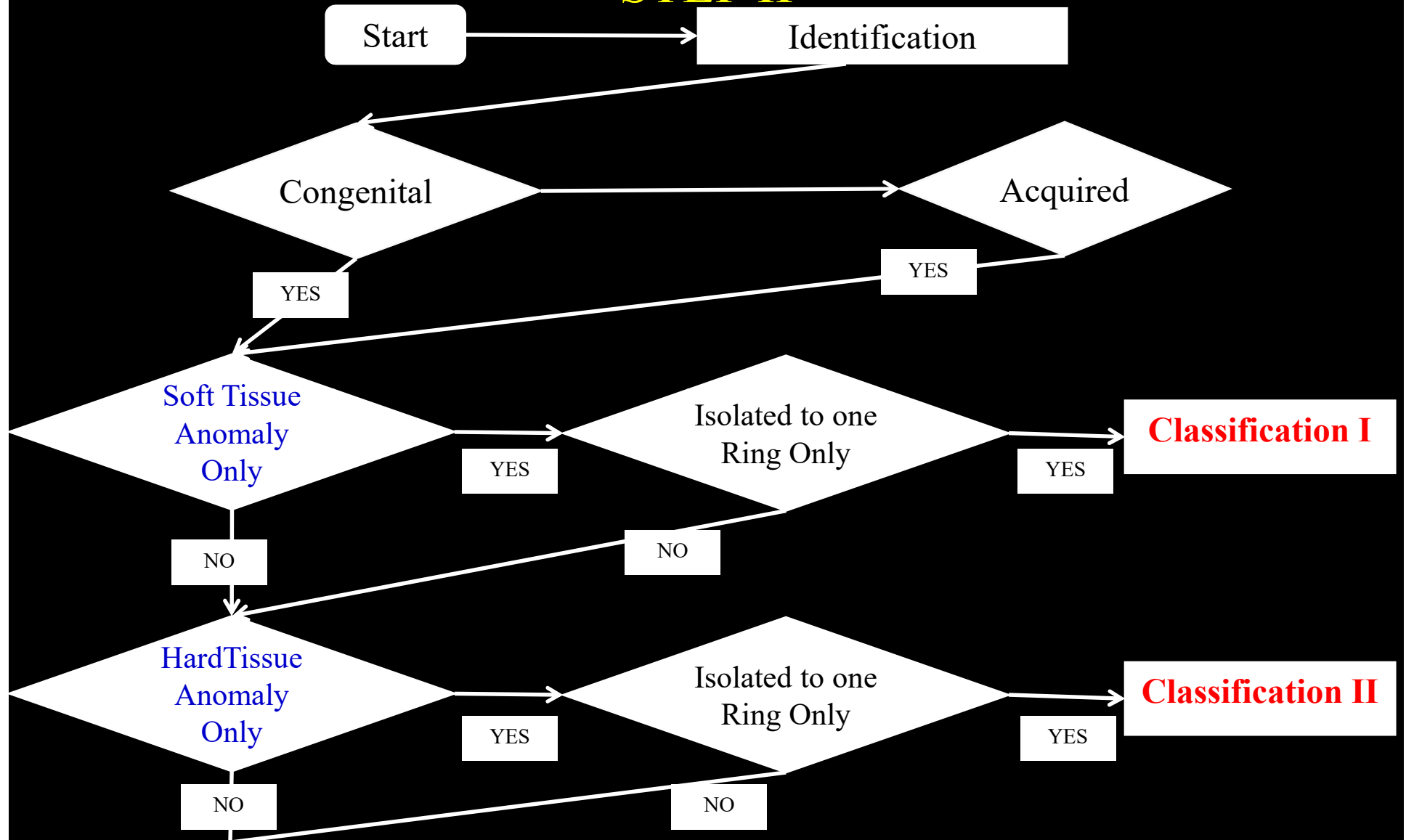
Brain

Spine



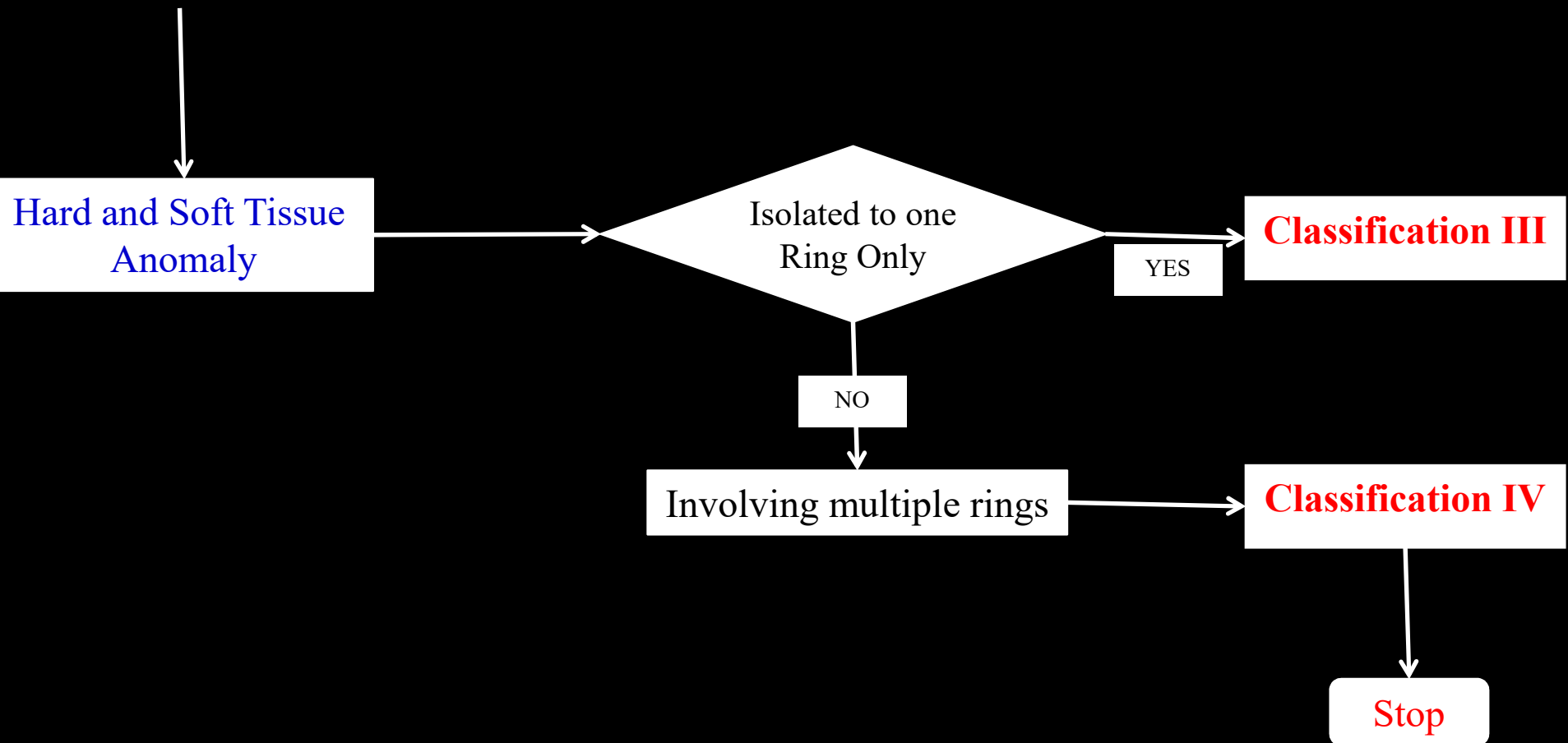
SAILER'S MORPHOLOGICAL CLASSIFICATION

STEP II



SAILER'S MORPHOLOGICAL CLASSIFICATION

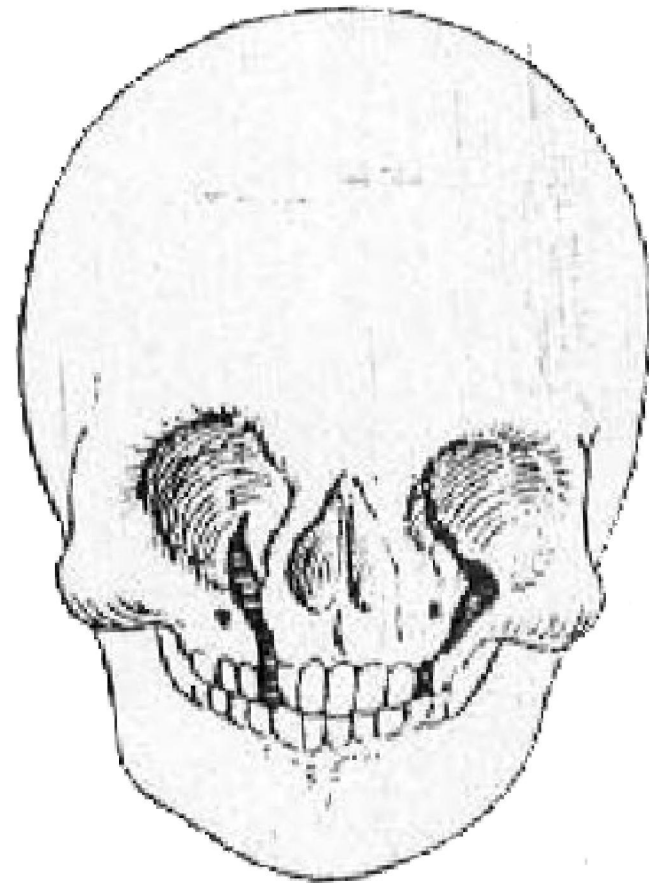
STEP II



Craniofacial Clefts



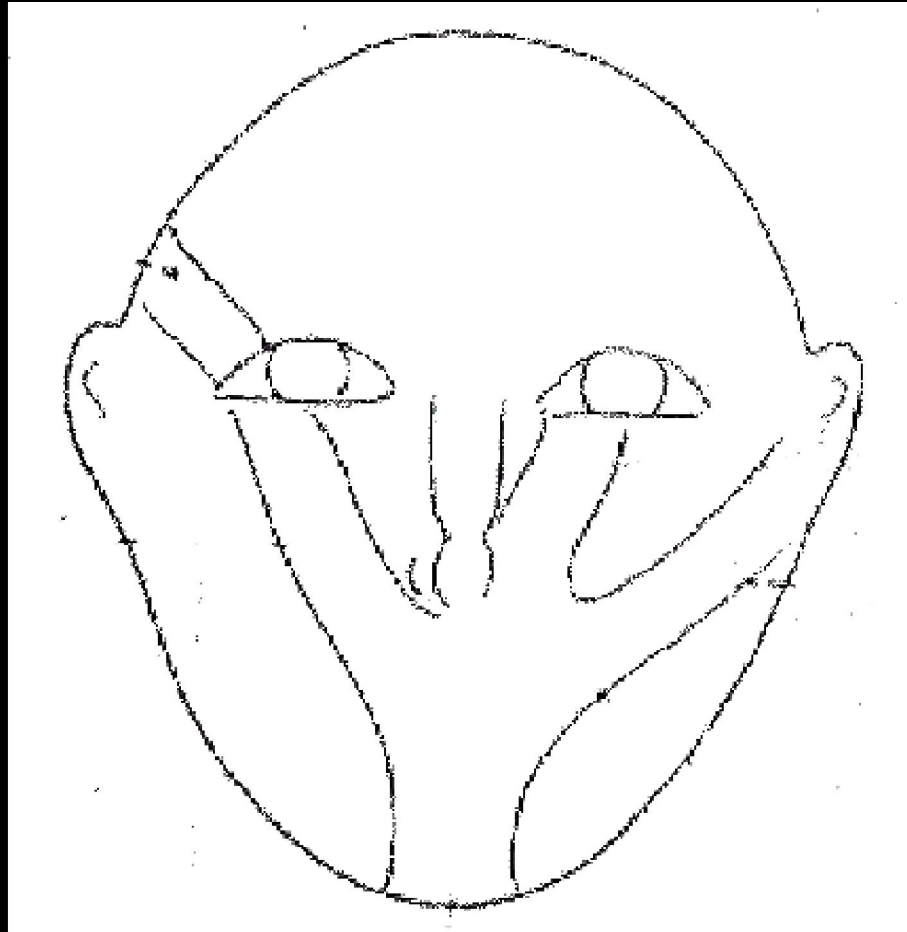
Craniofacial Clefts



Boo - Chai Classification



Craniofacial Clefts

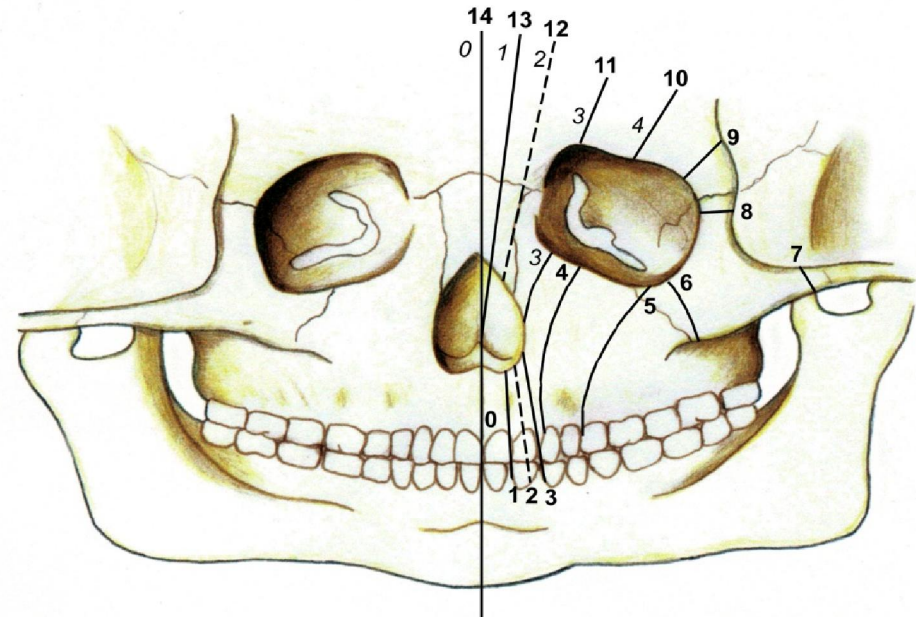
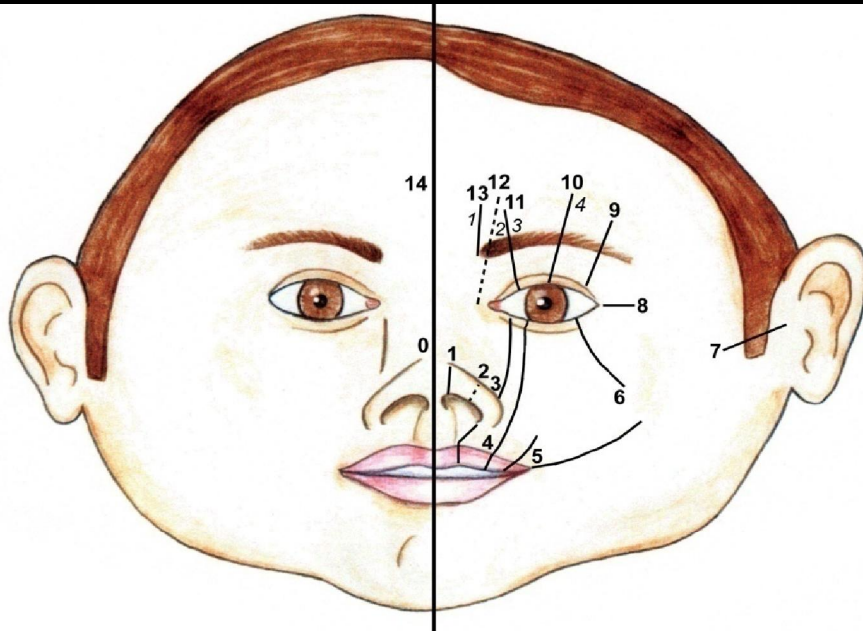


American Association of Cleft Palate Rehabilitation
(AACPR) Classification of Facial Clefts



www.craniofacialinstitute.org

Craniofacial Clefts



TESSIER CLASSIFICATION

- Introduced by Paul Tessier
- It is the most comprehensive and popular classification of craniofacial clefts
- Divided into **soft tissue and hard tissue defects**

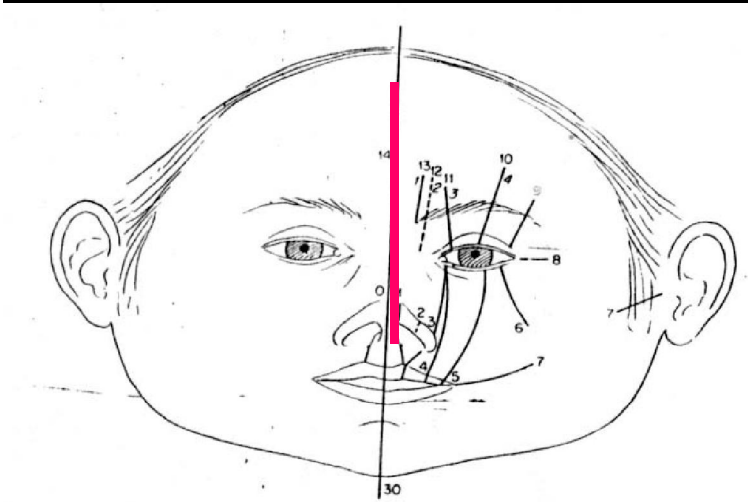


Craniofacial Clefts Soft Tissue Defects



Craniofacial Clefts

Soft Tissue Defects

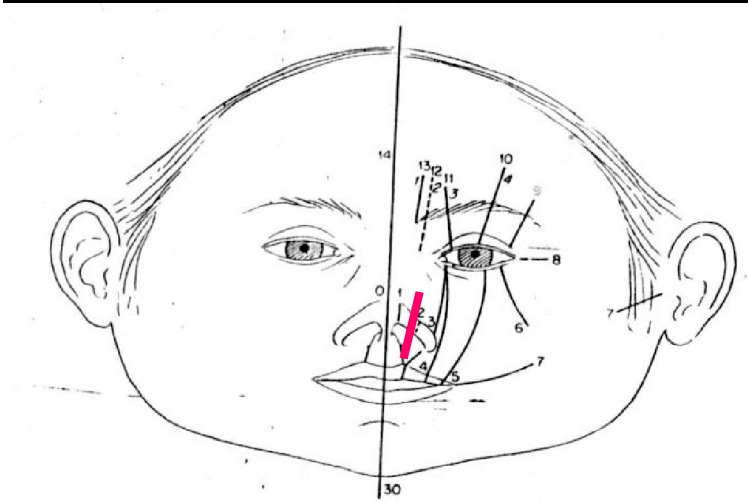


Tessier # 0 facial cleft



Craniofacial Clefts

Soft Tissue Defects

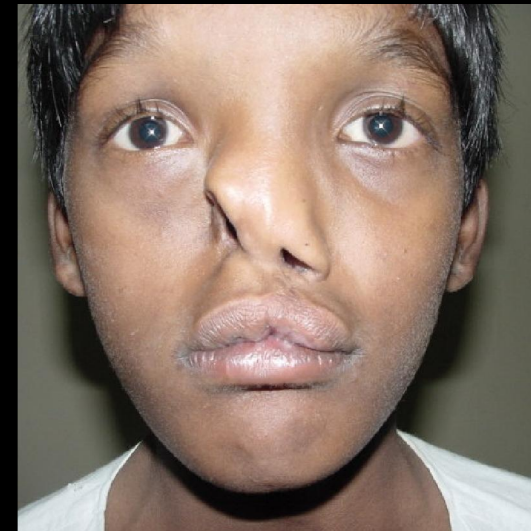
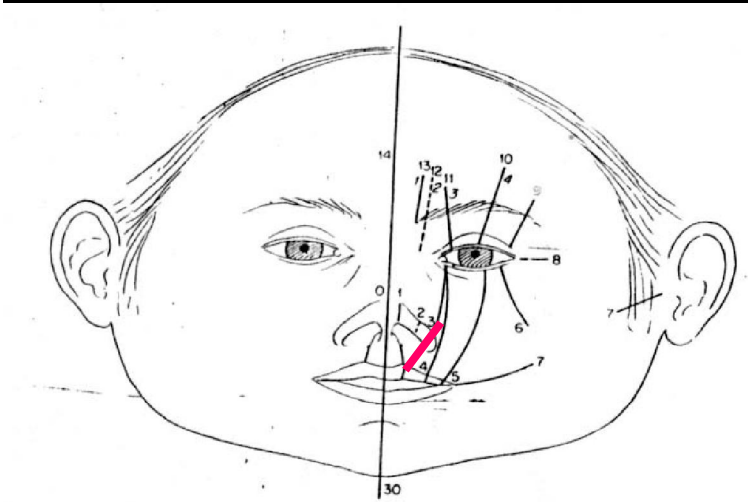


Tessier # 2 facial cleft



Craniofacial Clefts

Soft Tissue Defects

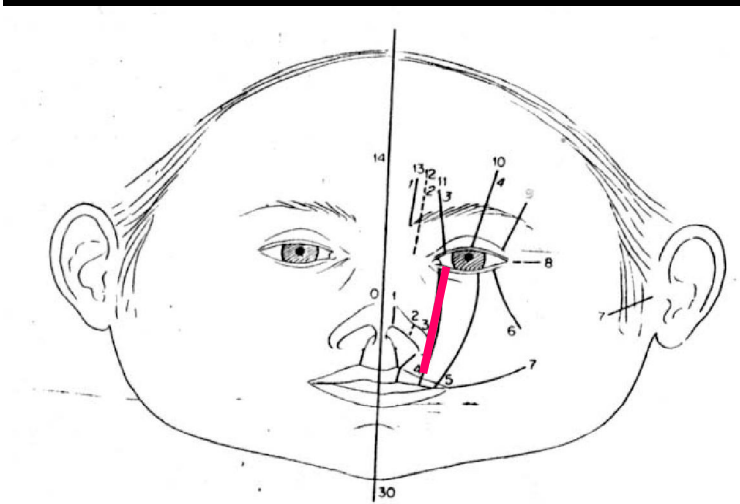


Tessier # 3 facial cleft



Craniofacial Clefts

Soft Tissue Defects



Unilateral Tessier #4 facial cleft

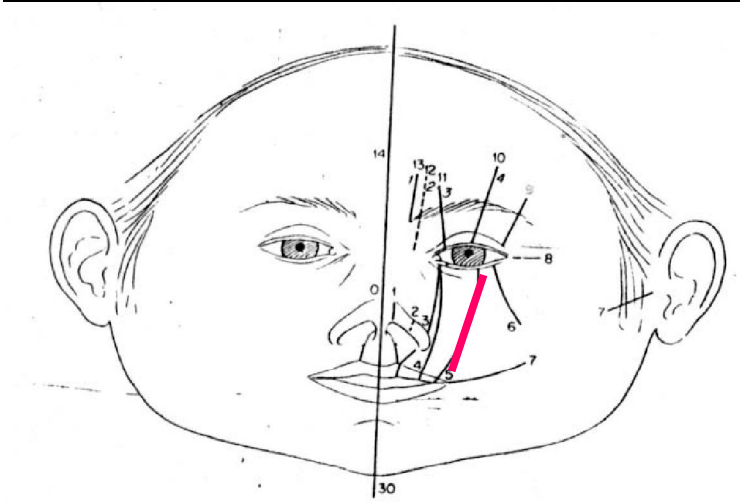


Bilateral Tessier #4 facial cleft



Craniofacial Clefts

Soft Tissue Defects

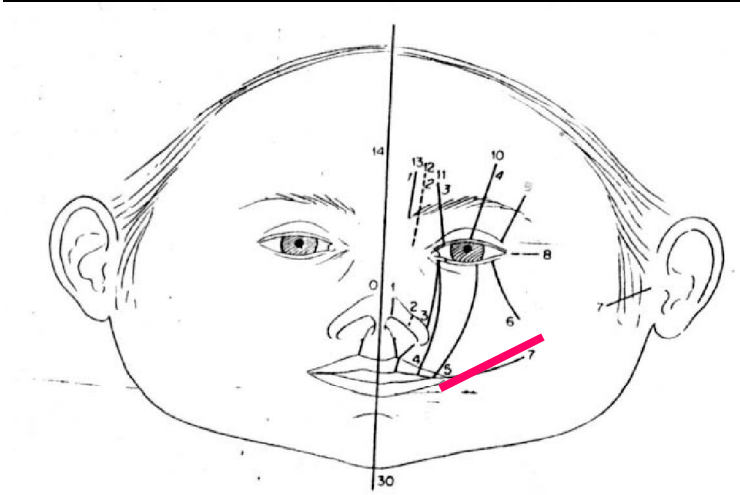


Tessier #5 facial cleft



Craniofacial Clefts

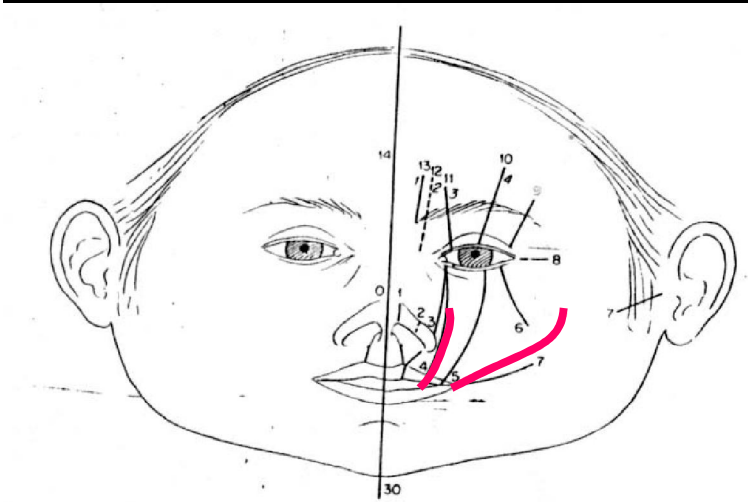
Soft Tissue Defects



Tessier #7 facial cleft



Craniofacial Clefts Soft Tissue Defects

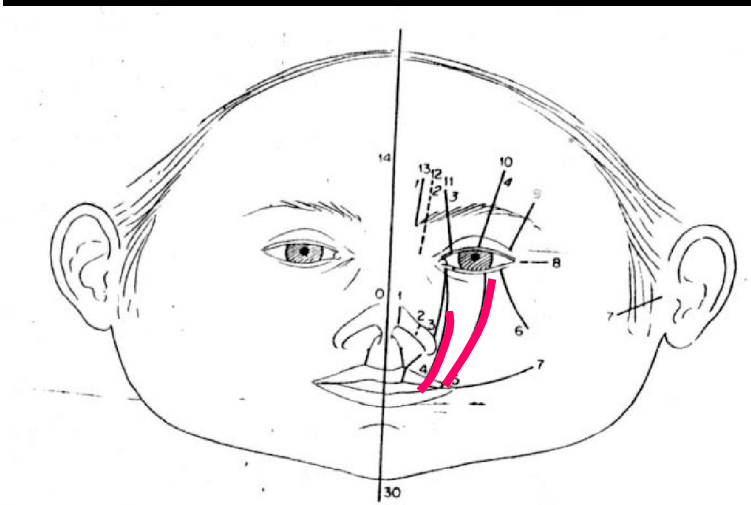


Tessier # 1, 4, 7 Facial Cleft



Craniofacial Clefts

Soft Tissue Defects

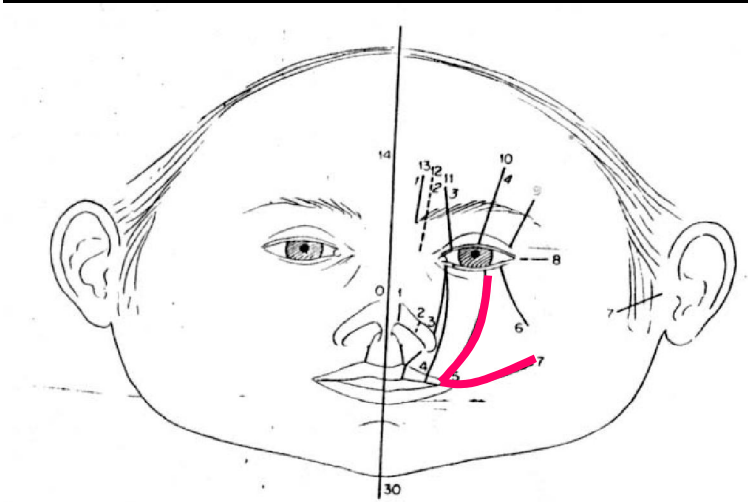


Tessier #4, #5 Facial Cleft



Craniofacial Clefts

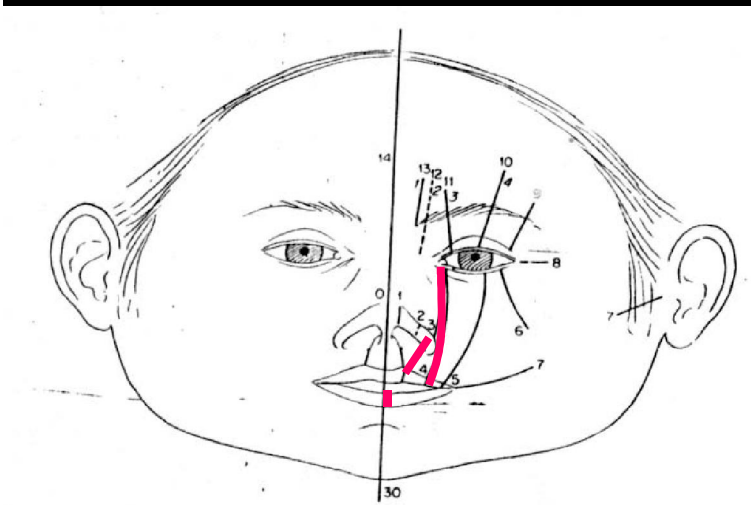
Soft Tissue Defects



Tessier #5, #7 facial cleft



Craniofacial Clefts Soft Tissue Defects



Bilateral Tessier # 3, # 4, # 30 Facial Cleft



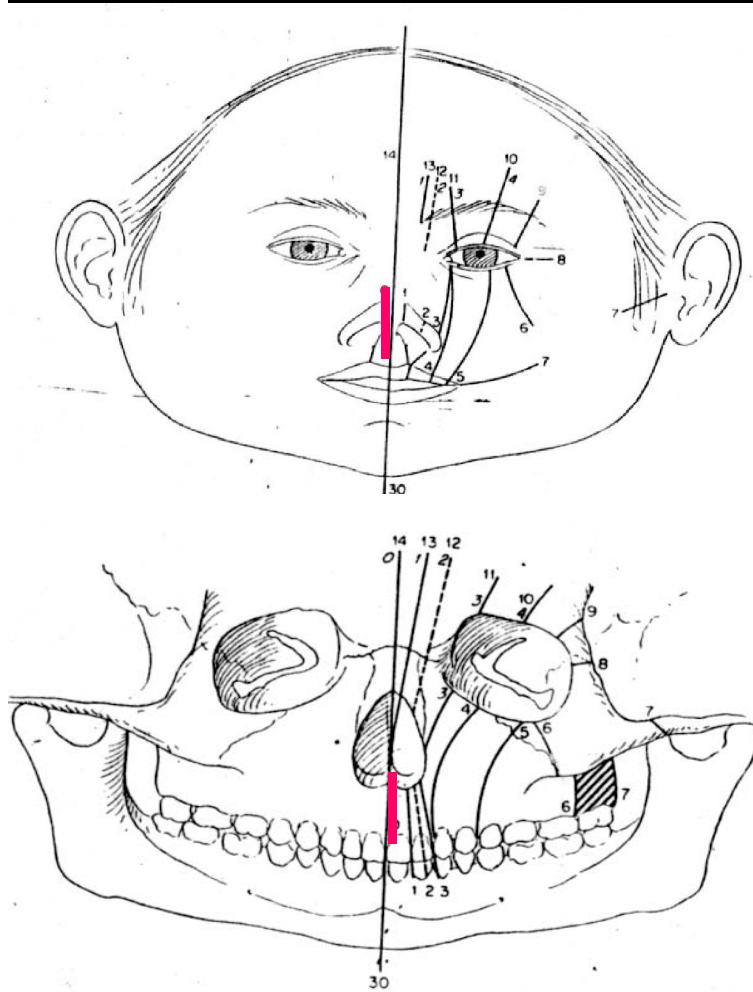
Craniofacial Clefts

Soft and Hard Tissue Defects



Craniofacial Clefts

Soft and Hard Tissue Defects

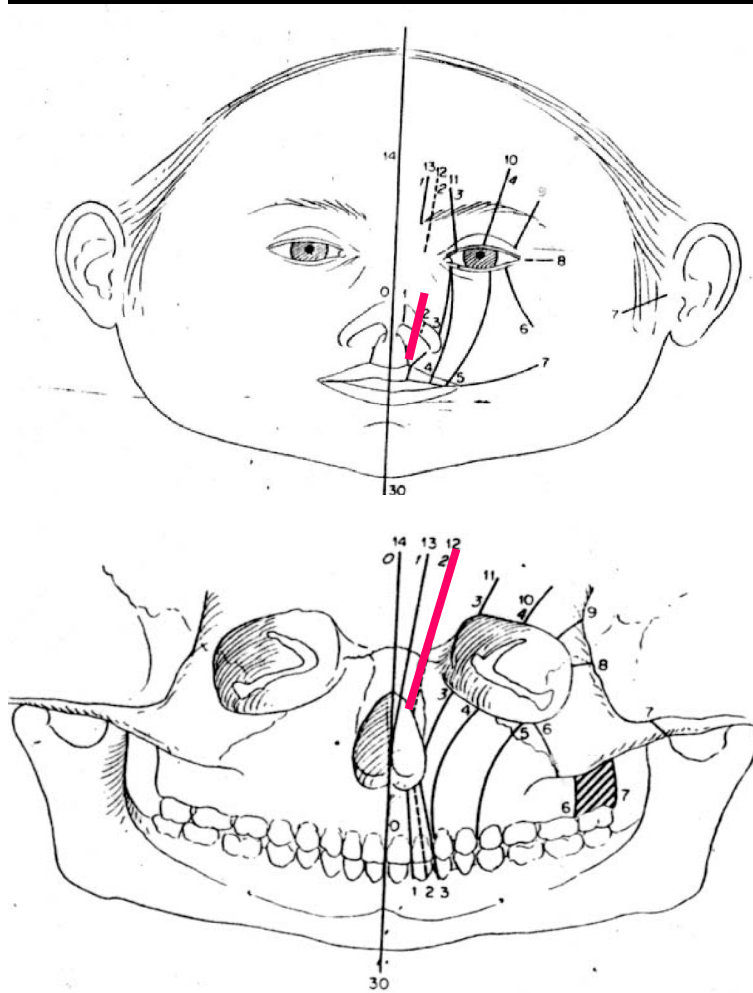


Tessier # 0 facial cleft



Craniofacial Clefts

Soft and Hard Tissue Defects

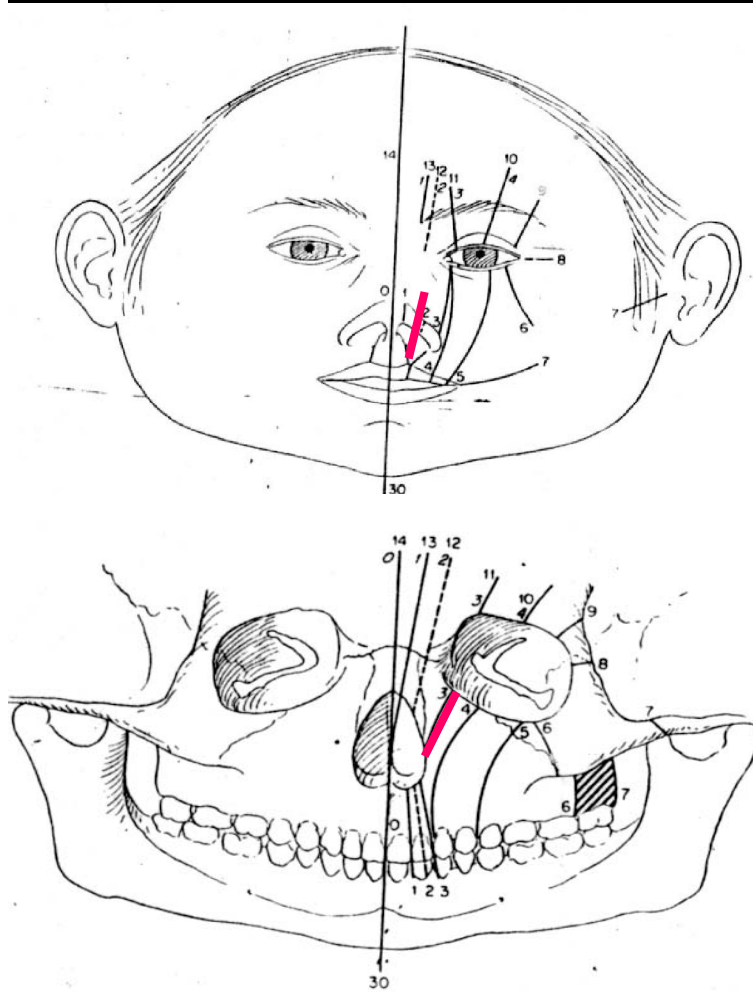


Tessier # 2 facial cleft



Craniofacial Clefts

Soft and Hard Tissue Defects

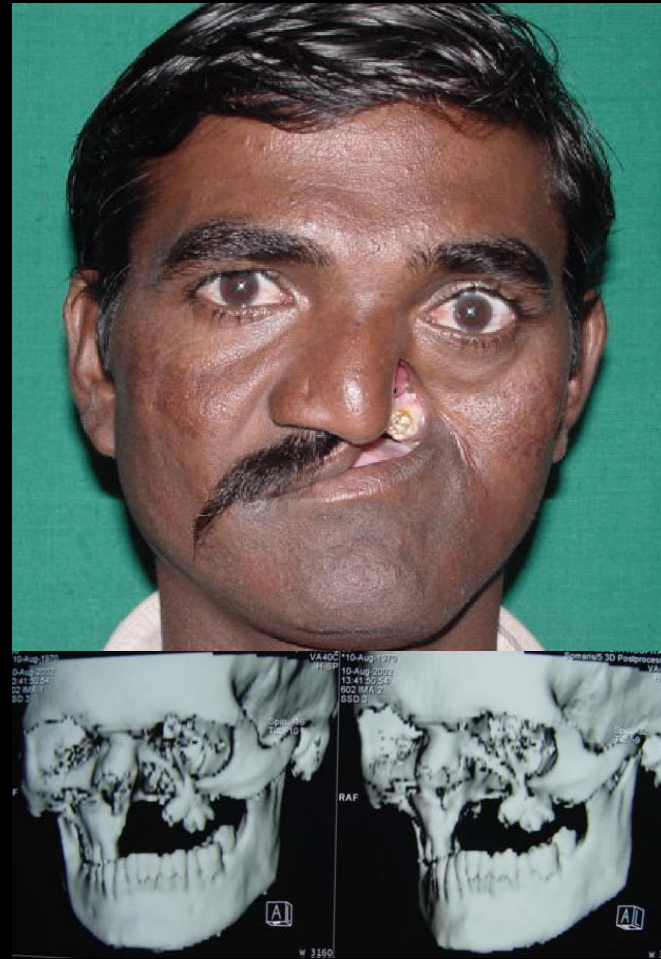
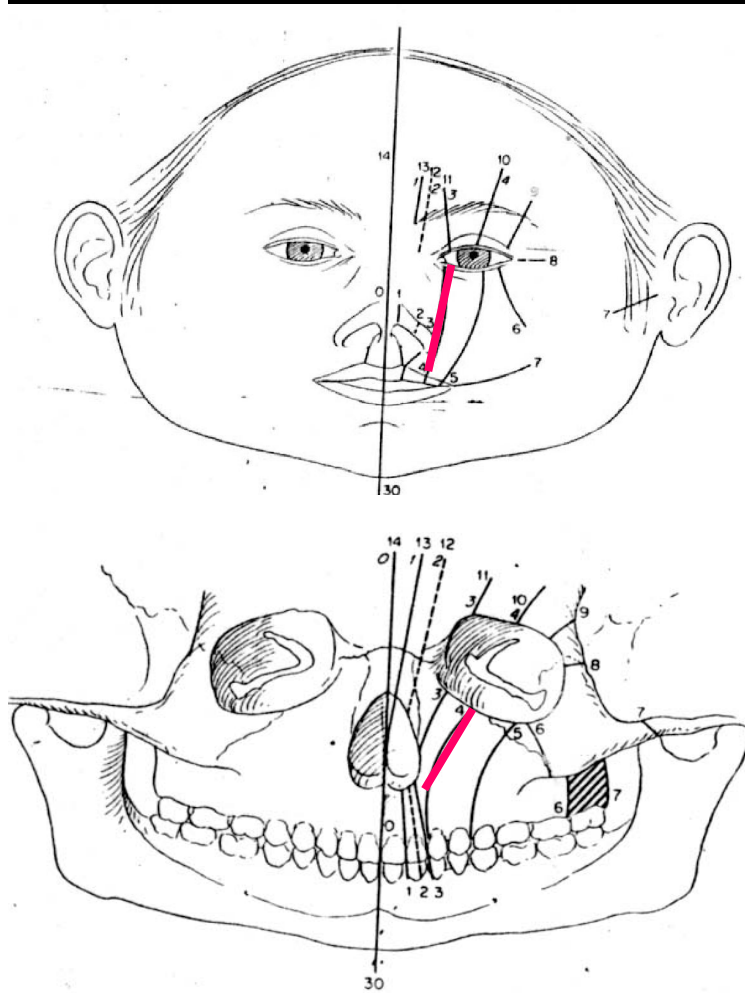


Tessier # 3 facial cleft



Craniofacial Clefts

Soft and Hard Tissue Defects

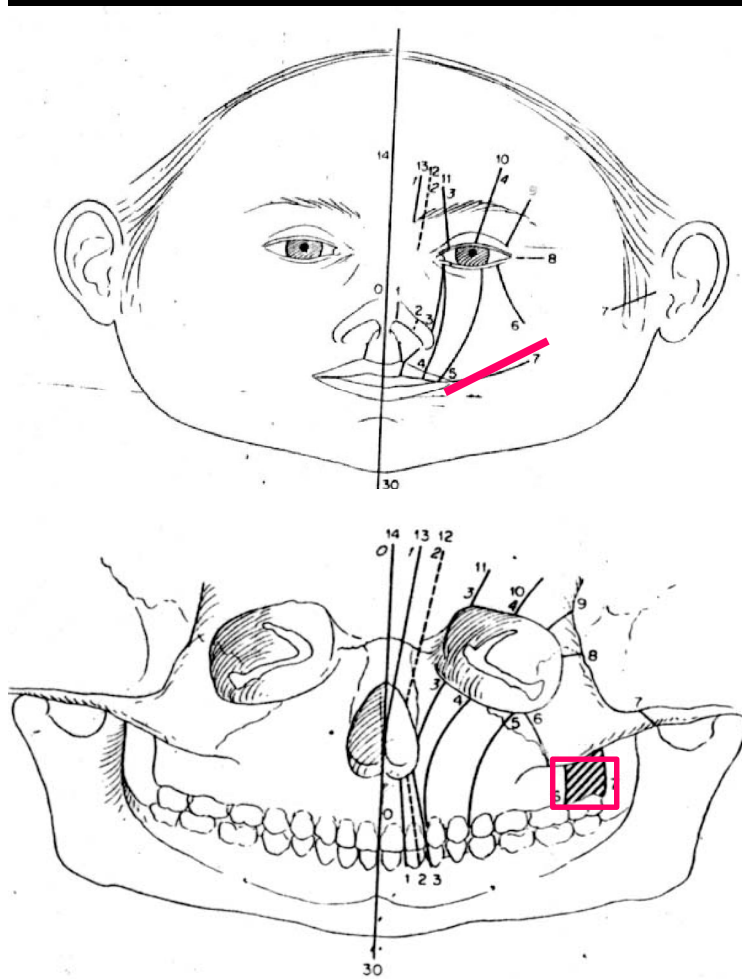


Unilateral Tessier #4 facial cleft



Craniofacial Clefts

Soft and Hard Tissue Defects

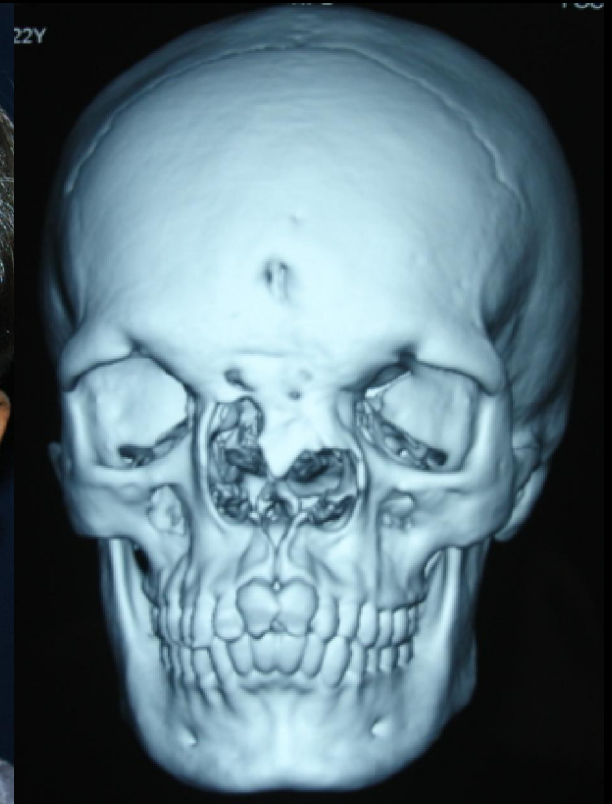
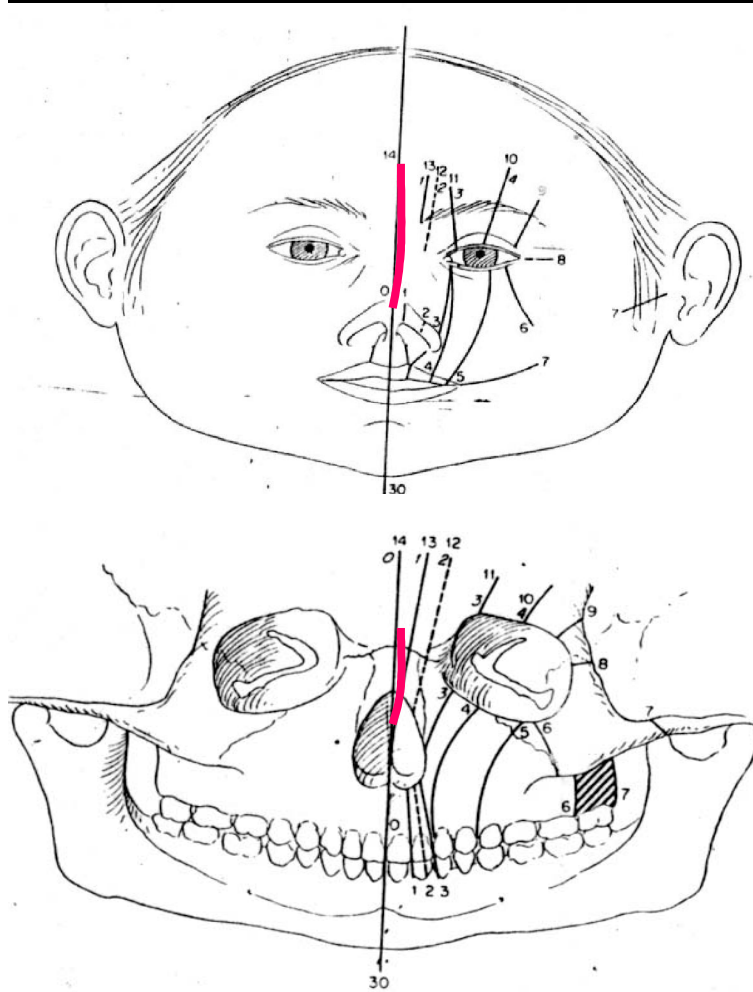


Tessier #7 facial cleft



Craniofacial Clefts

Soft and Hard Tissue Defects

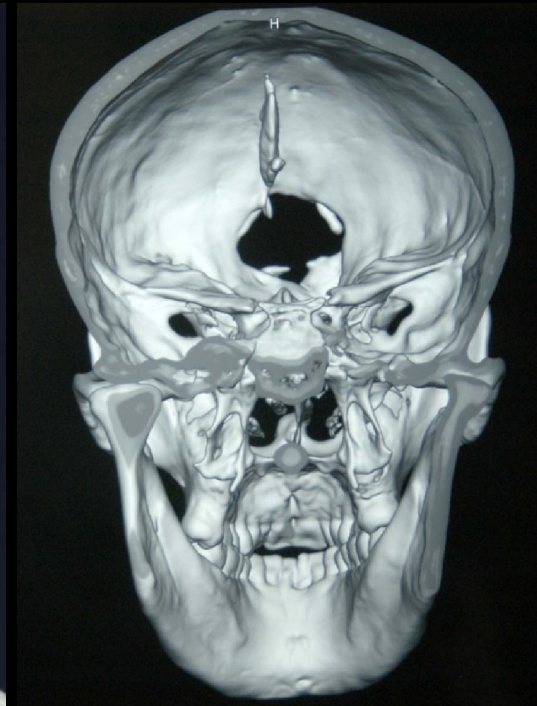
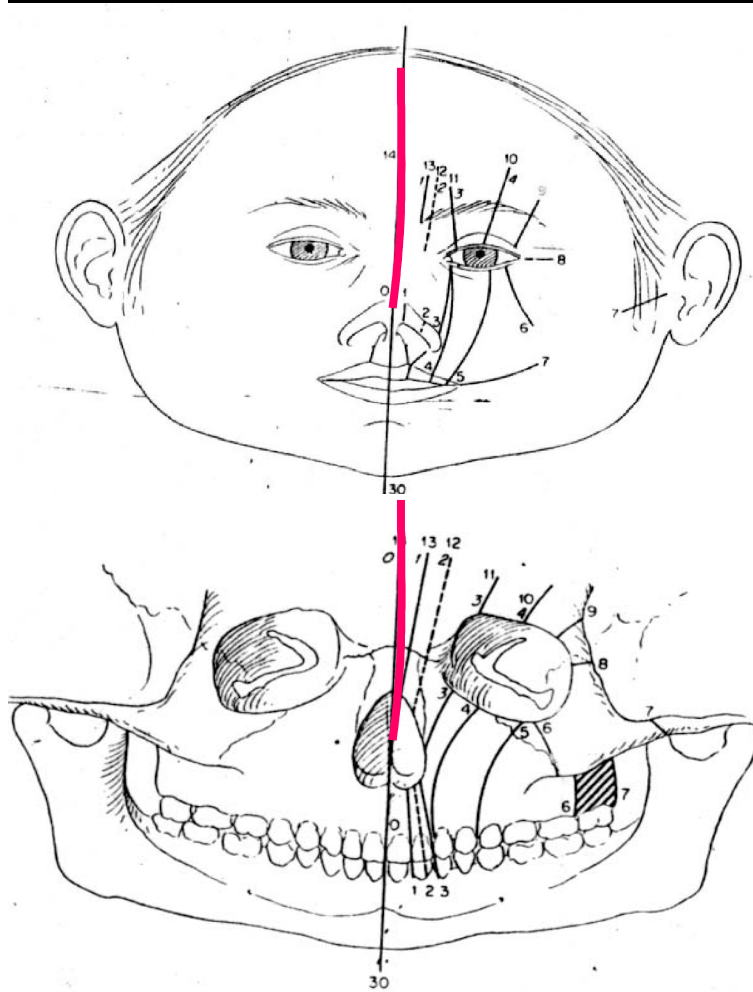


Tessier # 0-14 Facial Cleft with Orbital Hypertelorism



Craniofacial Clefts

Soft and Hard Tissue Defects



Tessier # 14 Facial Cleft with frontal
Encephalocele



MANAGEMENT OF CRANIOFACIAL CLEFTS



www.craniofacialinstitute.org

Principles of craniofacial cleft management

1. Soft tissue

2. Hard tissue



PRINCIPLES OF MANAGEMENT

Soft Tissue Management

Lip Vermilion notch
 Philtral Height
 Collumellar Height

Nose Symmetrical Ala
 Projecting Nasal Tip
 Naso Labial Folds

Eye Medial Canthal Ligament
 Repositioning of Tarsal plates
 Repositioning of the Lacrimal puncta
 Excision and removal of the colobomas of eyes
 Recreation of sufficient conjunctiva



Principles of craniofacial facial cleft management

Hard Tissue Management

Bone grafting and other hard tissue surgery like

Resection of encephaloceles

Hypertelorism correction

Orthognathic Surgery/Distractive Surgery



Principles of facial cleft management

SOFT TISSUE MANAGEMENT



Craniofacial Cleft Repair

Flap Design

Local rotational flaps



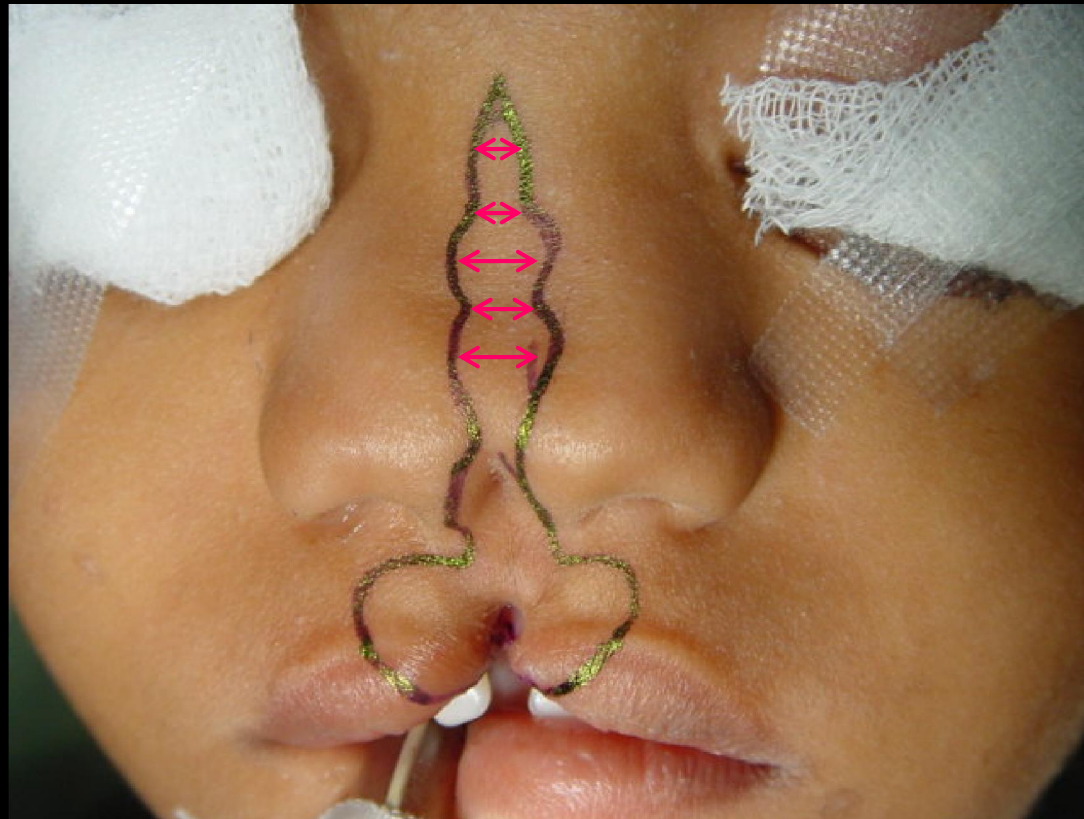
Z-plasty



Craniofacial Cleft Repair

Flap Design

Pfeifer wave design



Craniofacial Cleft Repair

Flap Design

Nasolabial Transposition Flap



Nasal Dorsum Rotational Flap



Forehead-Eyelid-Nasal Transposition Flap



Designed in collaboration with
Joachim Obwegeser



Craniofacial Cleft Repair

Tessier # 0-14 Facial Cleft



Craniofacial Cleft Repair

Tessier # 2 Facial Cleft



Craniofacial Cleft Repair

Tessier #3 Facial Cleft



Craniofacial Cleft Repair

Tessier #3 Facial Cleft



Craniofacial Cleft Repair



Bilateral Tessier # 4 Facial Cleft



Craniofacial Cleft Repair



Bilateral Tessier # 4 Facial Cleft



Craniofacial Cleft Repair



Tessier # 2, 3, 7 Facial Cleft



www.craniofacialinstitute.org

Craniofacial Cleft Repair



Tessier # 3, 4, 5 Facial Cleft



www.craniofacialinstitute.org

Craniofacial Clefts
SOFT AND HARD TISSUE
REPAIR/RECONSTRUCTION



www.craniofacialinstitute.org

Treatment

Principles of Treatment

- **The first principle** is to combine as many small procedures as is safe and practical into one operation to maximize the benefits of surgery early on the patient.
- **The second principle** is to decrease infection rates by limiting combined intraoral and intracranial procedures.
- **The third principle** is to decrease the number of revisionary and redo procedures.
- **The fourth principle** is to maximize the overall long-term functional and aesthetic results.

A full intracranial correction of orbital hypertelorism is difficult in children younger than 2 years old and almost impossible in those younger than 12 months old.



Treatment

Craniofacial Facial Clefts cause underlying hard tissue defects that usually manifest as **Hypertelorism**

Severe Hypertelorism

- Caused by encephalocele, facial clefting or in Apert's and Cruzon's syndrome.

Indications for intracranial approach

- The absolute indication for the intra cranial approach are an encephalocele and a cribriform plate lower than the level of the nasofrontal suture.



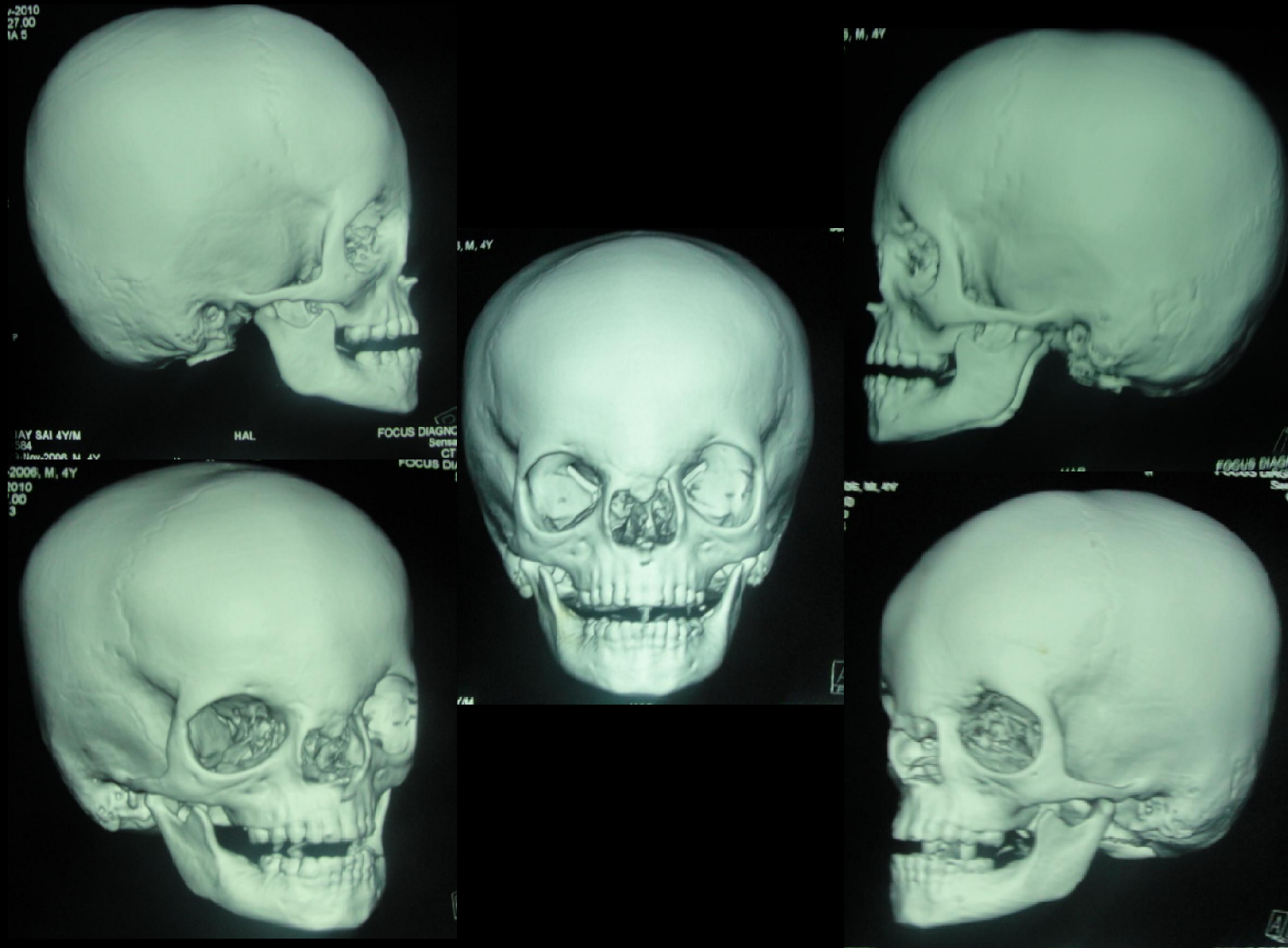
Treatment

Tessier #0-14 Craniofacial Cleft



Treatment

Tessier #0-14 Craniofacial Cleft



Treatment

Tessier #0-14 Craniofacial Cleft



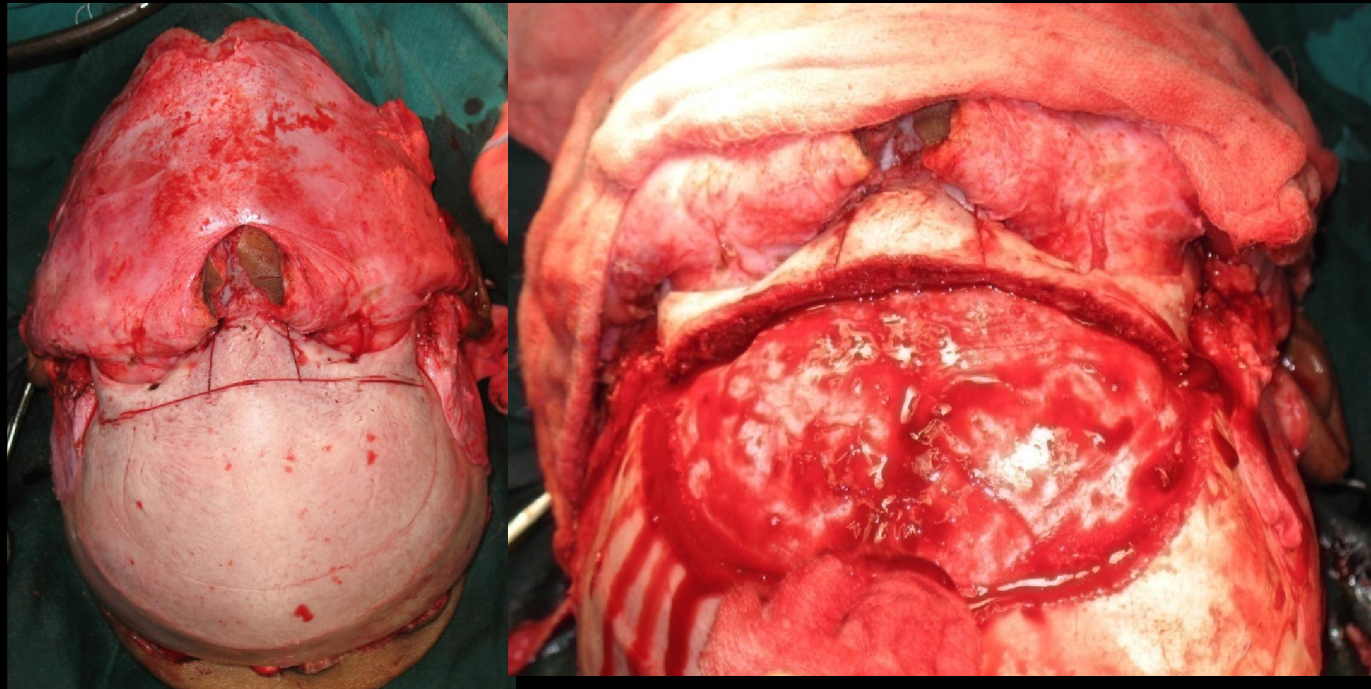
Skin Incision

The skin incision for the intracranial correction of orbital hypotelorism consists of bicoronal incision with the dissection as far forward and anterior as possible.



Treatment

Tessier #0-14 Craniofacial Cleft



Transfrontal Craniotomy

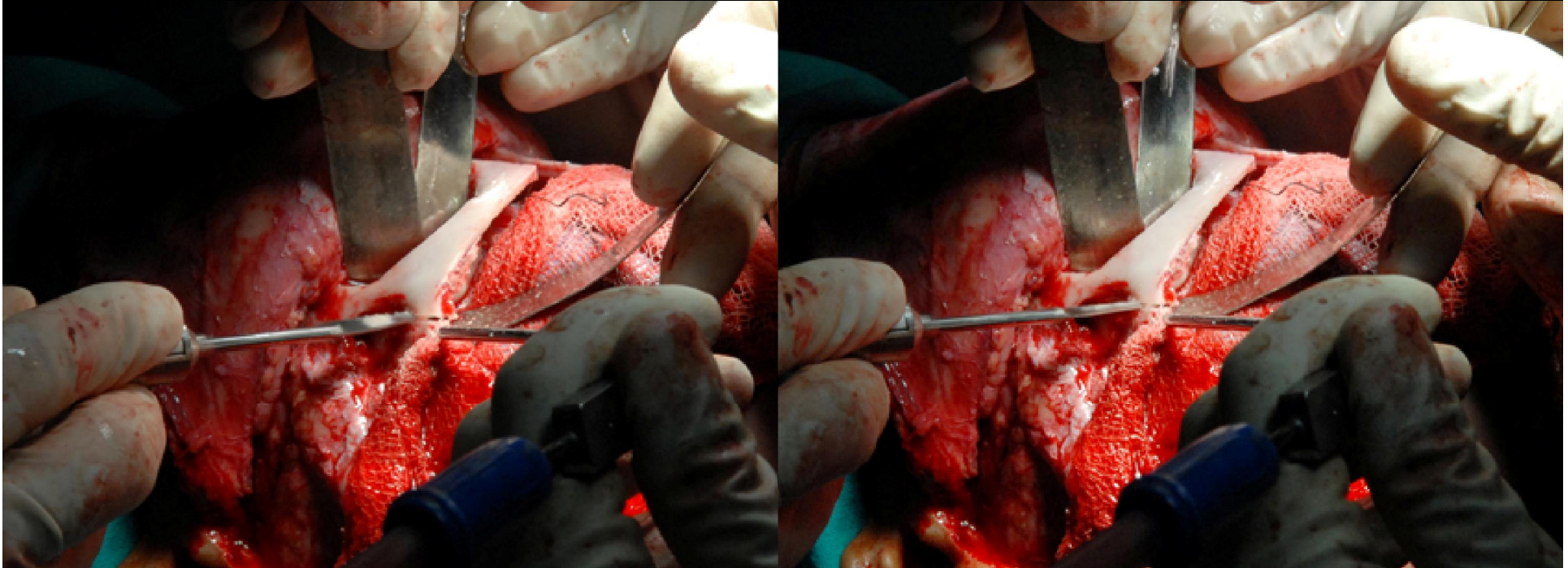
This includes a transfrontal craniotomy with an intervening frontal bar, which is left intact.

The frontal bar results from parallel osteotomies that are at least 1 cm from the supraorbital rims and permits orientation of the orbits once they have been mobilized



Treatment

Tessier #0-14 Craniofacial Cleft



Periorbital Osteotomy

A periorbital osteotomy is completed initially extracranially, going parasagittally through the frontozygomatic region, the finally intracranially.

Lateral Orbital Wall Osteotomy



Treatment

Tessier #0-14 Craniofacial Cleft



Orbital roof osteotomy

The bony cuts of the orbital roofs are performed with intracranial visualization

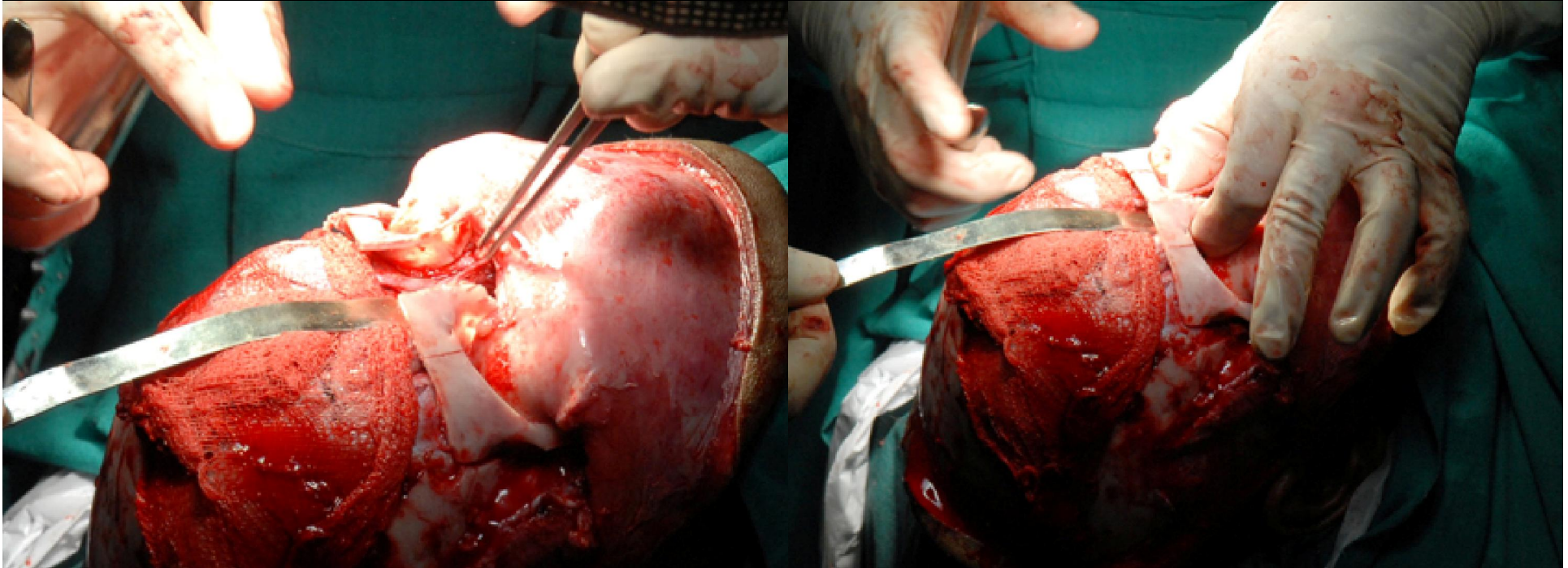
Orbital approximation

A central block of bone is removed between the orbits to allow their approximation in a medial direction.



Treatment

Tessier #0-14 Craniofacial Cleft



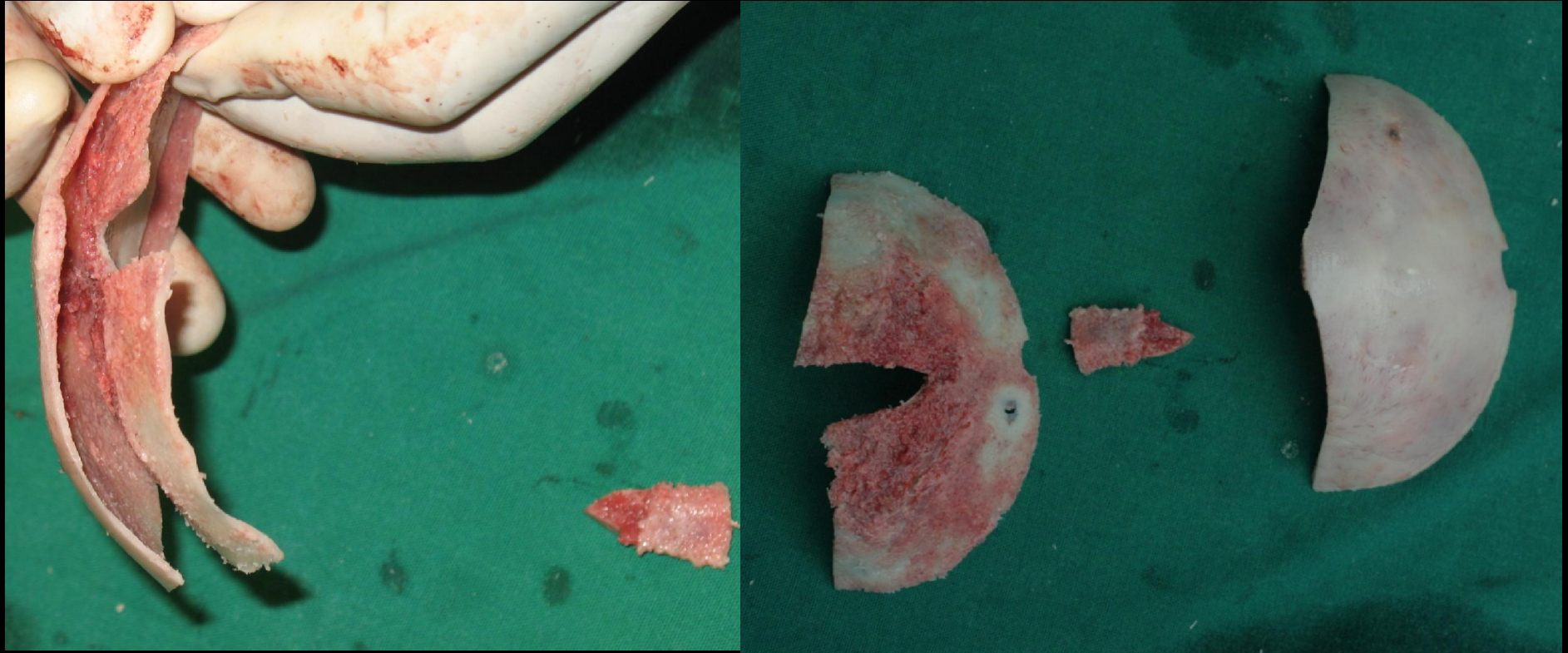
Finishing osteotomy

Finally, a wedge of bone is removed from either side of piriform fossa so that the nasal airways are not constricted when the orbits are moved medially. If the osteotomies have been performed to their full depth, the orbits can be approximated by finger pressure alone



Treatment

Tessier #0-14 Craniofacial Cleft



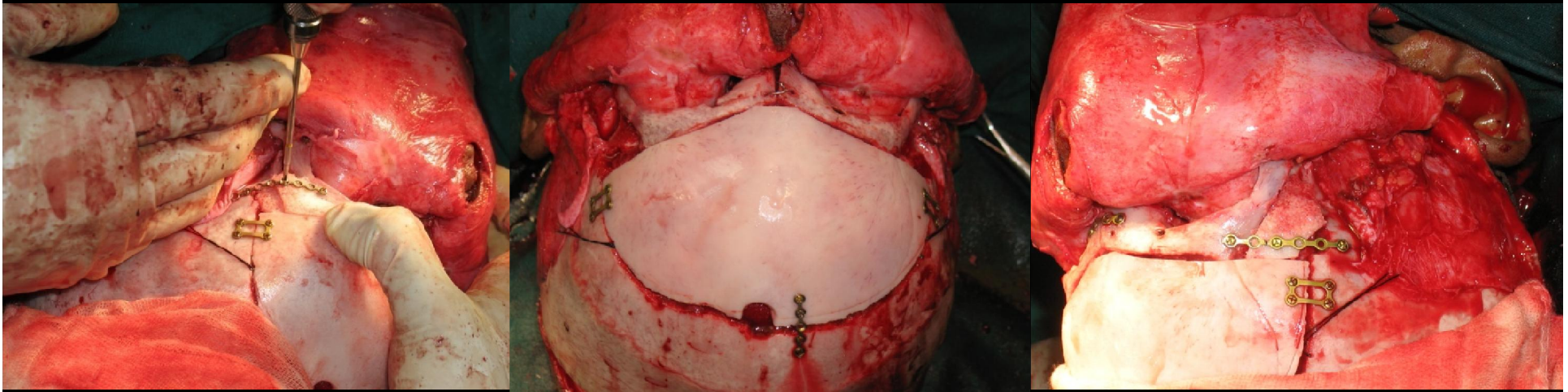
Fixation and bone grafting

Bone graft material harvested from the calvarium can be split into into the two cortices and one cortex can be used to graft bone in the defects and the other can be used to close the original defect



Treatment

Tessier #0-14 Craniofacial Cleft



Fixation and bone grafting

The orbits are positioned and held in place with wires or micro-or miniplates.

Bone graft material harvested from the clavarium, iliac crest, or rib is then used to fill in the resulting gap defects at the lateral orbital walls and zygomatic areas



Treatment

Tessier #0-14 Craniofacial Cleft



Treatment

Tessier #0-14 Craniofacial Cleft



Treatment

Tessier #0-14 Craniofacial Cleft



Treatment

Tessier #0-14 Craniofacial Cleft



Treatment

Tessier #0-14 Craniofacial Cleft

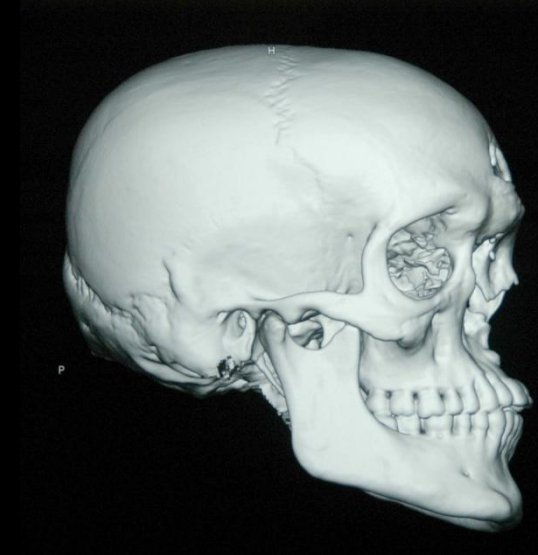
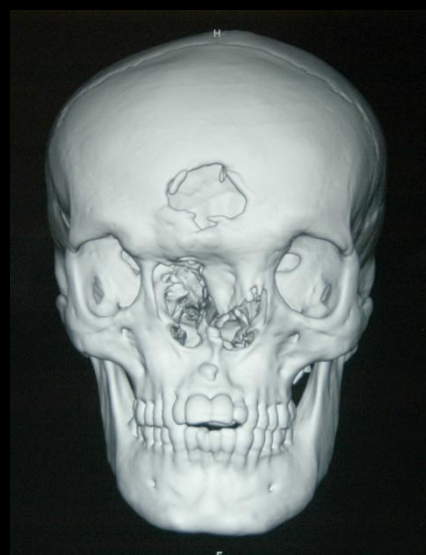
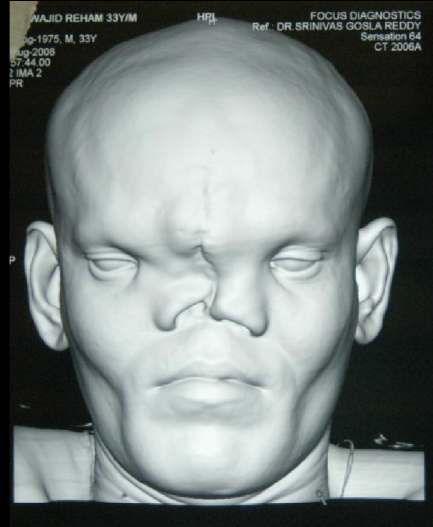


Treatment

Tessier #14 Craniofacial Cleft

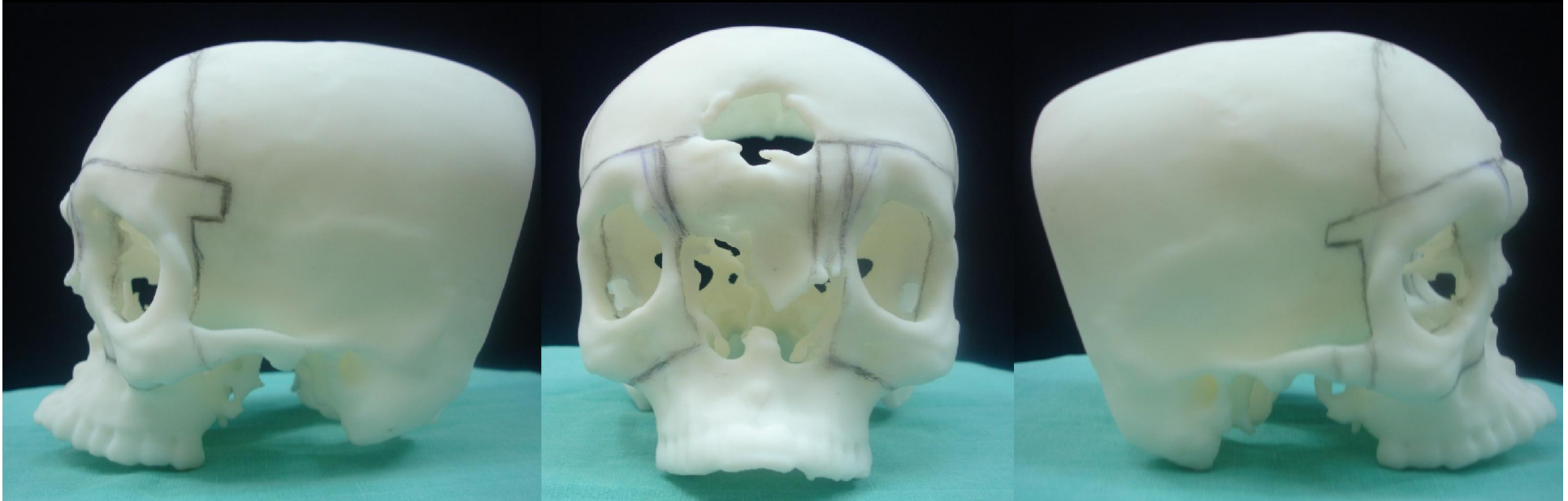


Treatment CT Scan



Treatment

Stereo Lithographic Models



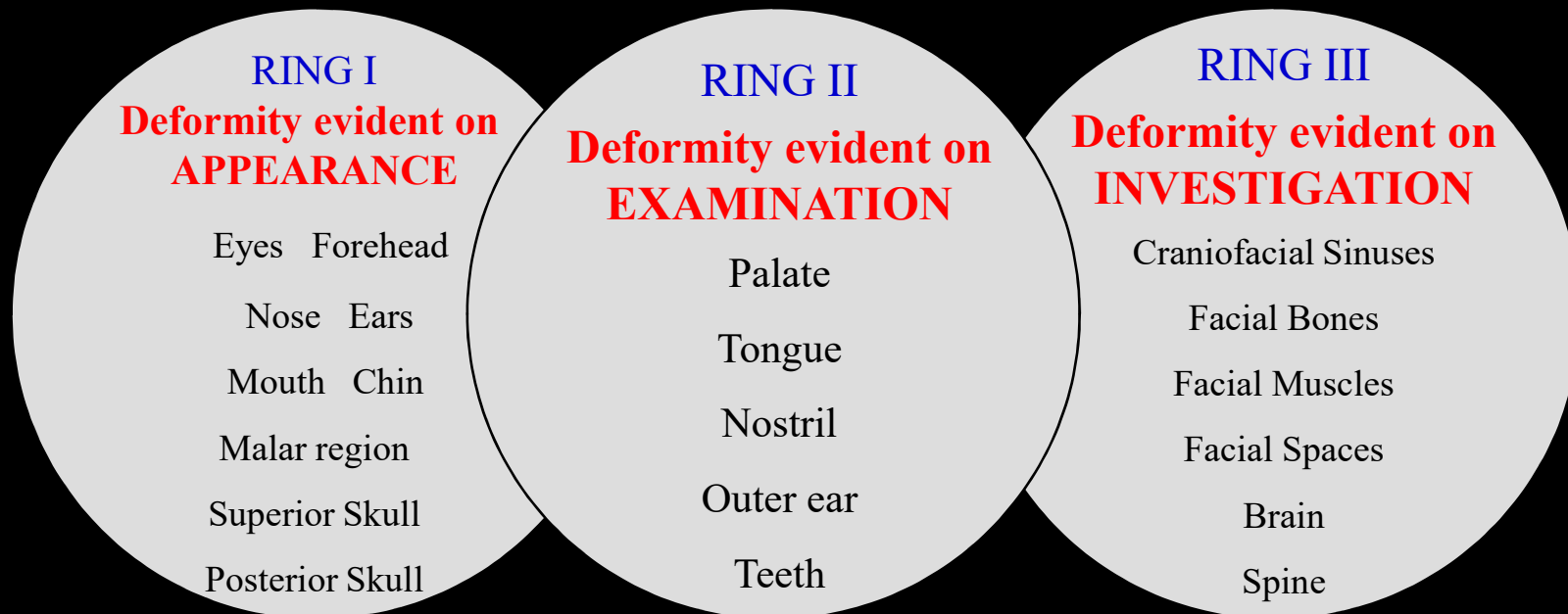
Treatment

Tessier #14 Craniofacial Cleft



My Message

- Craniofacial cleft repair is not a complex surgery
- Diagnosis of the defect should always be made with respect to the morphology of the defect
- Identify the defect in **Morphological Sub Units**
- Correct each sub unit collectively or independently



Bring the Smile Back



Thank You

 niofacialinstitute.org