

MANAGEMENT OF FACIAL ASYMMETRY

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Questionnaire

Essay

- Management of Facial Asymmetry

Long Questions

- Hemifacial Microsomia
- Management of TMJ Sequelae



CONTENTS :

1. Classification

2. Causes

3. Etiology

4. Management





ELSEVIER
SAUNDERS

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ORAL AND
MAXILLOFACIAL
SURGERY CLINICS
of North America

Management of Facial Asymmetry

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CLASSIFICATION OF FACIAL ASYMMETRIES

1. Skeletal asymmetries
2. Soft tissue asymmetries
3. Functional asymmetries



Causes :

- Craniosynostosis
- TMJ Sequelae
- Clefting conditions
- Hemifacial hyperplasia
- Hemifacial atrophy
- Hemifacial microsomia
- Condylar and hemimandibular hyperplasia
- Hamartomas
- Vascular malformations

Management of Facial Asymmetry

George K.B. Sandor, MD, DDS, PhD, Dr Habil, FRCDC, FRCSC, FACS

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ETIOLOGY

AJO PIRTTINIEMI 1994

- A. PRENATAL CAUSES

- GENETIC

- Facial clefting syndromes
 - unilateral CLCP - craniofacial clefts



- CONGENITAL

- Hemi facial microsomia
 - Neurofibromatosis
 - Birth trauma
 - Intra uterine pressure during preg.



- **B. Postnatal causes**

- ENVIRONMENTAL

- Trauma & infection
 - Muscle dysfunction
 - Functional deviations
 - TMJ derangements
 - Hemi mandibular hypertrophy
 - Pathologies



Asymmetry Treatment

Growing Children

Adults

Hybrid
Functional
Appliances

Distraction
Osteogenesis

Orthodontic
camouflage

Surgical
Osteotomy

Functional asymmetry

Occlusal
Calibration

Splints



General Surgical Management

Conditions with severe skeletal asymmetries cannot be corrected by orthodontic camouflage and growth modifications so surgical procedures are used to correct the deformities



Cause and Surgical corrections

- Maxillary hypoplasia: Le-forte 1

osteotomy

With max advancement.

- Maxillary hyperplasia:

maxillary segmental setback.

- Maxillary vertical excess:

leforte-1 osteotomy with maxillary impaction.



- **Mandibular hyperplasia:** 1)sagittal split osteotomy. 2)sub-sigmoid osteotomy.
- **Mandibular hypoplasia:**
 - 1) sagittal split osteotomy with mandibular advancement.



TREATMENT PLANNING FOR ASYMMETRIC - SKELETAL

LOWER 1/3

A, B

MIDDLE 1/3

A, B

UPPER1/3

A, C

A) Esthetic procedures

Augmentations

- Autogenous onlays
- Alloplastic onlays

Reductions

- Skeletal recontouring
- Osteotomies

B) Orthognathic surgery

C) Craniofacial surgery



SOFT TISSUE

LOWER 1/3

A, B

MIDDLE 1/3

A, B

UPPER1/3

A, C

A) Repositioning

- primary – Cleft lip and Palate
- secondary

B) Reduction

- Liposuction
- Myectomies

C) Augmentation

Autogenous grafts

- Free fat transfer
- Dermal fat grafts
- Collagen

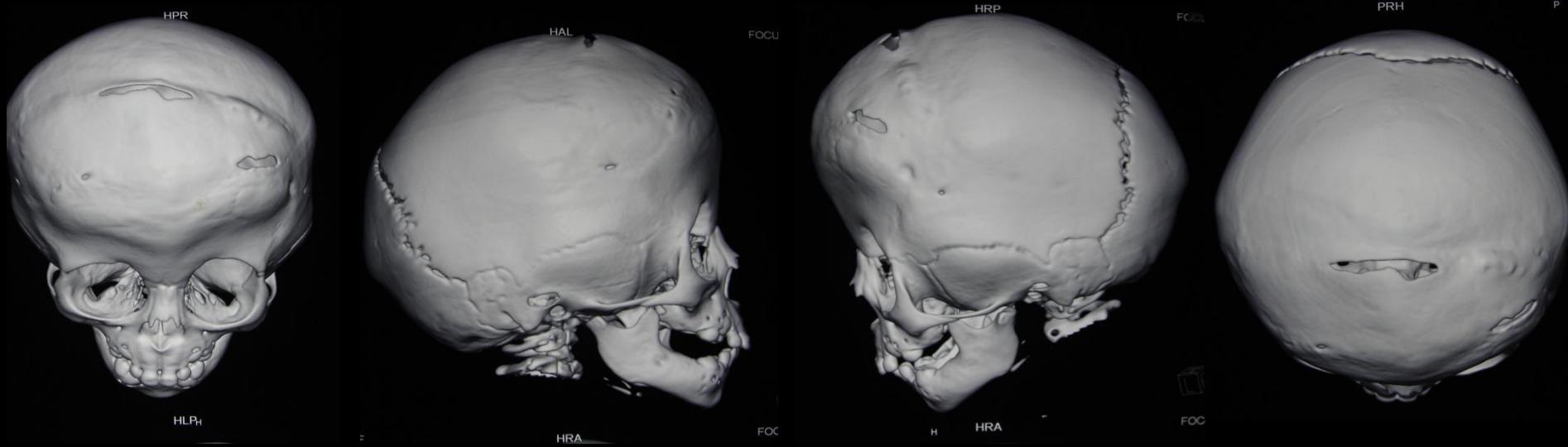


CRANIOSYNOSTOSIS



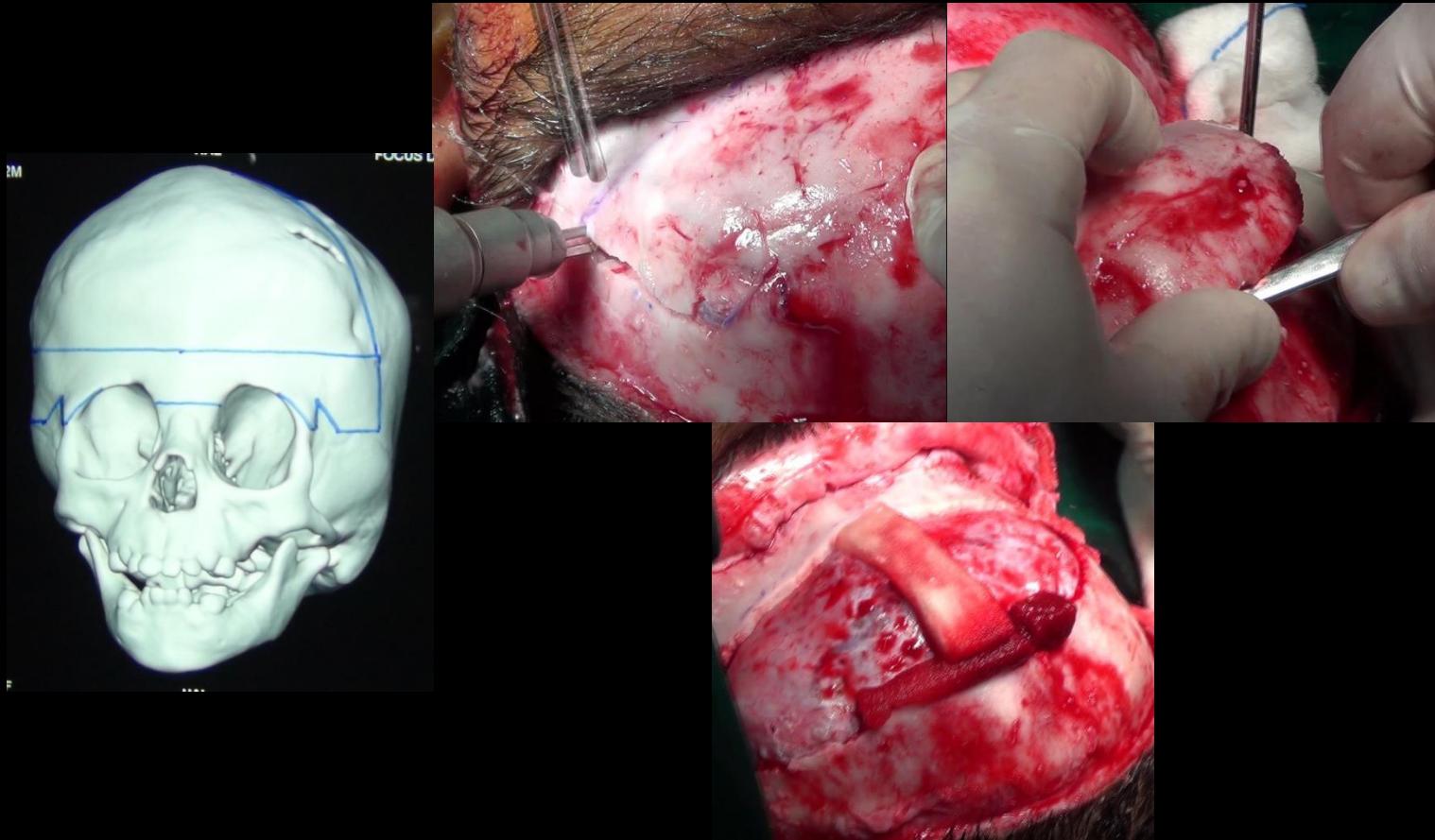
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Brachycephaly – Bilateral Coronal Stenosis



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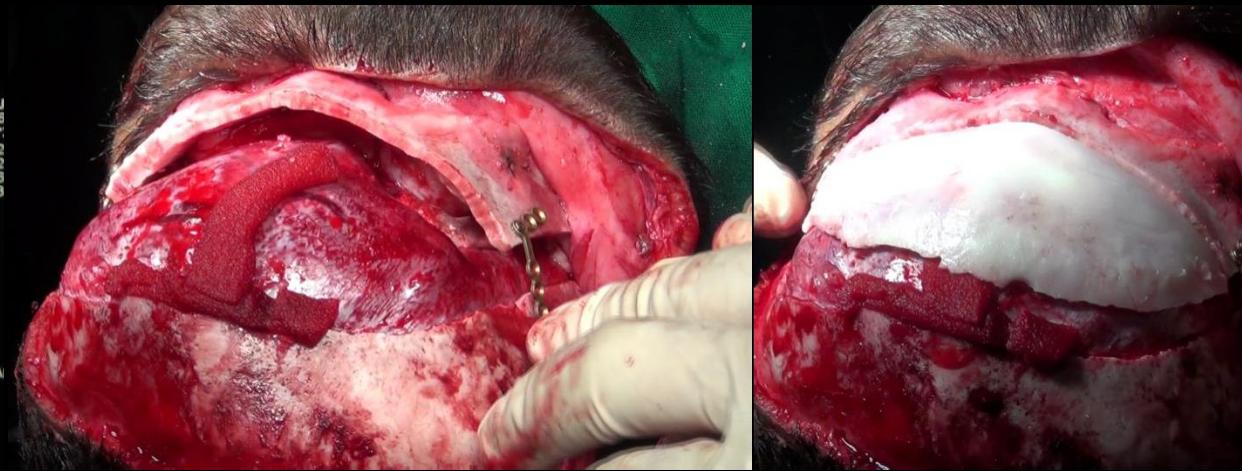
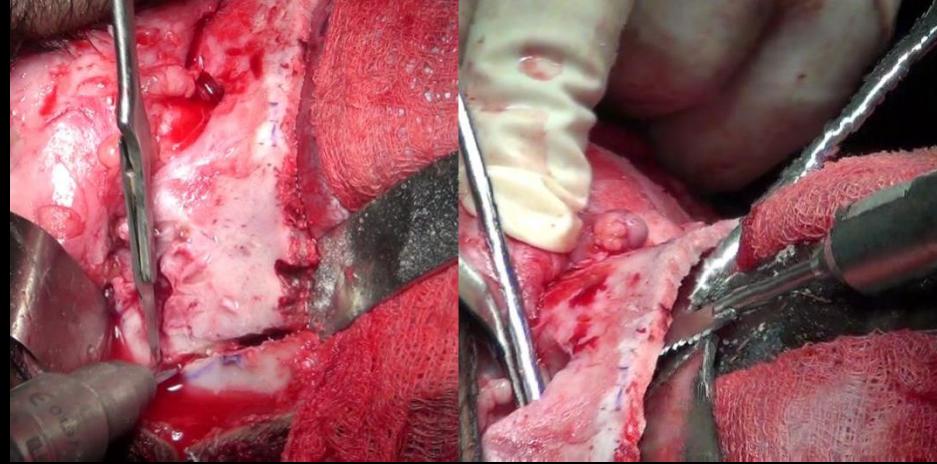
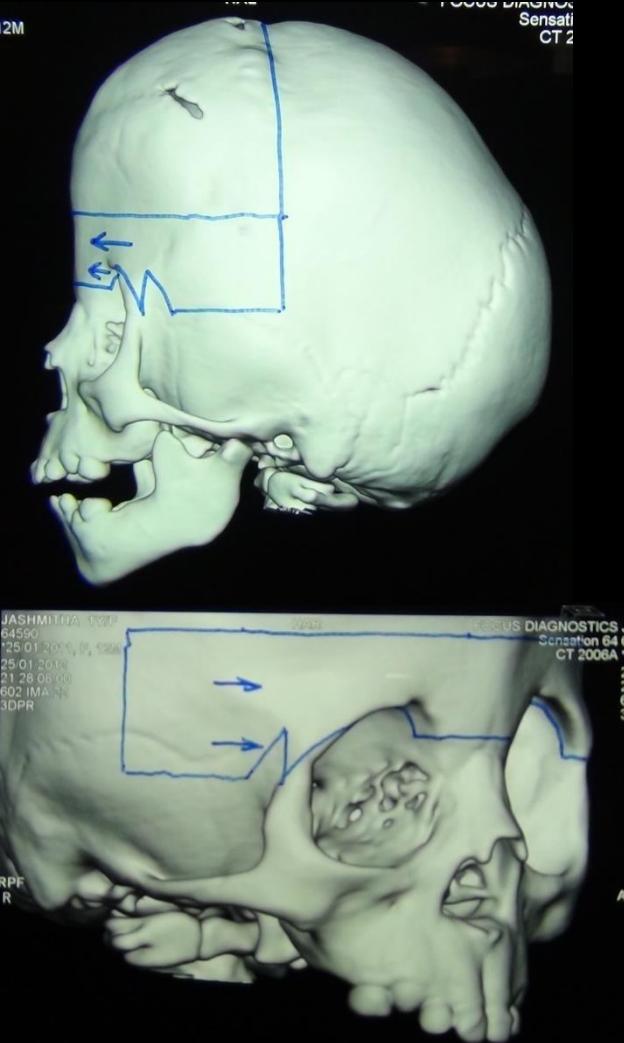
Craniosynostosis



Raising Frontal Flap



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Superior Orbital rim advancement and fixation

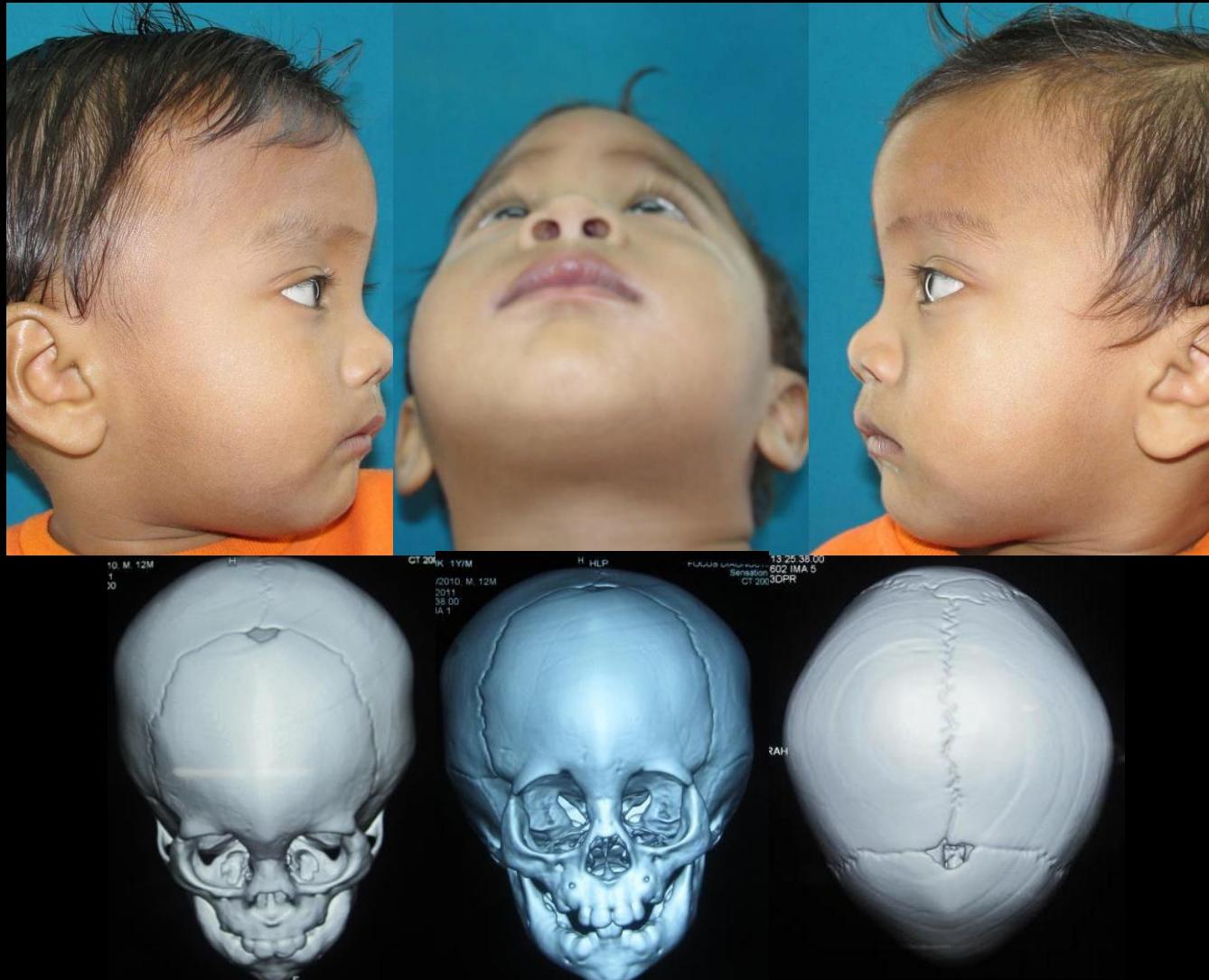


Pre Op Post Op

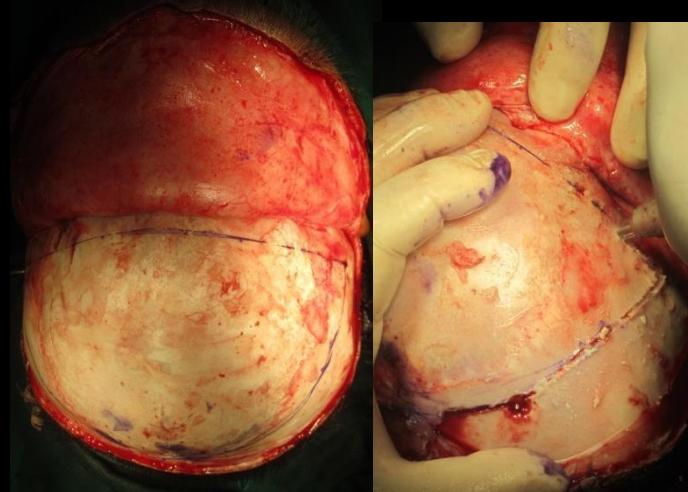


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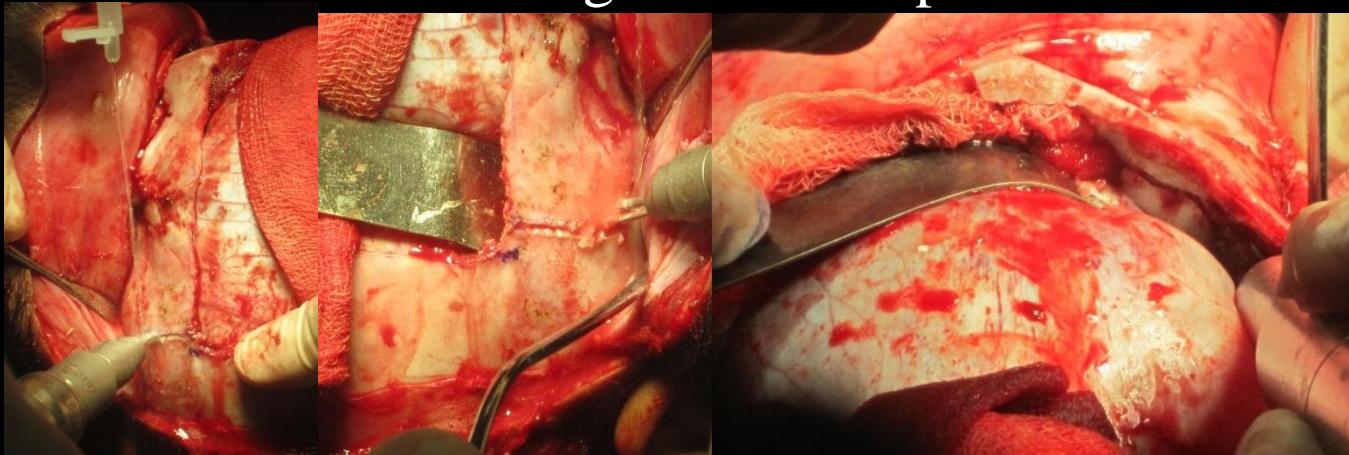
Trigonocephaly – Metopic suture Stenosis



Craniosynostosis



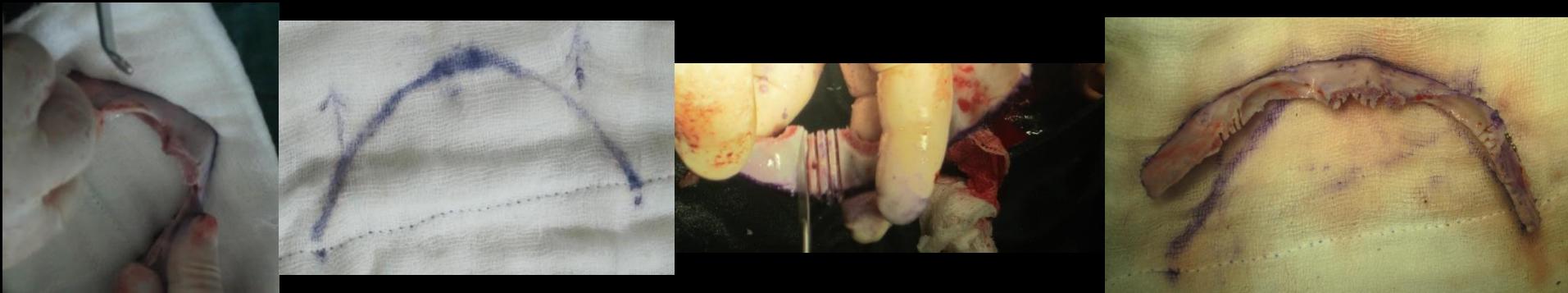
Raising Frontal Flap



Harvesting supraorbital band



Craniosynostosis



Superior Orbital rim advancement and fixation



Fixation



Pre Op

Post Op

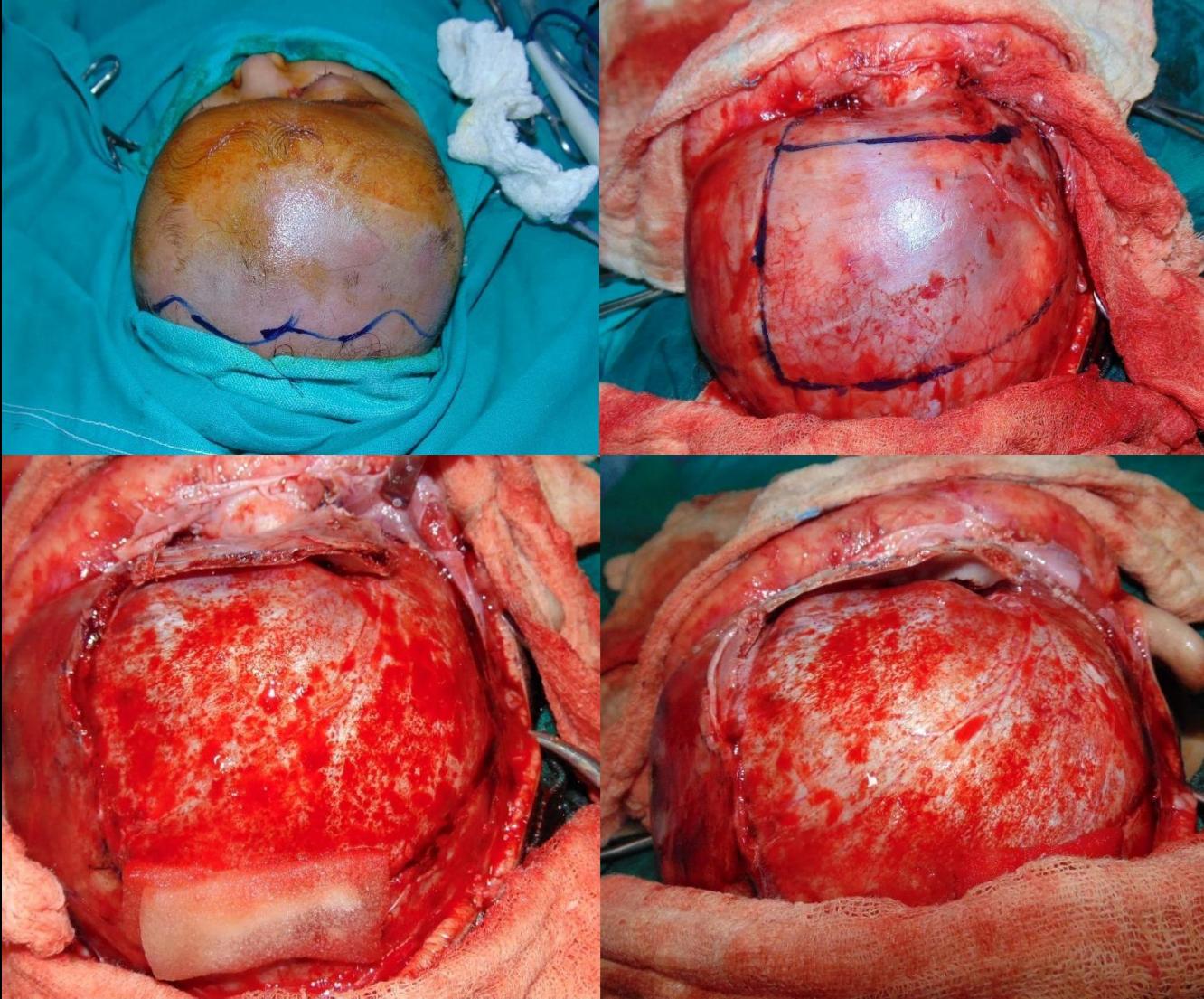


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Plagiocephaly - Unicoronal Stenosis



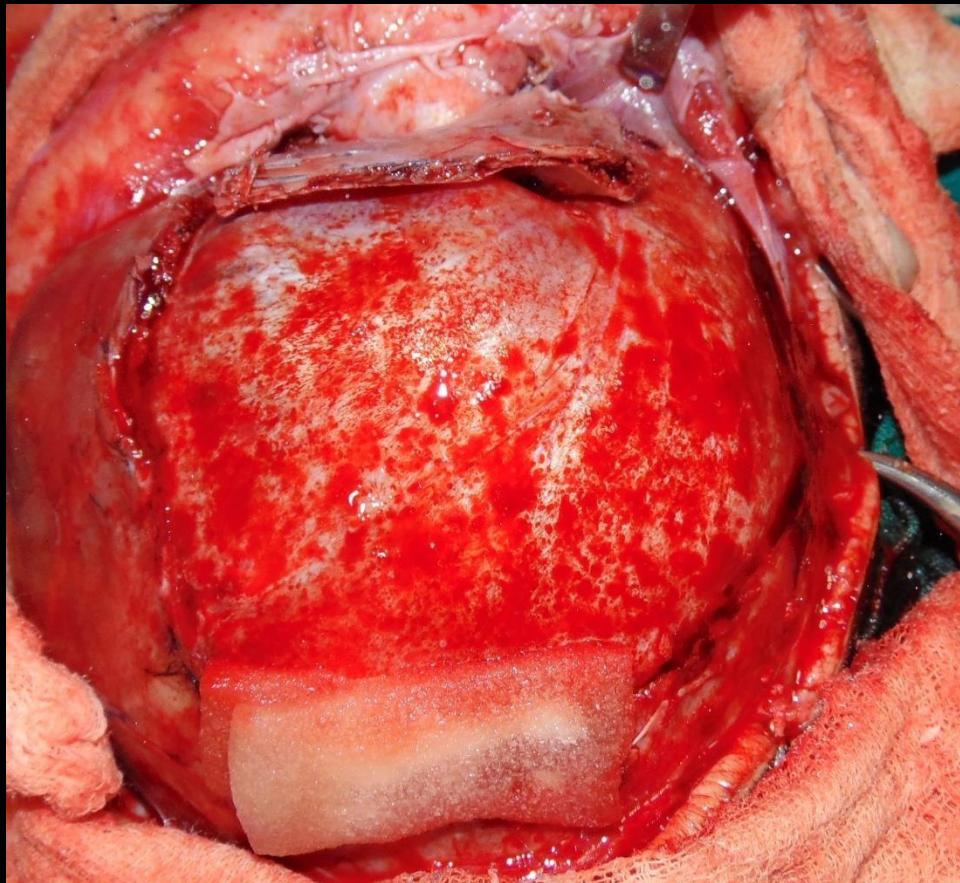
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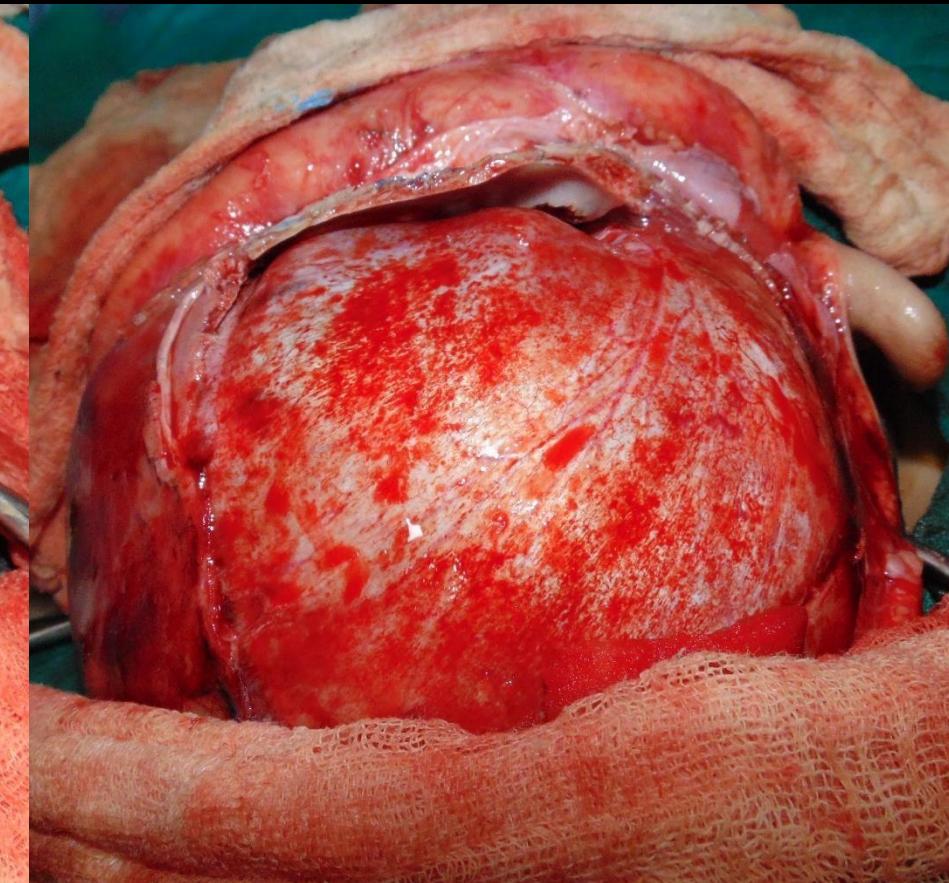
Raising Frontal Flap



Before Advancement



After Advancement



Pre Op



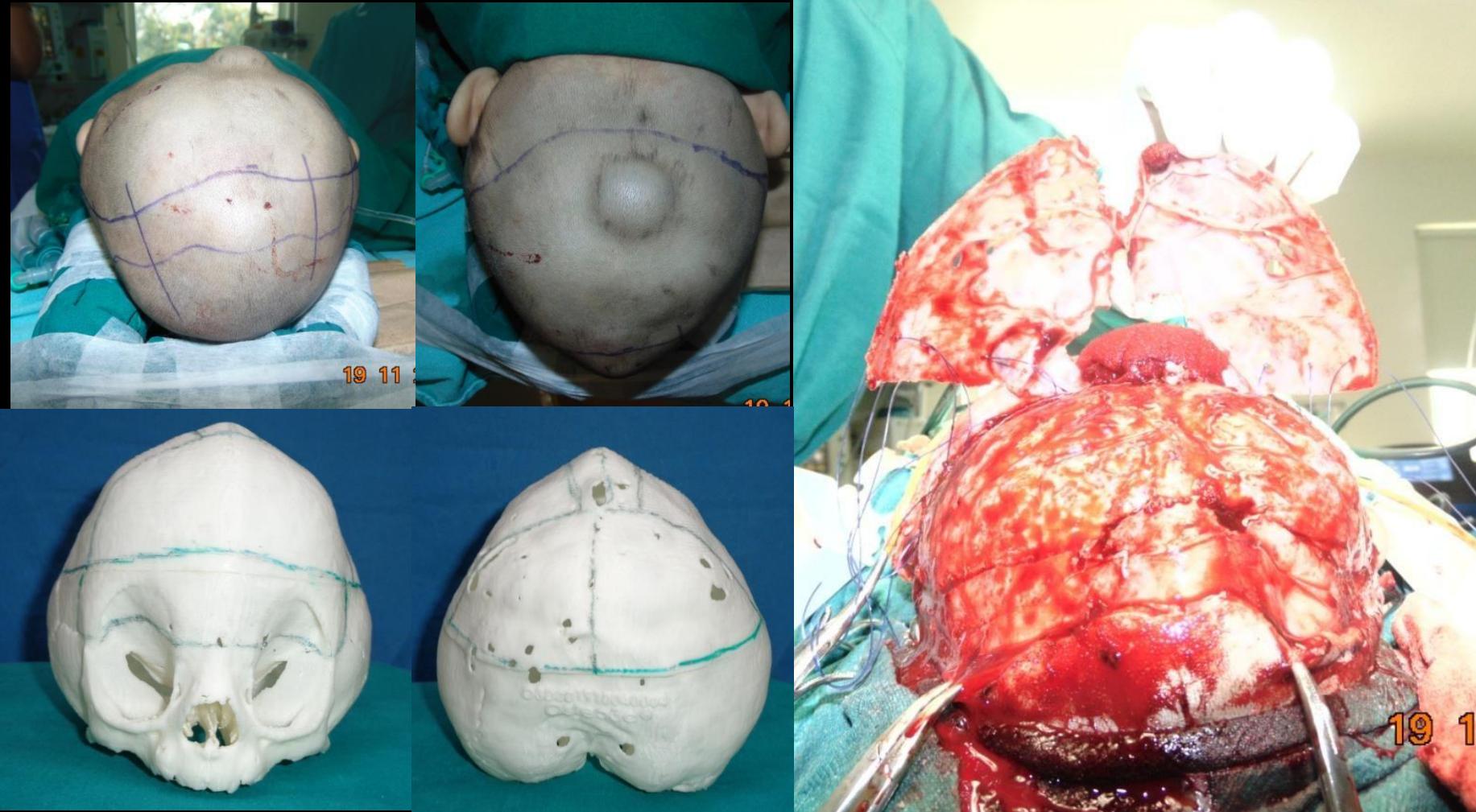
Post Op



Turricephaly – Sagittal,Coronal,Lambdoid Stenosis



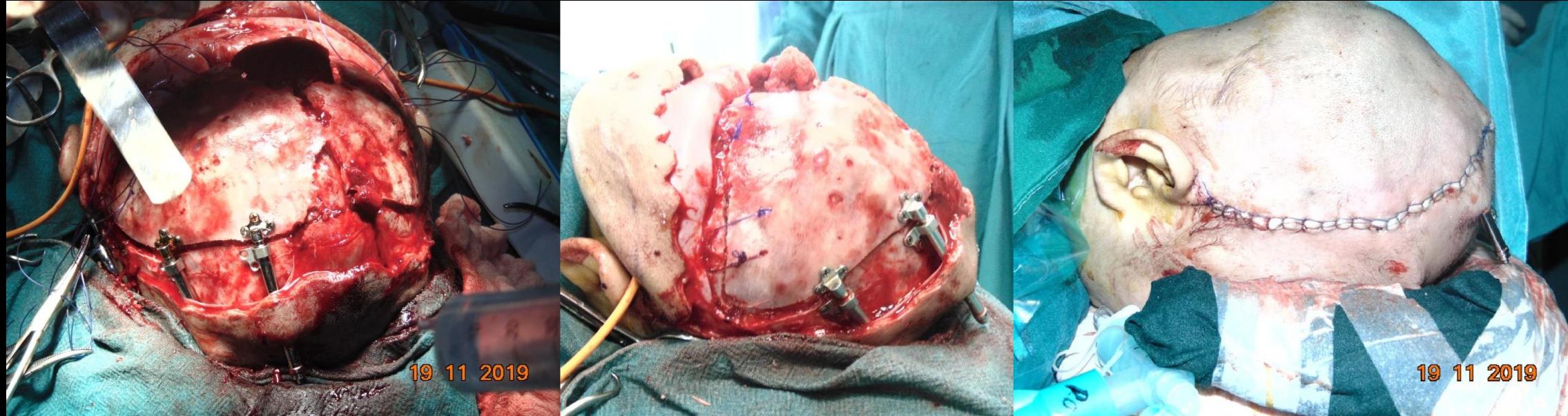
Posterior Cranial Vault Distraction



Raising Occipital Flap



Posterior Cranial Vault Distraction



Distractor Placement and Closure



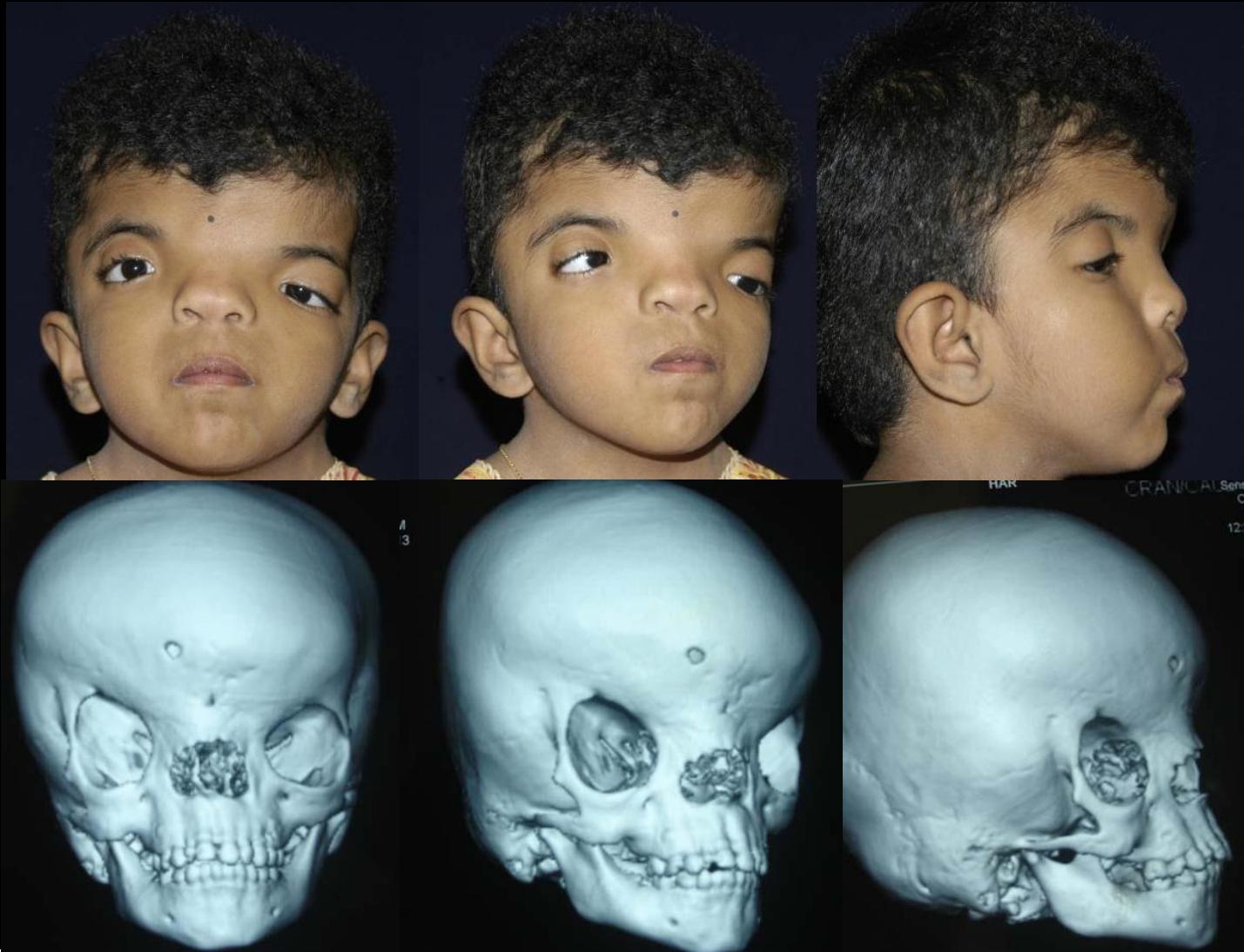
Pre Op Post Op



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Craniofacial Dysostosis

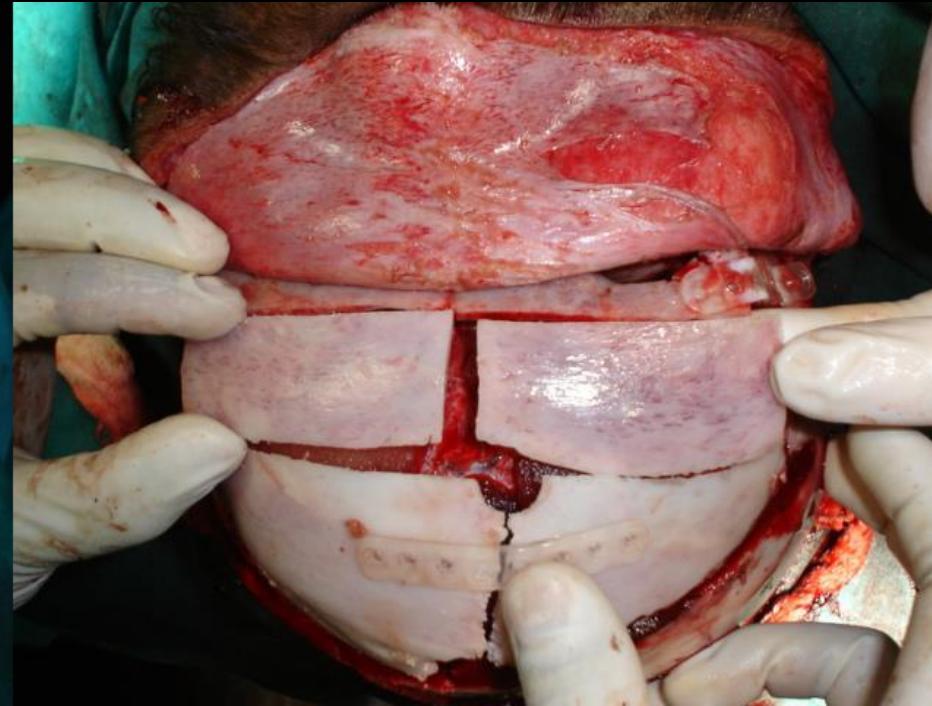
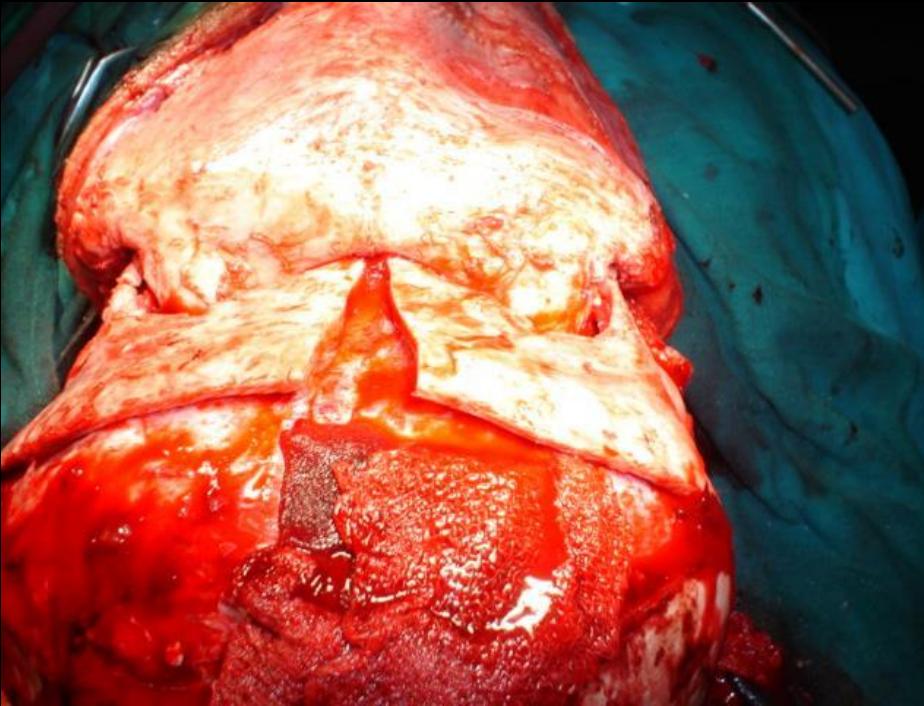
Pfeiffer Syndrome



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Craniofacial Dysostosis

Pfeiffer Syndrome



Facial Bipartition

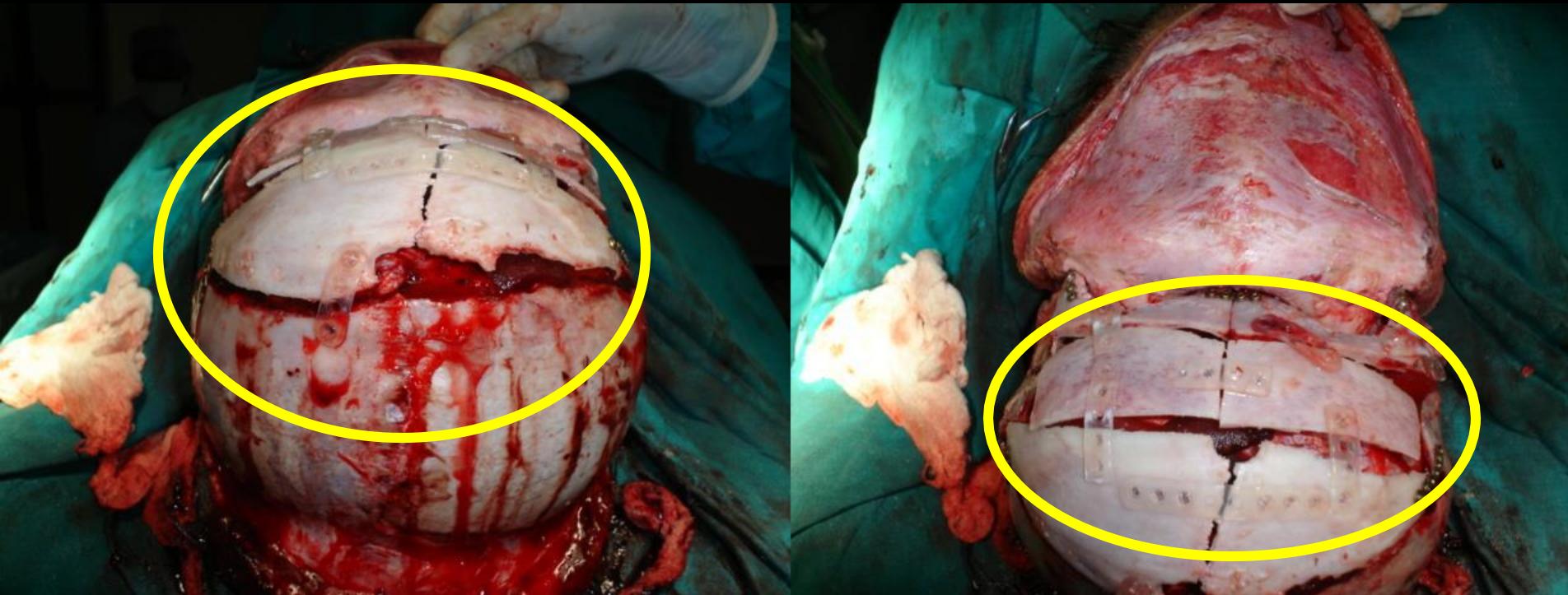
A monobloc osteotomy with the orbits and midface in one unit is done.
When the defects are amenable, the monobloc is partitioned at the
midline



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Craniofacial Dysostosis

Pfeiffer Syndrome



Fixation

In children fixation is done with bioresorbable bone plates



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Craniofacial Dysostosis

Pfeiffer Syndrome



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TMJ Ankylosis



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TMJ SEQUELAE CHARACTERISTICS

UNILATERAL ANKYLOSIS

- Obvious deformity
- Deviation to affected side
- Chin receded with hypoplastic
- Mandible on affected side
- Lower border - concavity
- Cross bite
- Class II
- Condylar movements absent

BILATERAL ANKYLOSIS

- Mandible – micro but symmetrical
- Bird face deformity
- Neck chin angle - absent
- Multiple carious tooth
- Upper incisors often protrusive



SURGICAL MANAGEMENT OF TMJ ANKYLOSIS

Resection – Ankylosis mass

Reconstruction – Correction of Asymmetry



Resection

- Condylectomy
- Gap arthroplasty
- Interpositional arthroplasty



Reconstruction of Facial Asymmetry

Genioplasty

Distraction Osteogenesis

Orthognathic surgery



Genioplasty

Done for correcting the assymetry of the genium in the antero posterior
And vertical dimensions.

Sliding genioplasty:

mild deficiency in antero-posterior or
vertical dimension of the genium

Double sliding genioplasty:

Significant deficiency of the antero-
posterior dimension of the genium

Propeller genioplasty:

asymmetry combined with mild deficiency
in vertical and antero-posterior dimension
of the genium



Incision



‘Crown’ incision / Mommart’s incision is given to avoid vestibular shortening and tension free closure.



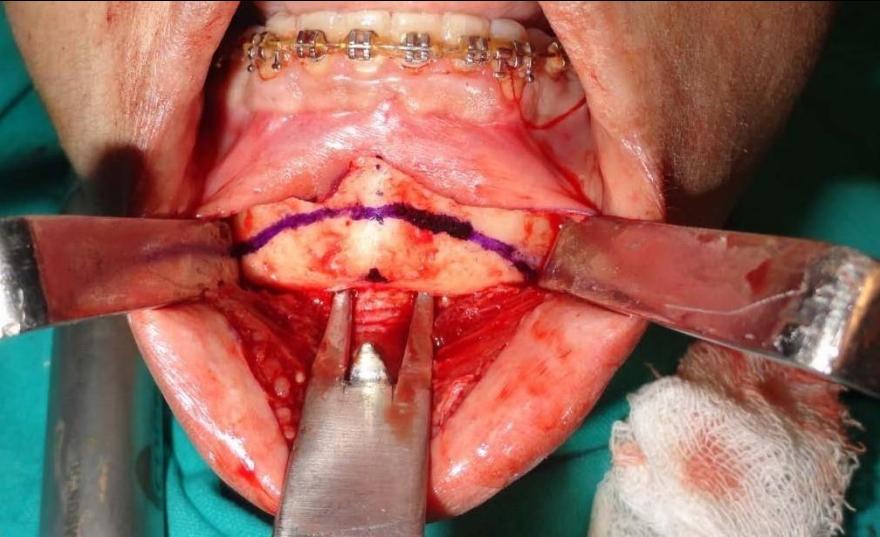
Sliding Genioplasty



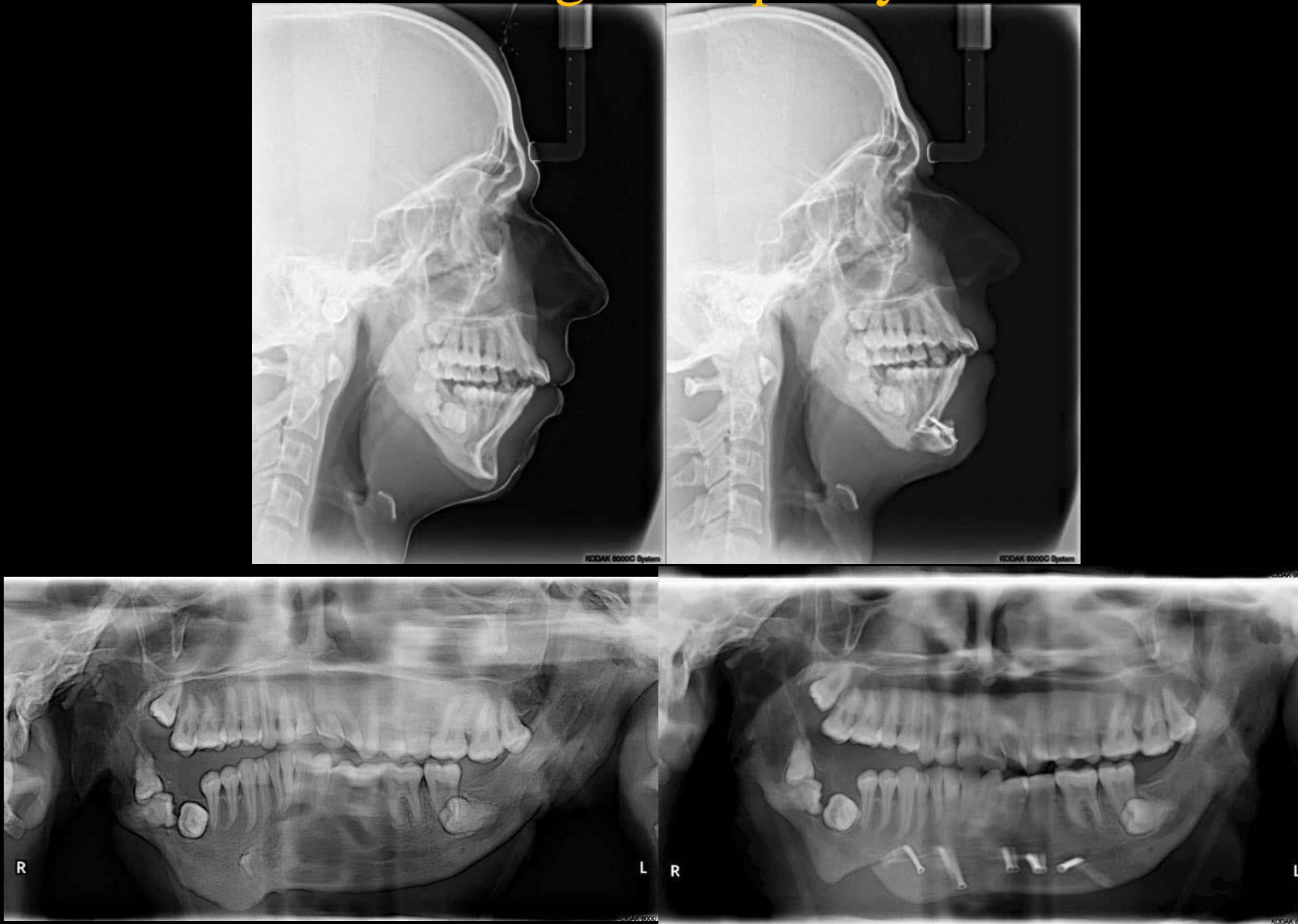
Done when there is a mild asymmetry and deficiency of the antero posterior dimension of the genium



Sliding Genioplasty



Sliding Genioplasty



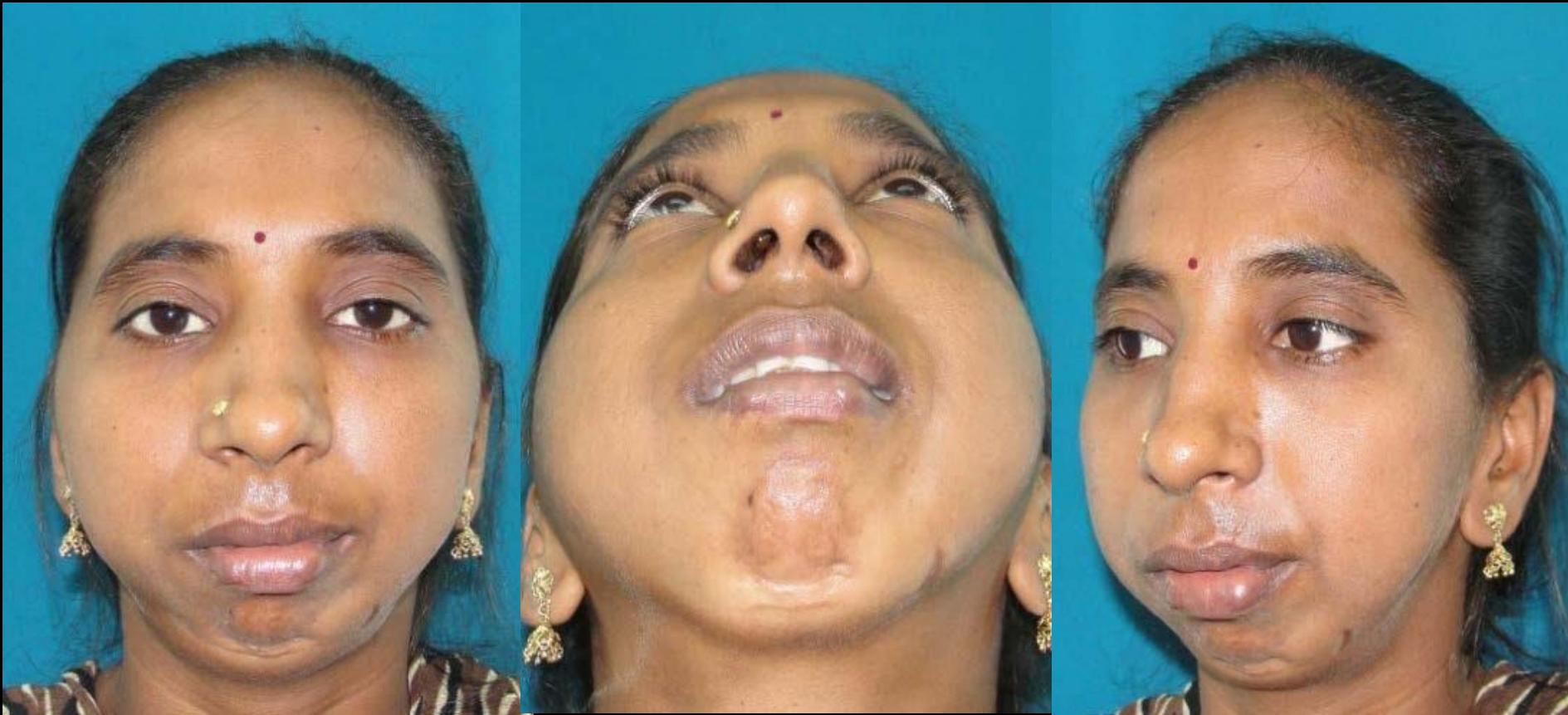
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Sliding Genioplasty



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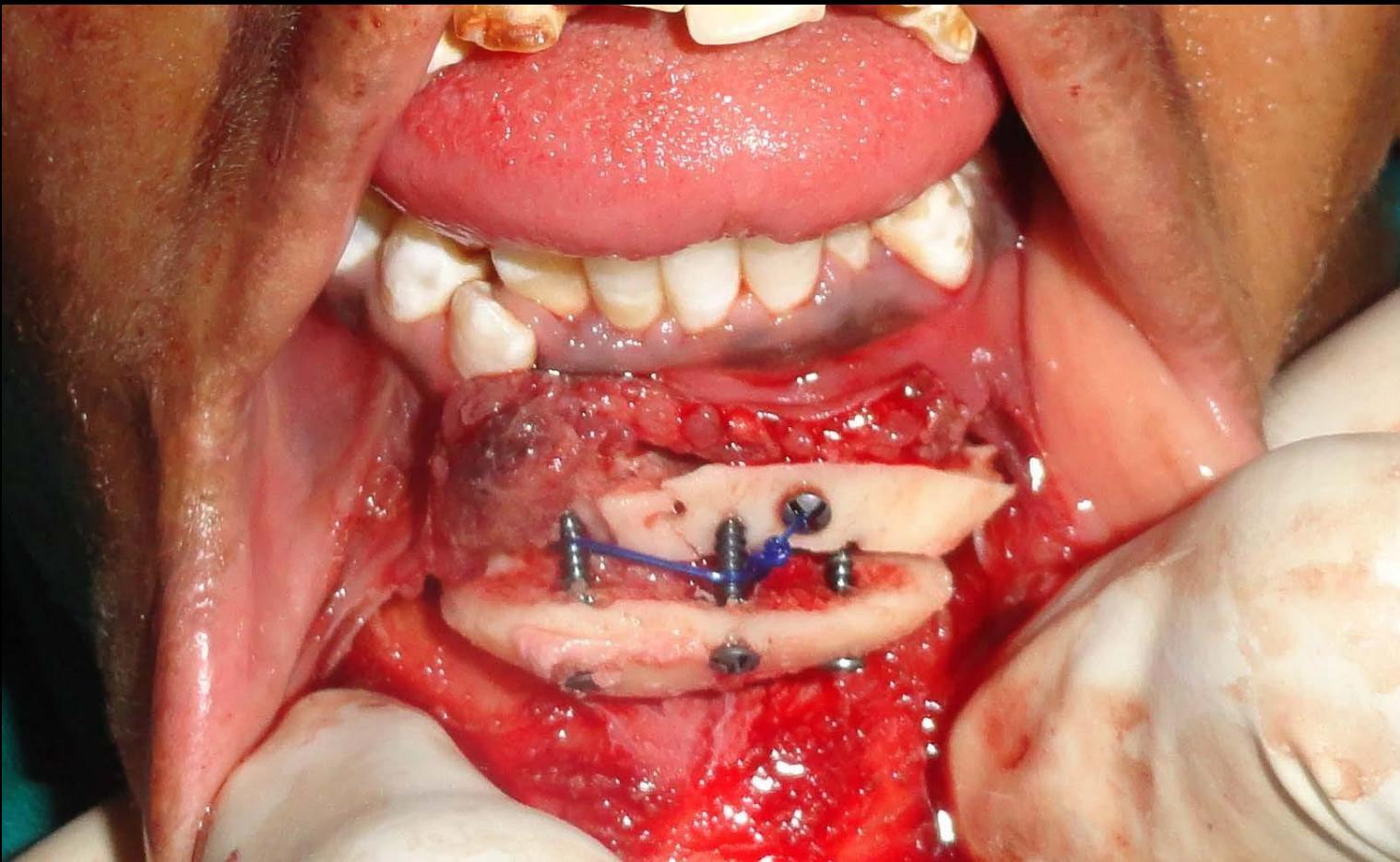
Double Sliding Genioplasty



Done when there is a significant deficiency in antero-posterior or vertical dimension of the genium

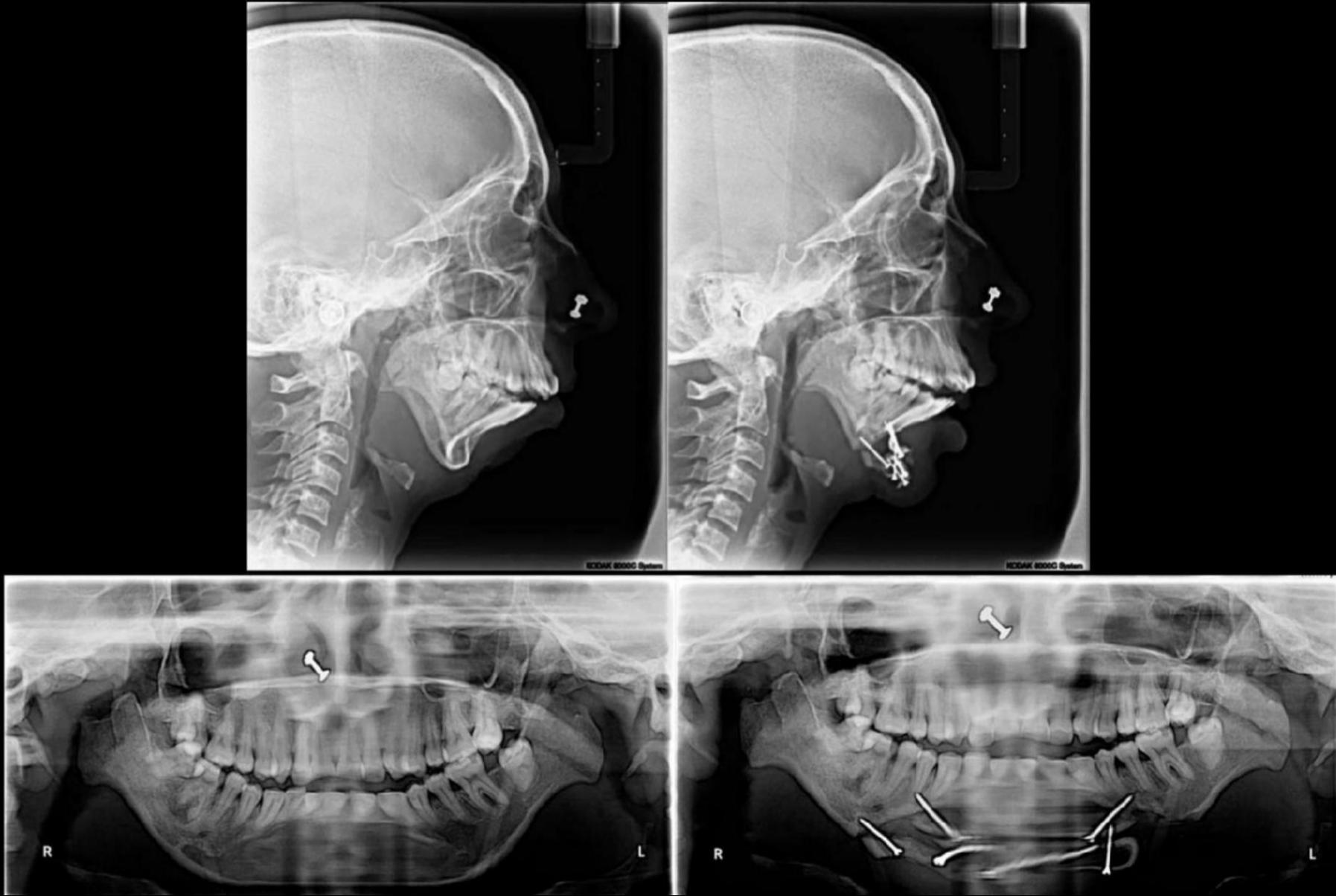


Double Sliding Genioplasty



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Double Sliding Genioplasty



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Double Sliding Genioplasty



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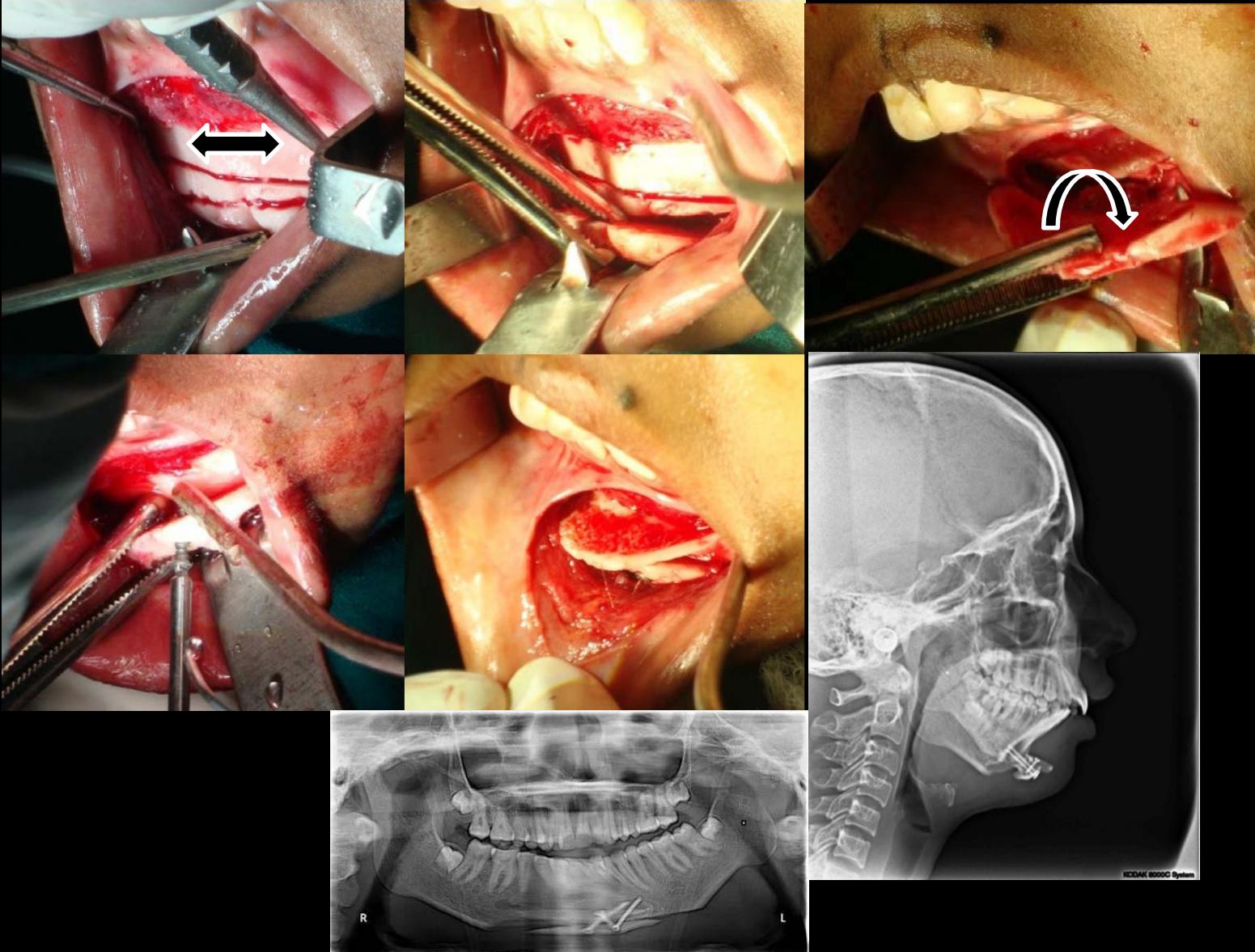
Propeller Genioplasty



Done when there is asymmetry combined with mild deficiency in vertical and antero-posterior dimension of the genium



Propeller Genioplasty



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Propeller Genioplasty (Asymmetric Jawline)



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Types of Distraction Osteogenesis

- Direction
 - Uni-directional
 - Bi-directional
- Placement
 - Intraoral
 - Extraoral
- Maxillo Mandibular Distraction: For correcting maxillary cant
- Morphofunctional Distraction: Done before TMJ resection to correct sleep apnea



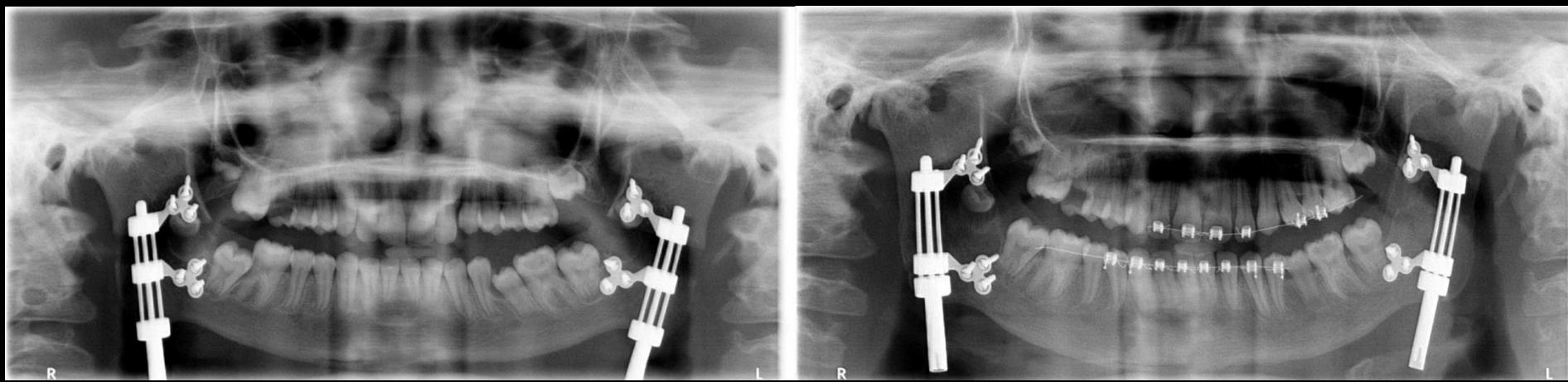
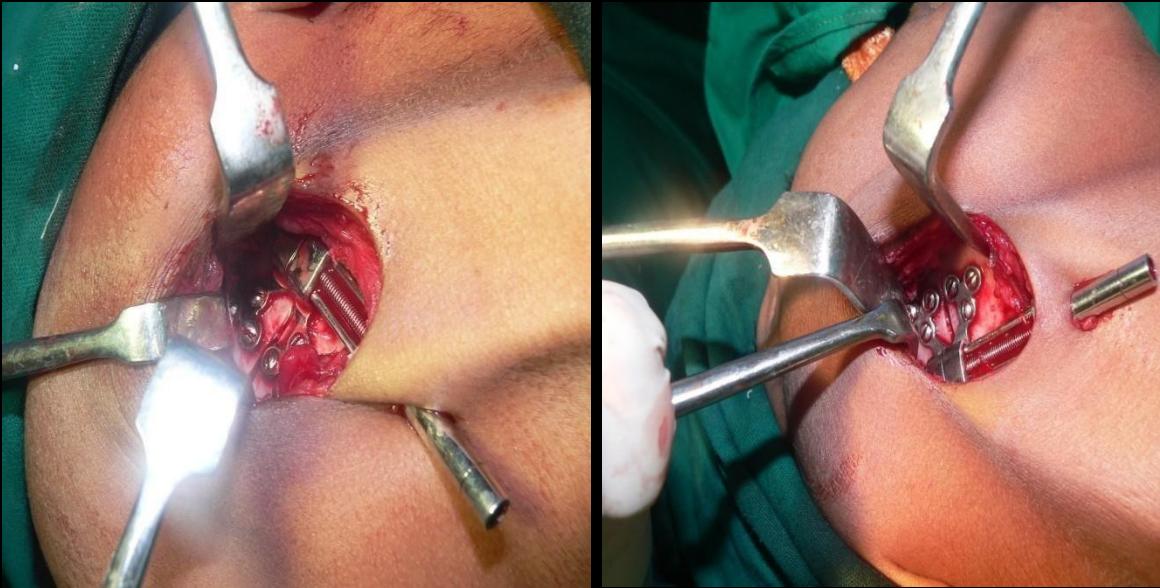
Intraoral Uni-directional Distraction Osteogenesis

STAGE I – Distraction Osteogenesis by using intra oral ramal distractor

STAGE II - Bilateral release of ankylosis and removal of distractors



Distractor placement and distraction



12 mm distraction

20 mm distraction



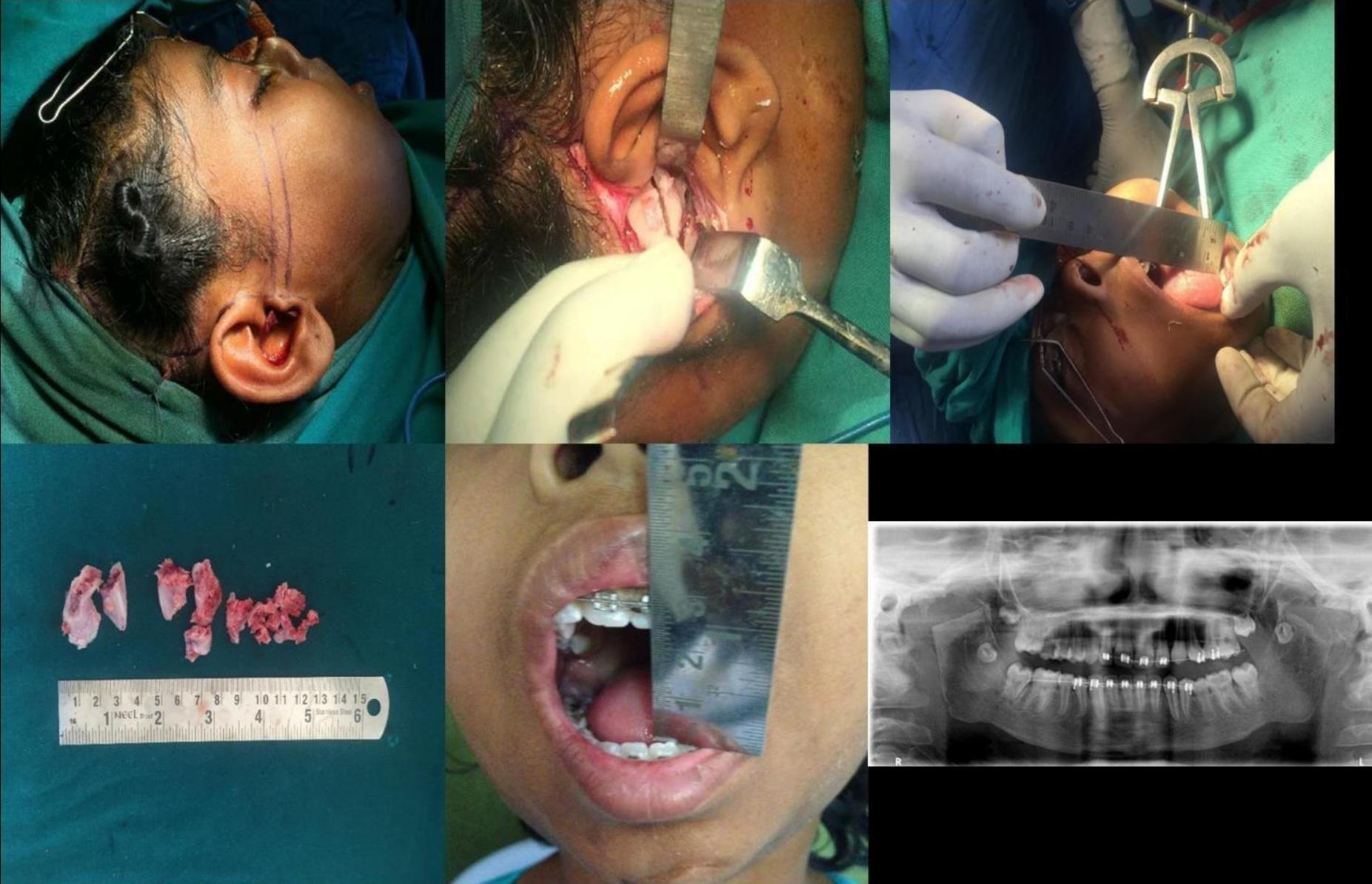
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Pre-operative status for distractor removal



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Bilateral TMJ Ankylosis release simultaneous distractor removal



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Intraoral Uni-directional Distraction Osteogenesis



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Intraoral Uni-directional Distraction Osteogenesis



Post op 5 months



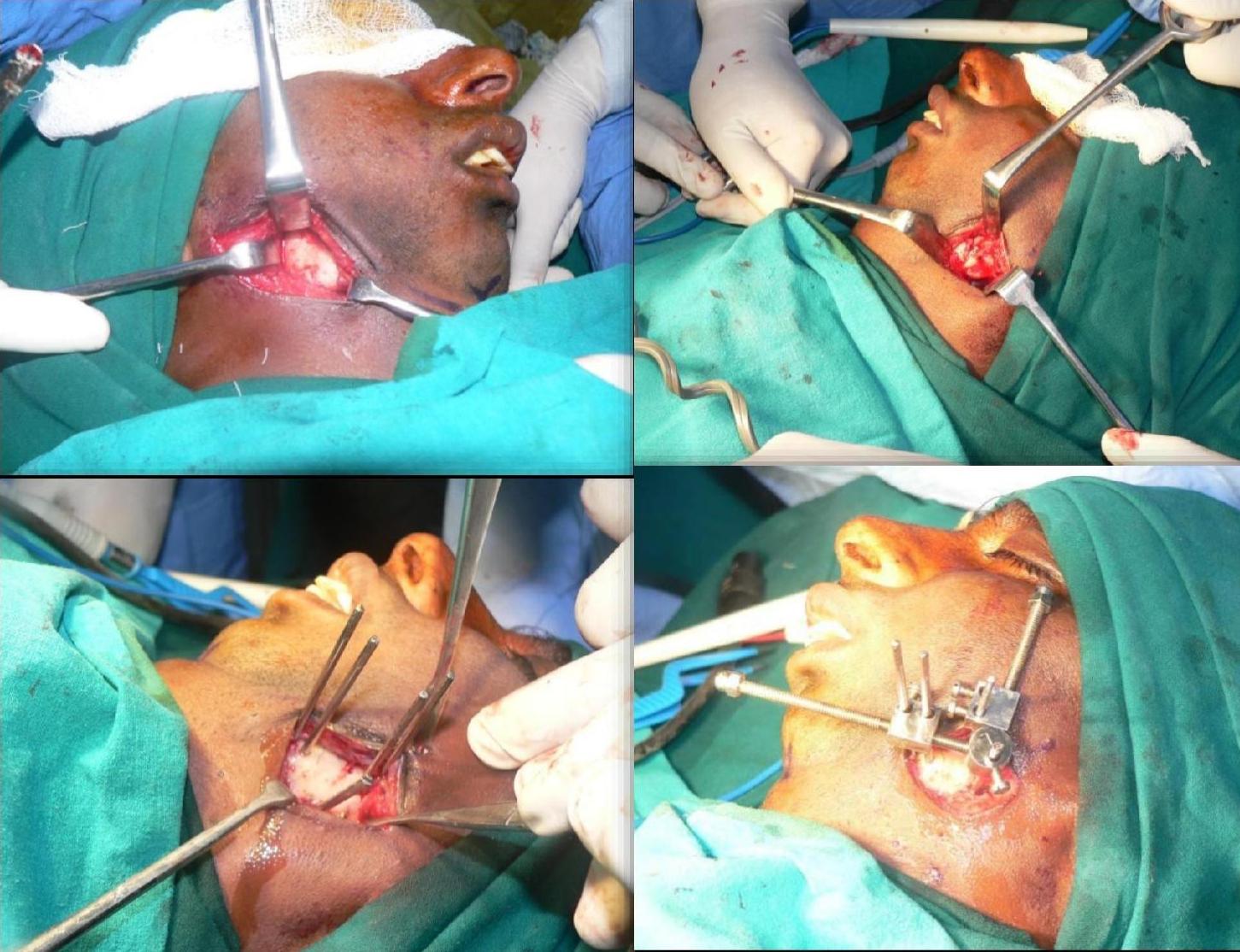
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Extraoral Bi-directional Distraction Osteogenesis



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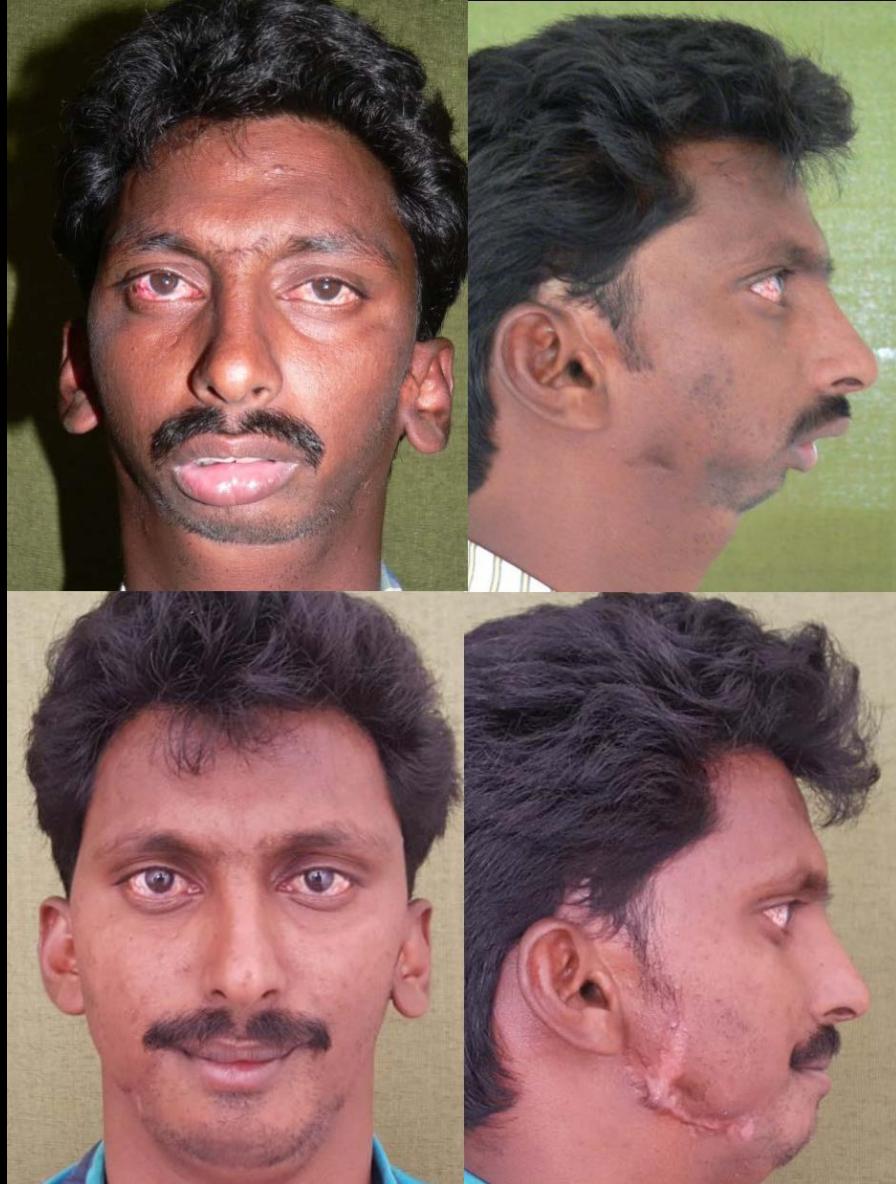
Bi-directional distractor placement



0-24mm Distraction



Extraoral Bi-directional Distraction Osteogenesis

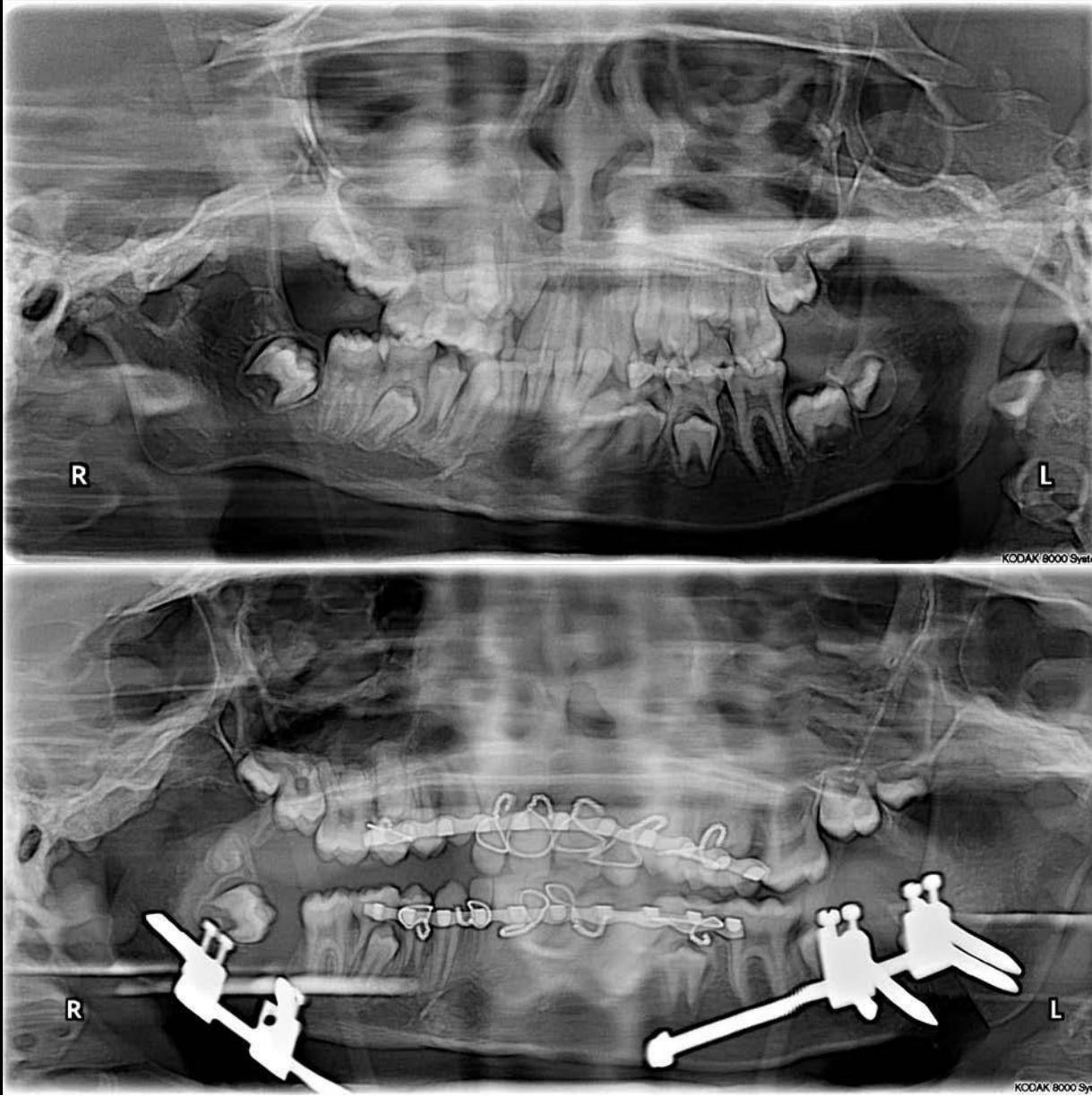


Extraoral Uni-directional Distraction Osteogenesis



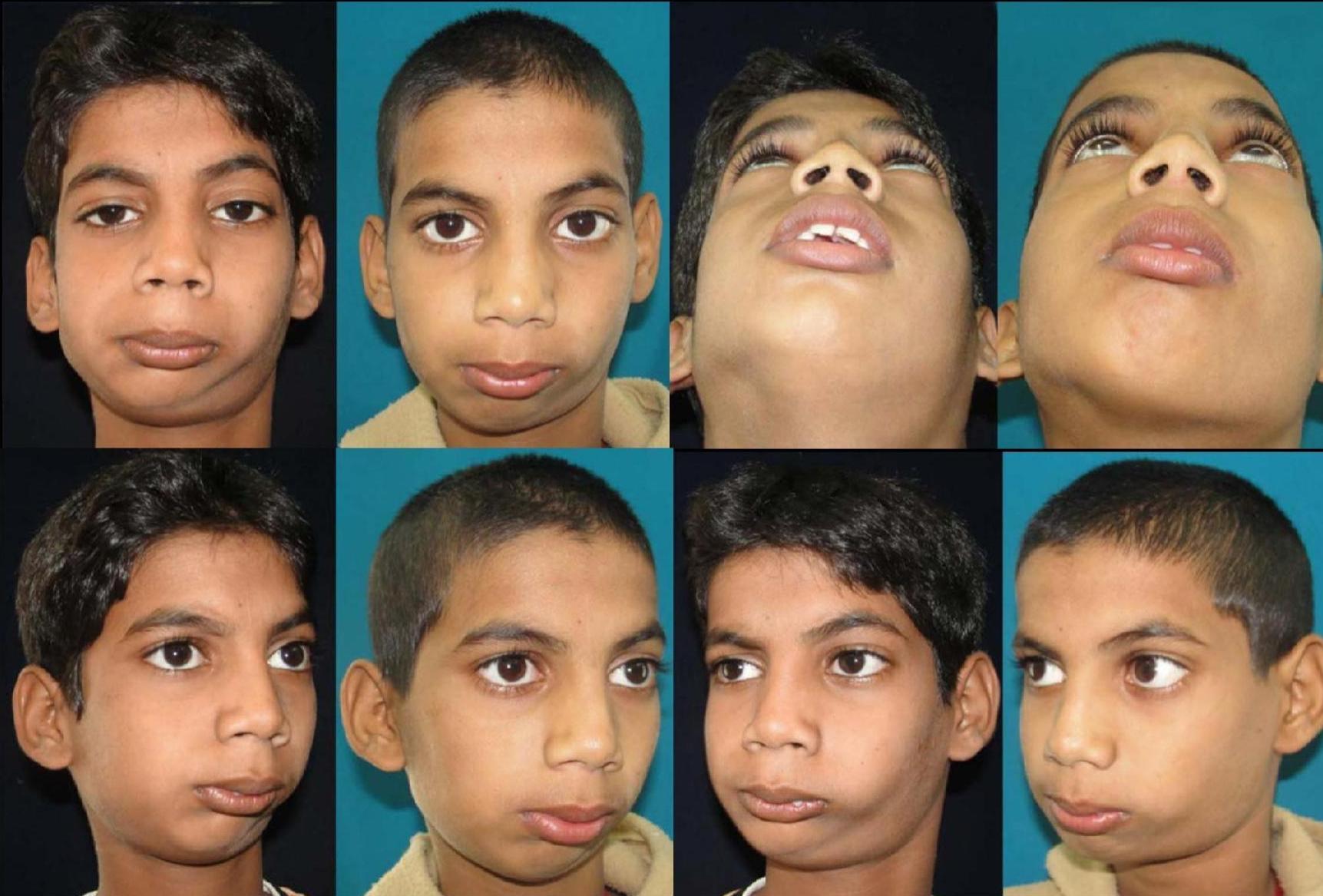
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Extraoral Uni-directional Distraction Osteogenesis

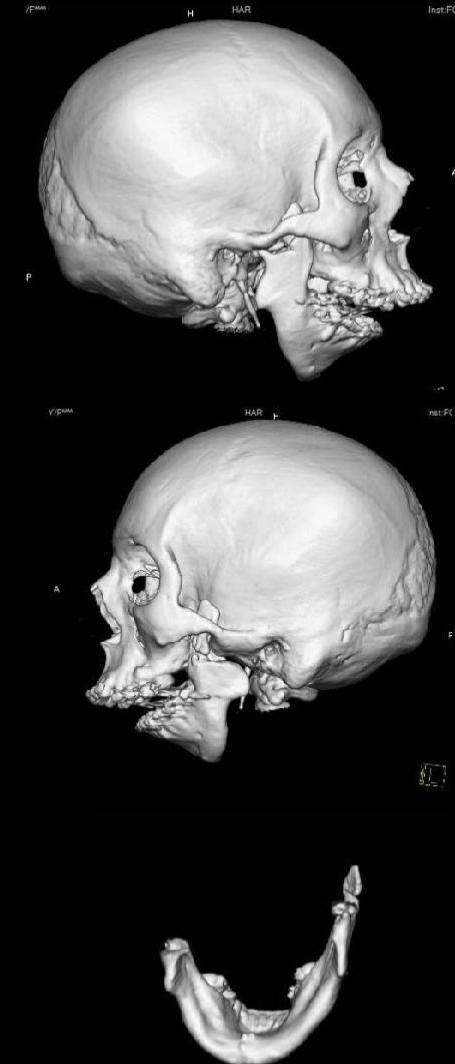


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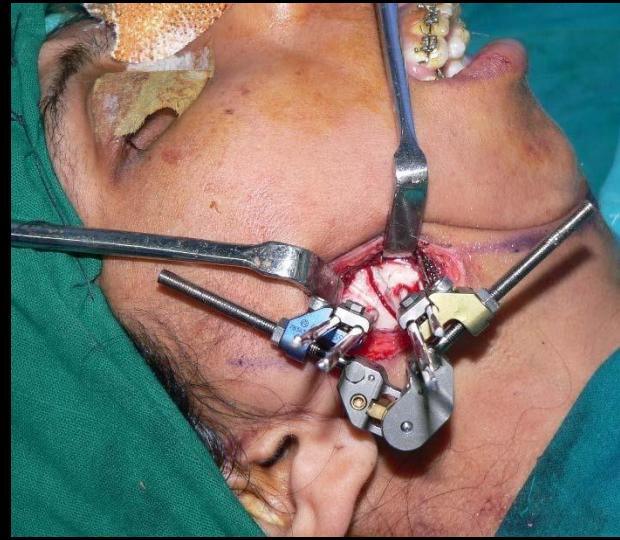
Extraoral Uni-directional Distraction Osteogenesis



Distraction Osteogenesis and Orthognathic Surgery for correction of Maxillo-Mandibular defect after TMJ ankylosis release

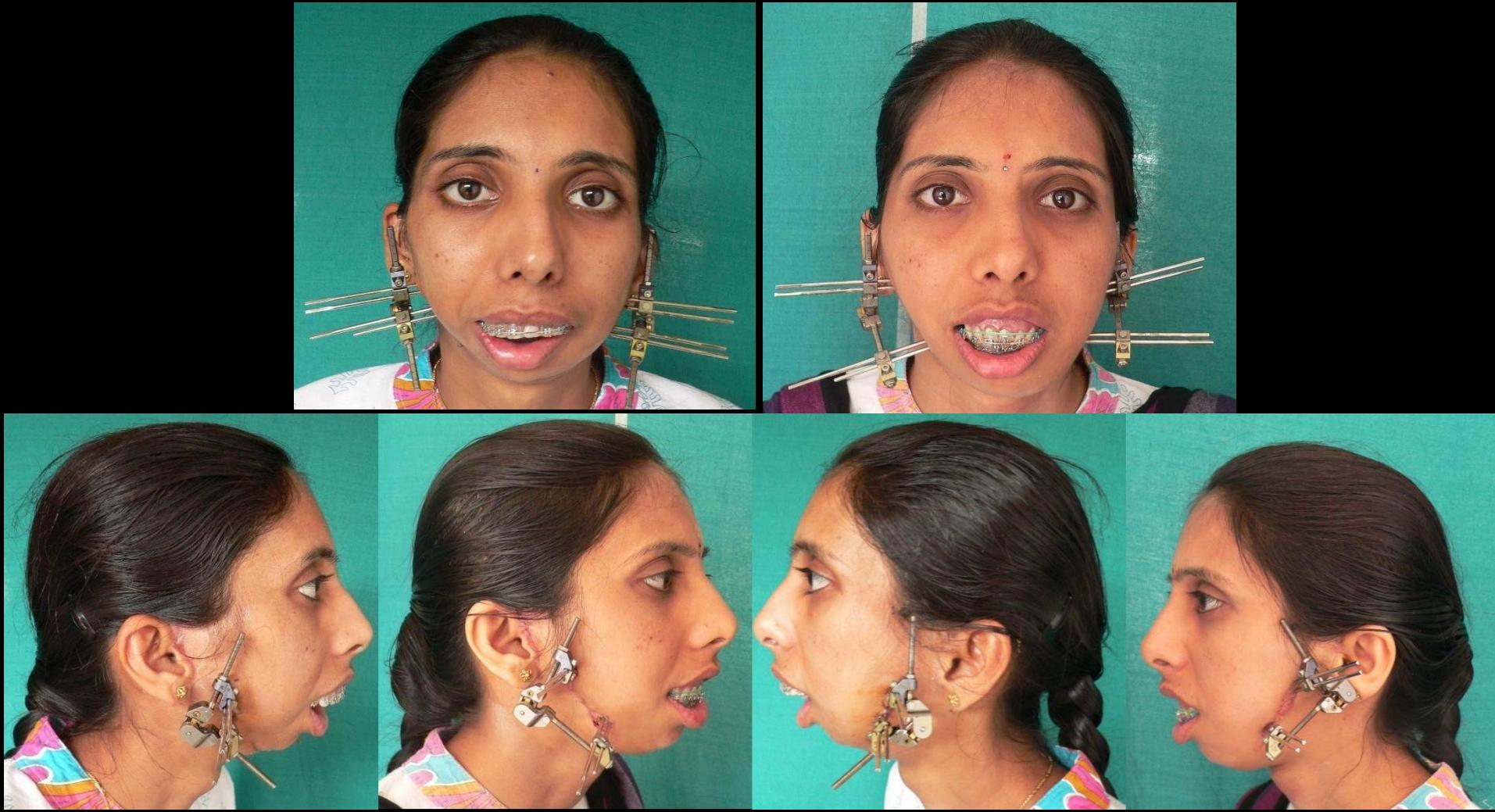


Multivector distractor placement



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0-22mm Distraction





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Distractor removal after 6 months

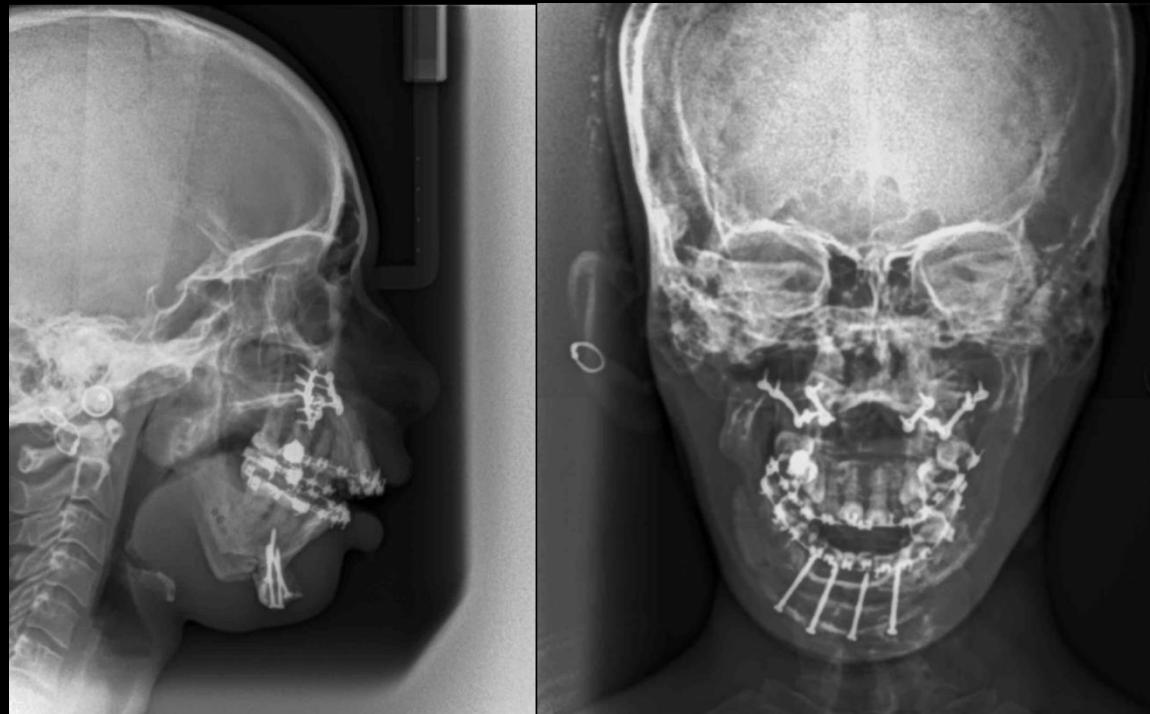


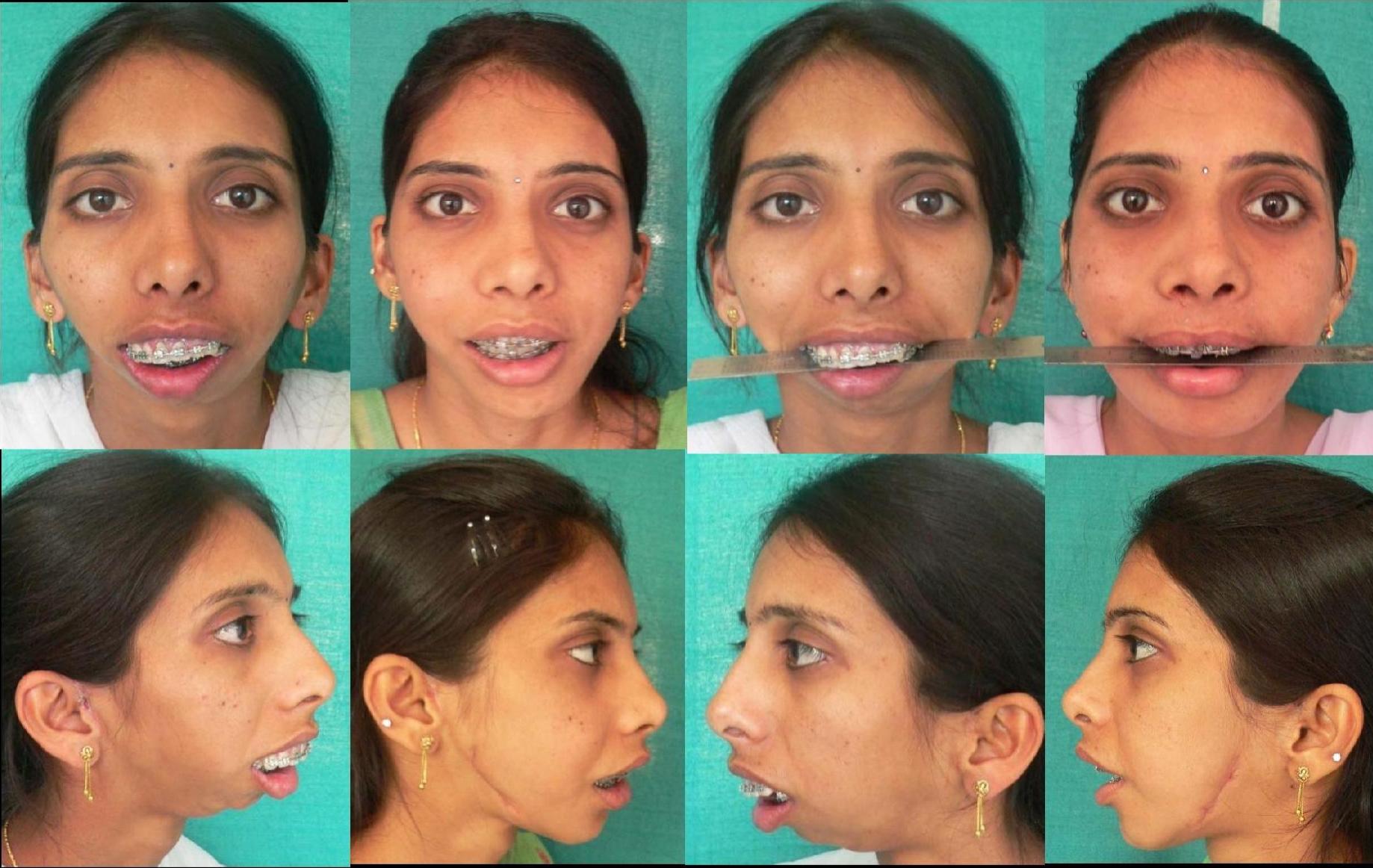
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Lefort I impaction with genioplasty



Lefort I impaction with genioplasty





Orthognathic management of Asymmetry due to Ankylosis



PRE-OP

POSTOP 3 MONTHS

POSTOP 6 MONTHS

POSTOP 1 YEAR

- It is very important to counsel the patient about bone remodelling which takes up-to 1 year to show the outcome.



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POST TRAUMATIC FACIAL DEFORMITIES



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PRINCIPLES OF MANAGEMENT

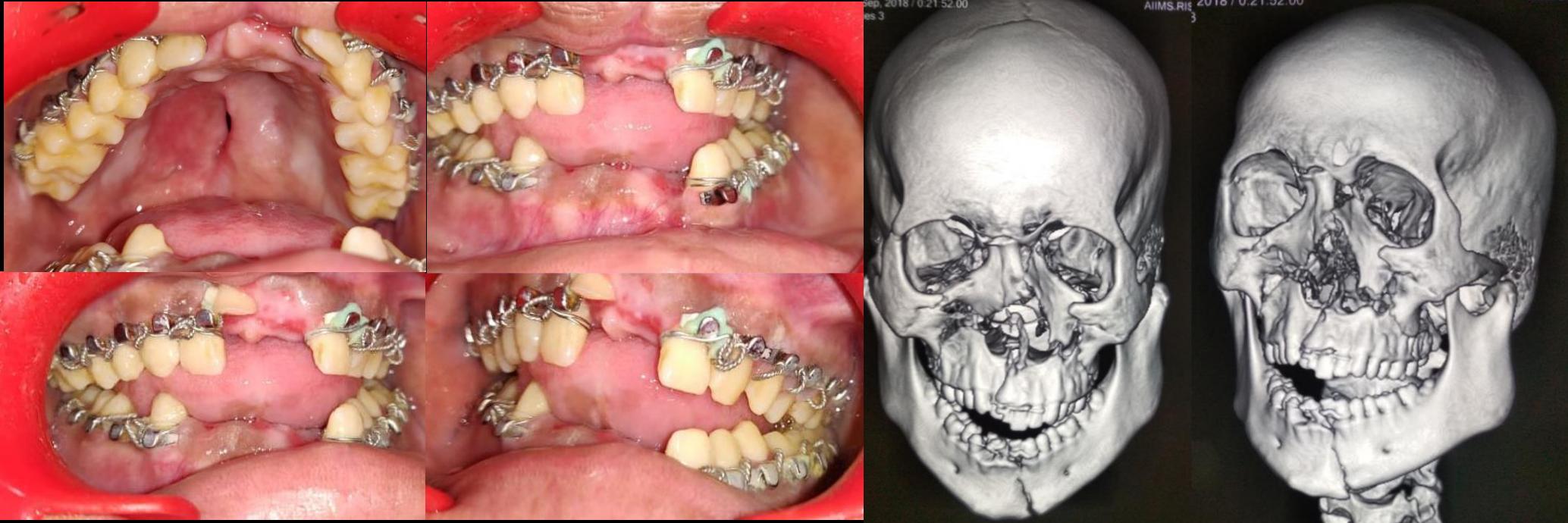
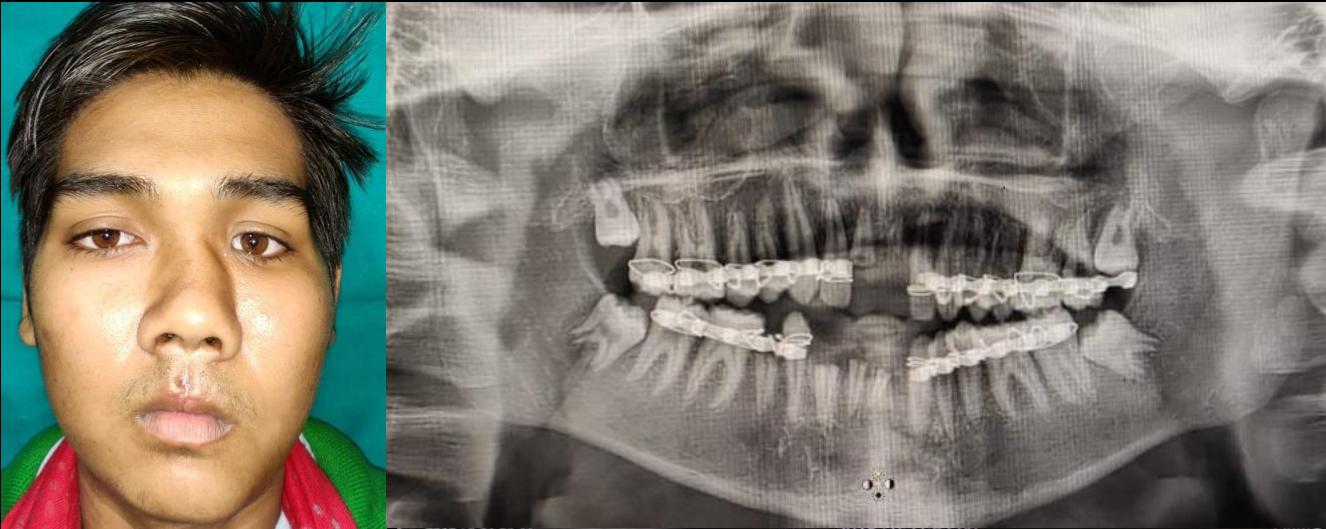
- ACCURATE ASSESSMENT
- TREATMENT PLANNING
- SURGERY
 - OSTEOTOMIES
 - BONE GRAFTING – to correct the hypoplasia



Pre operative

Diagnosis: Mal-united pan-facial fracture with bilateral lefort I, left ZMC and nasal bone fracture

Treatment done: Lefort I osteotomy through intra-oral approach plus rhinoplasty under GA



Post operative



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Pre-operative



Diagnosis: Mal-united bilateral condylar fracture and left body fracture mandible

Treatment done: Bilateral sagittal split osteotomy through intra-oral approach under GA



Post-operative



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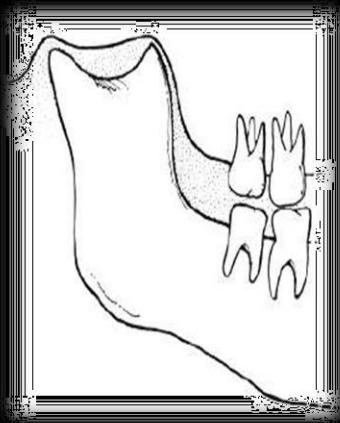
HEMIFACIAL MICROSOMIA



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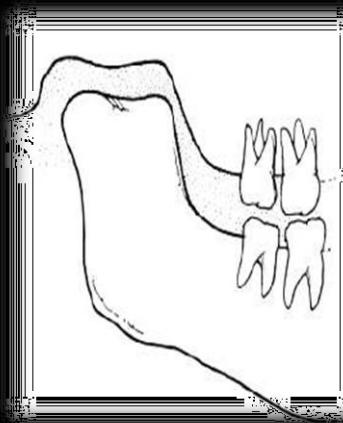
Classification Pruzansky &

Kaban 1988



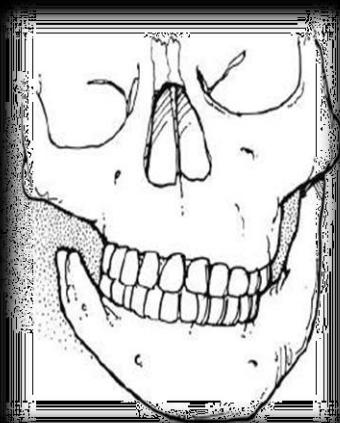
Type I

All structures of the mandible are present but hypoplastic



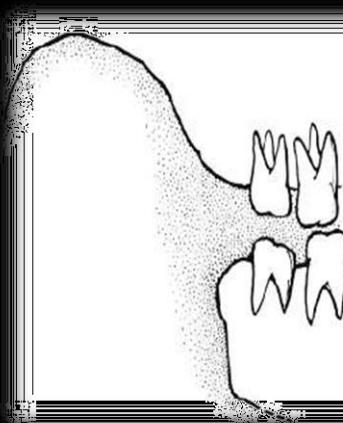
Type IIa

Hypoplastic but Absent Condyle and Coronoid Process at the level of Sigmoid Notch



Type IIb

Hypoplastic but Absent Condyle and Coronoid Process at the level of ascending ramus



Type III

Absent Ramus of mandible

Management

- Type 1
 - Orthodontic + Myofunctional
- Type 2 A/2 B
 - Distraction of hypoplastic mandible at an early age followed by Orthognathic surgery at skeletal maturity
- Type 3
 - Rib grafting + Distraction Osteogenesis



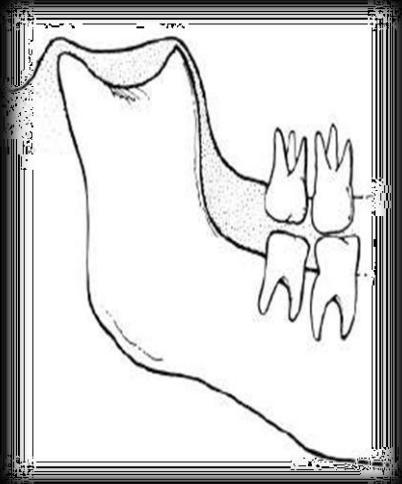
Treatment - vary considerably

Distraction
**Young
Children**

Osteotomy
**Older Children
Adults**

Onlay
**Older Children
Adults**



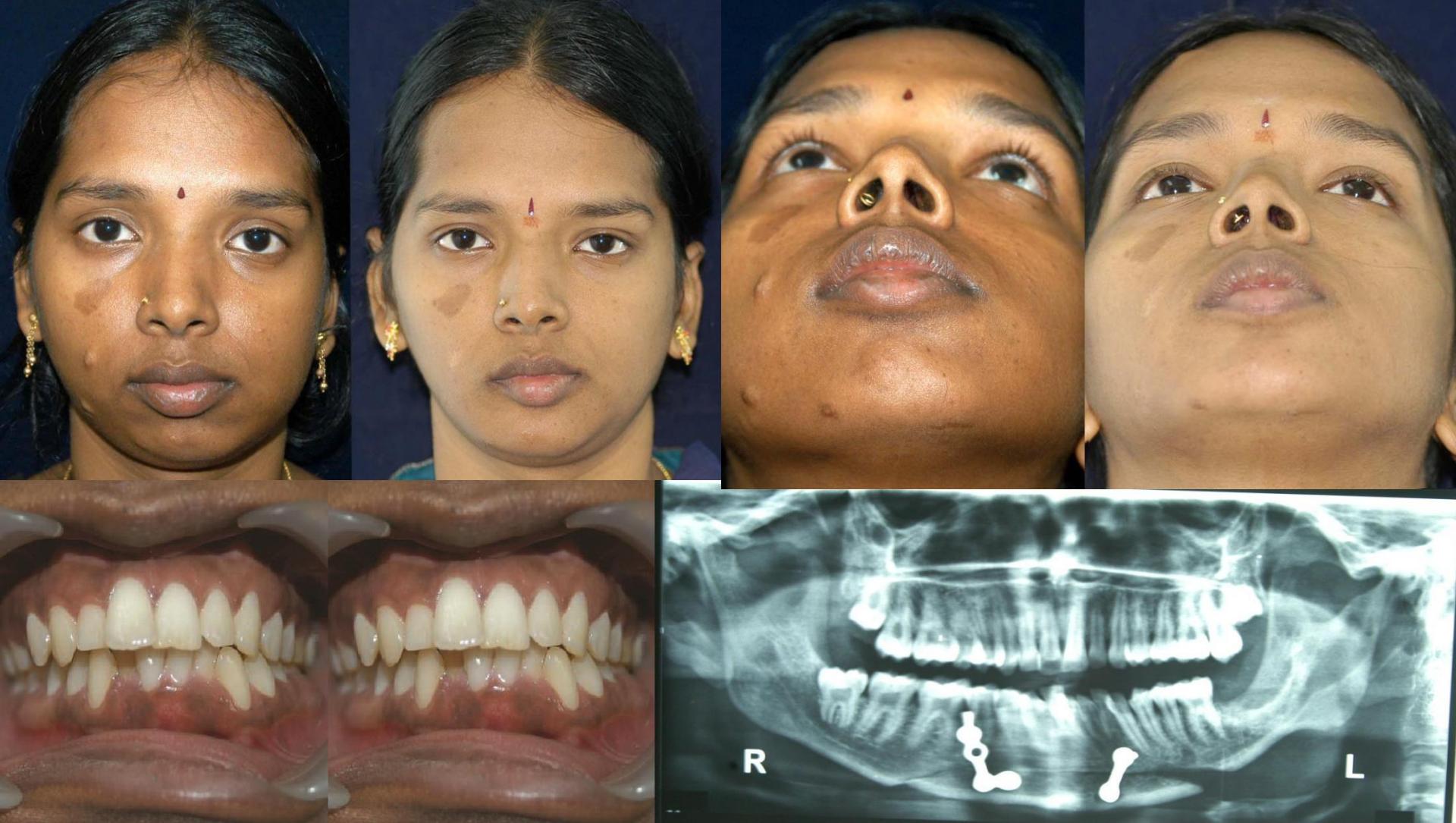


Clinical Features

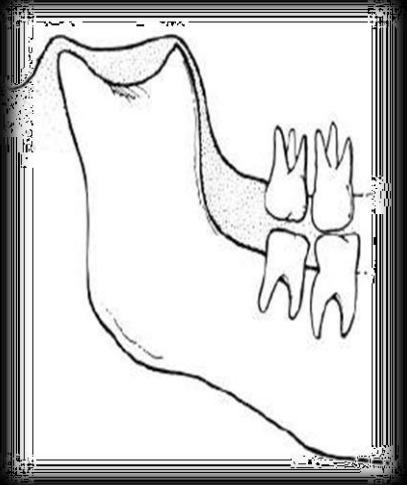
Type I



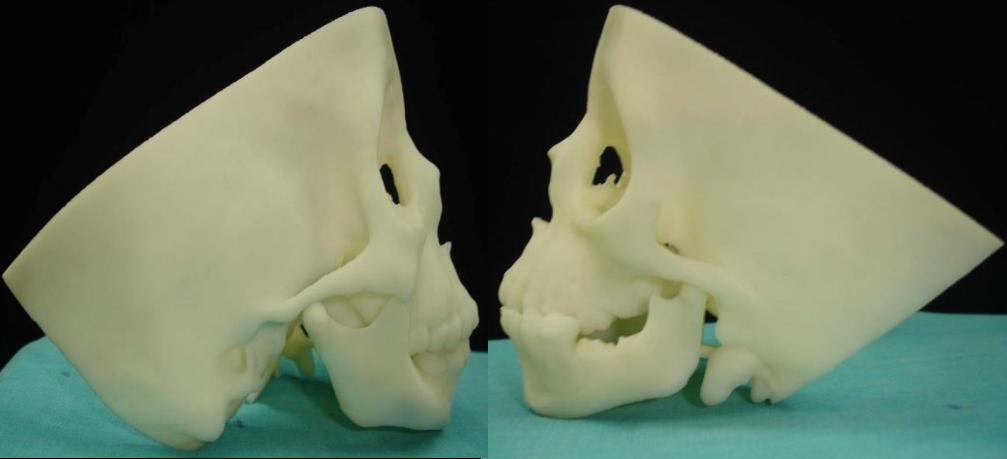
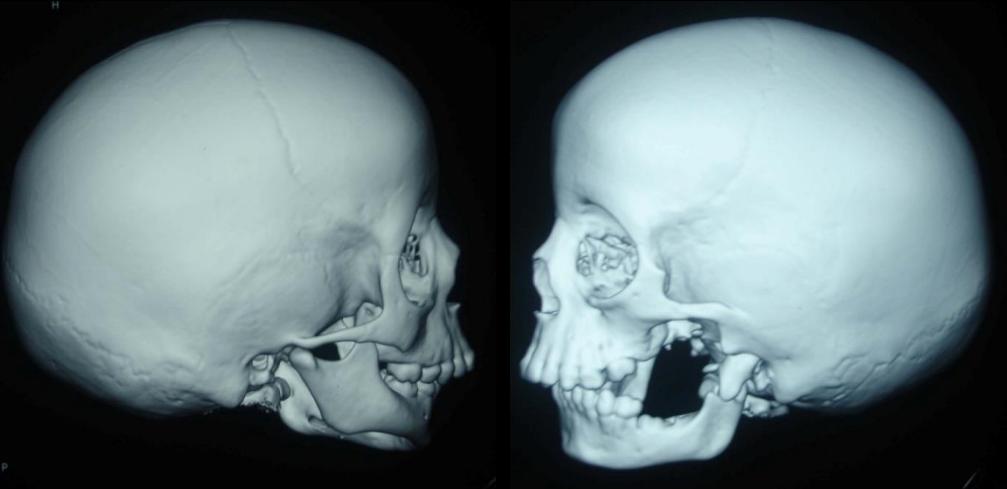
Type I HFM



Clinical Features



Type I



Type I HFM



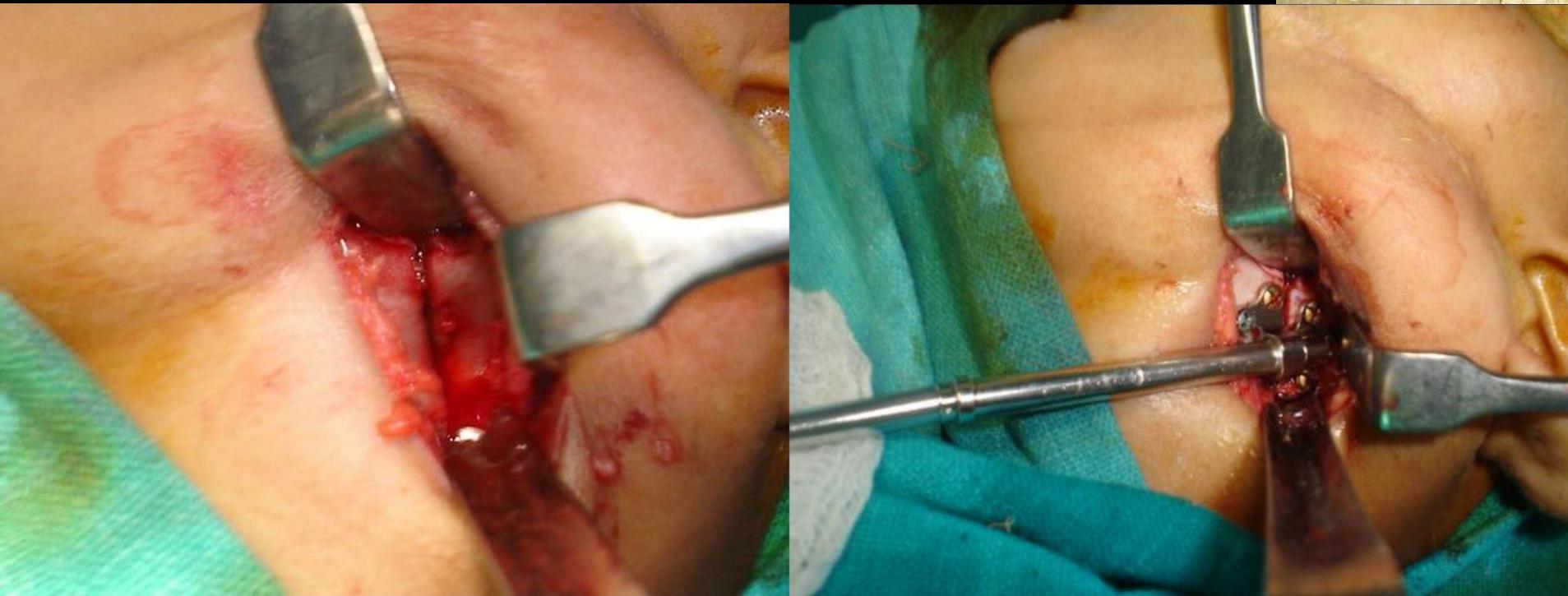
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Type I HFM Surgery Stage I



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Type I HFM Surgery Stage II



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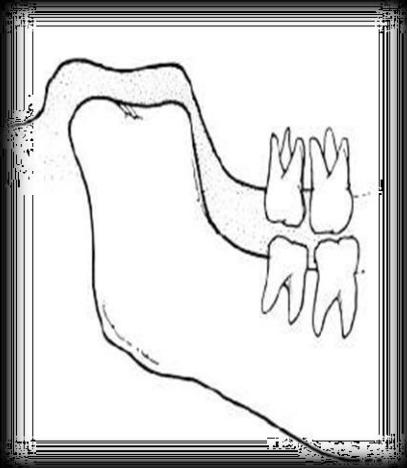
Type I HFM After

Surgery Stage II

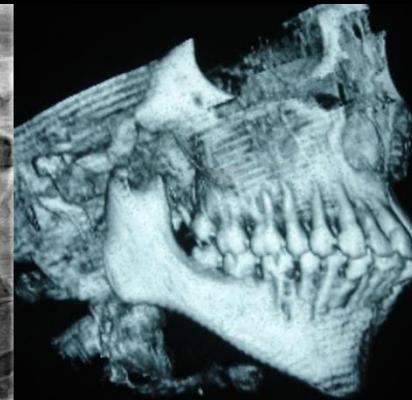
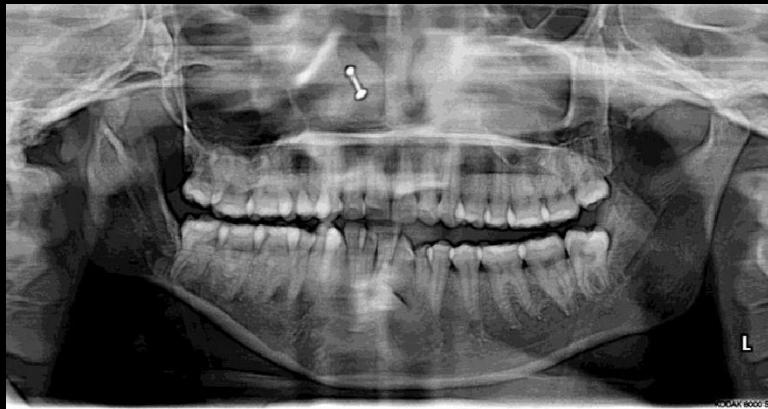


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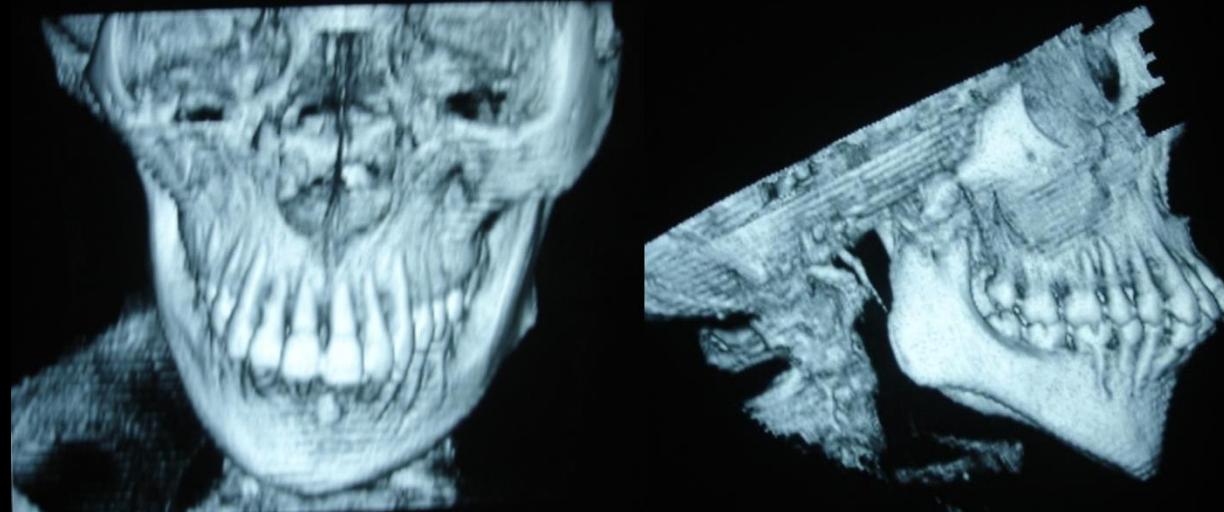
Clinical Features



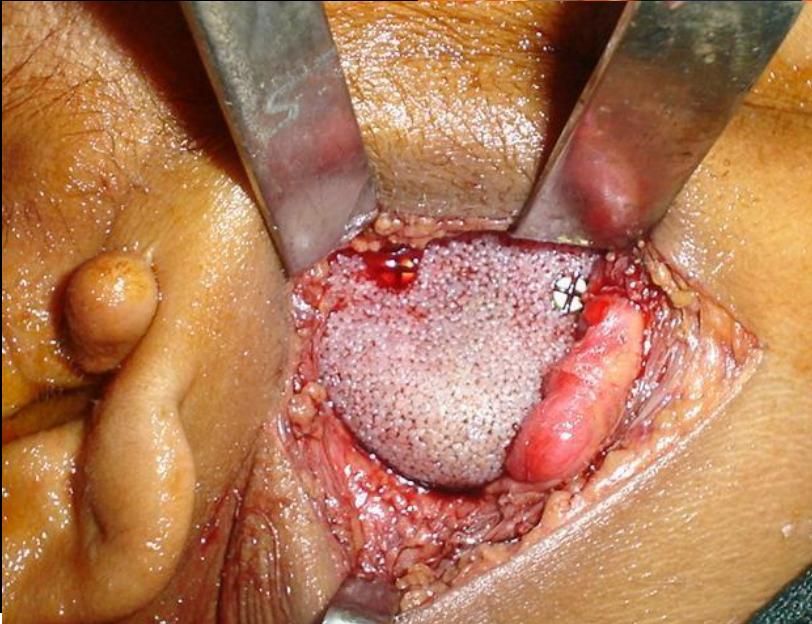
Type II a



Type II a HFM

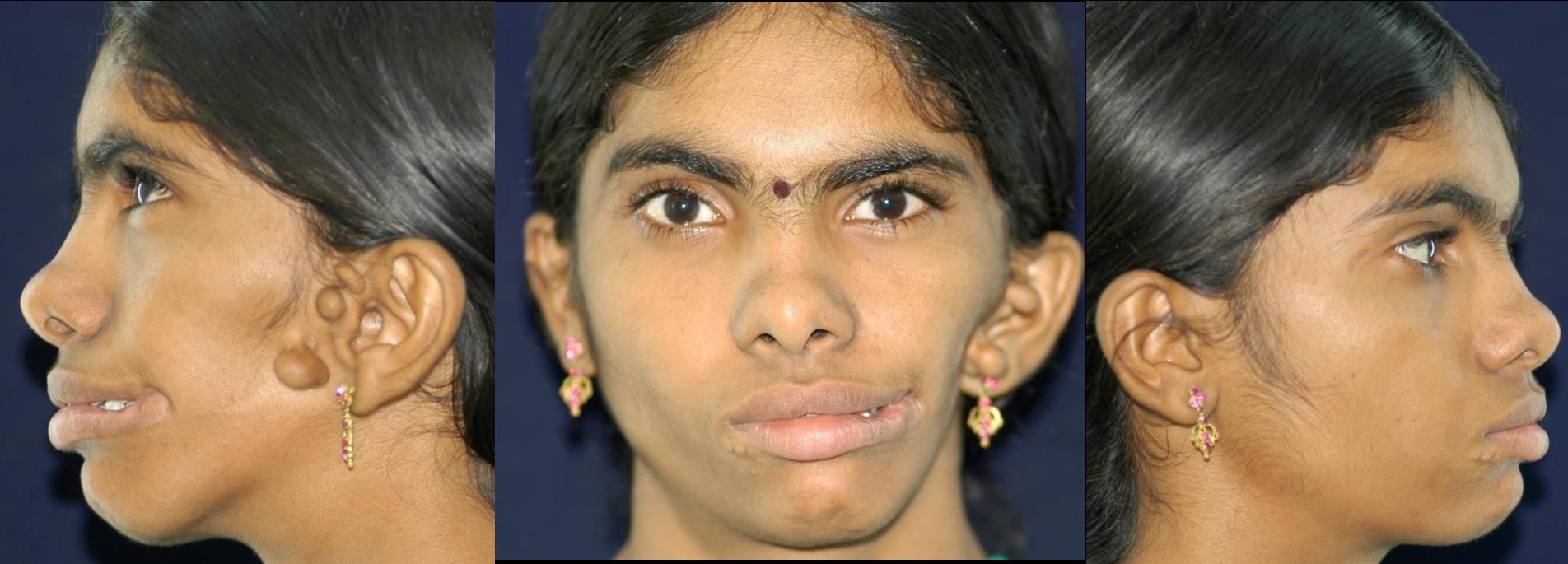


Type II a HFM Surgery



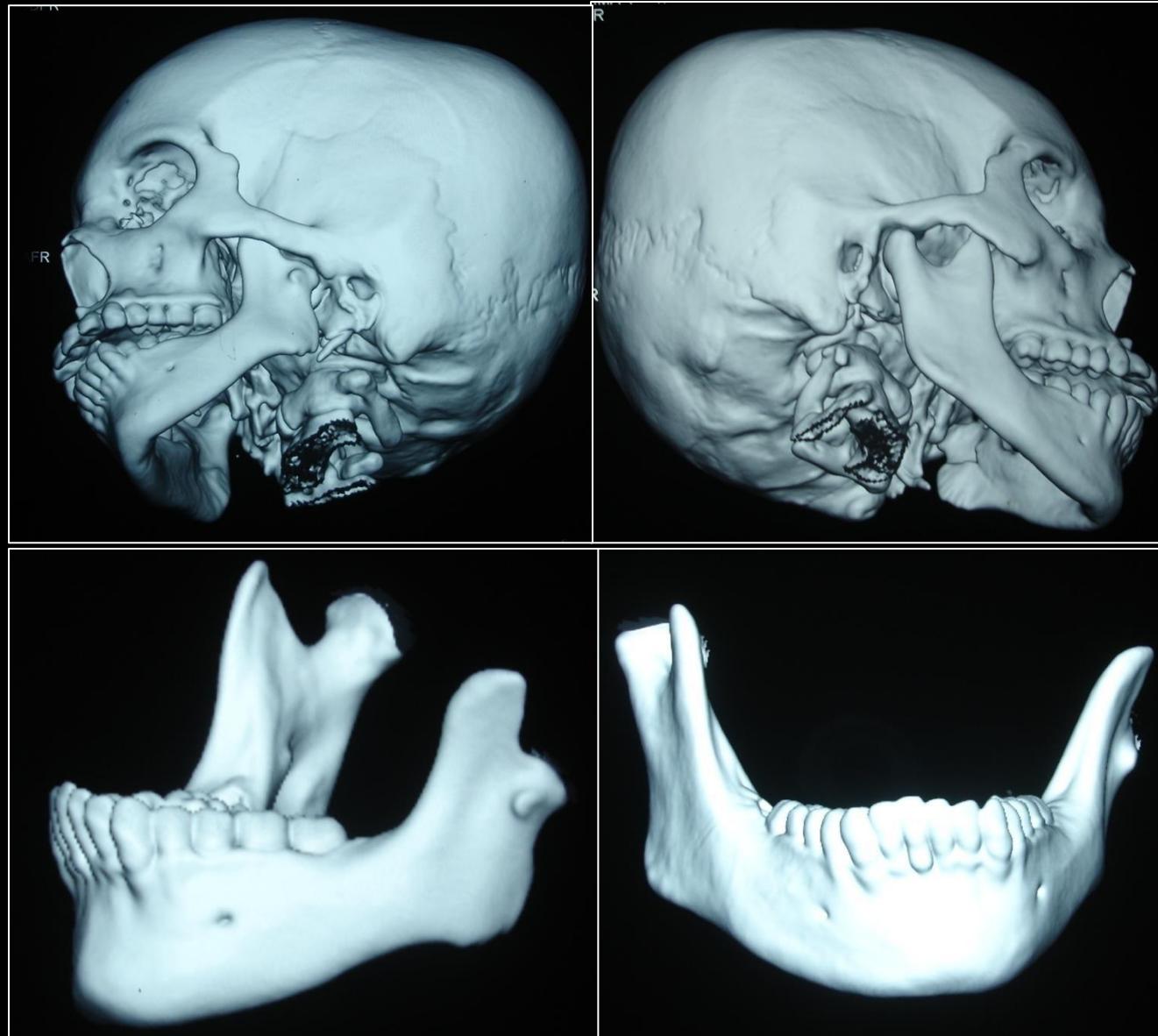
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Type II a HFM



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Type II a HFM



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Type II a HFM Surgery

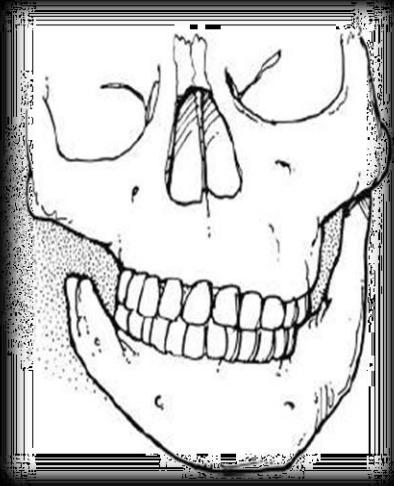


Type II a HFM Pre-op and

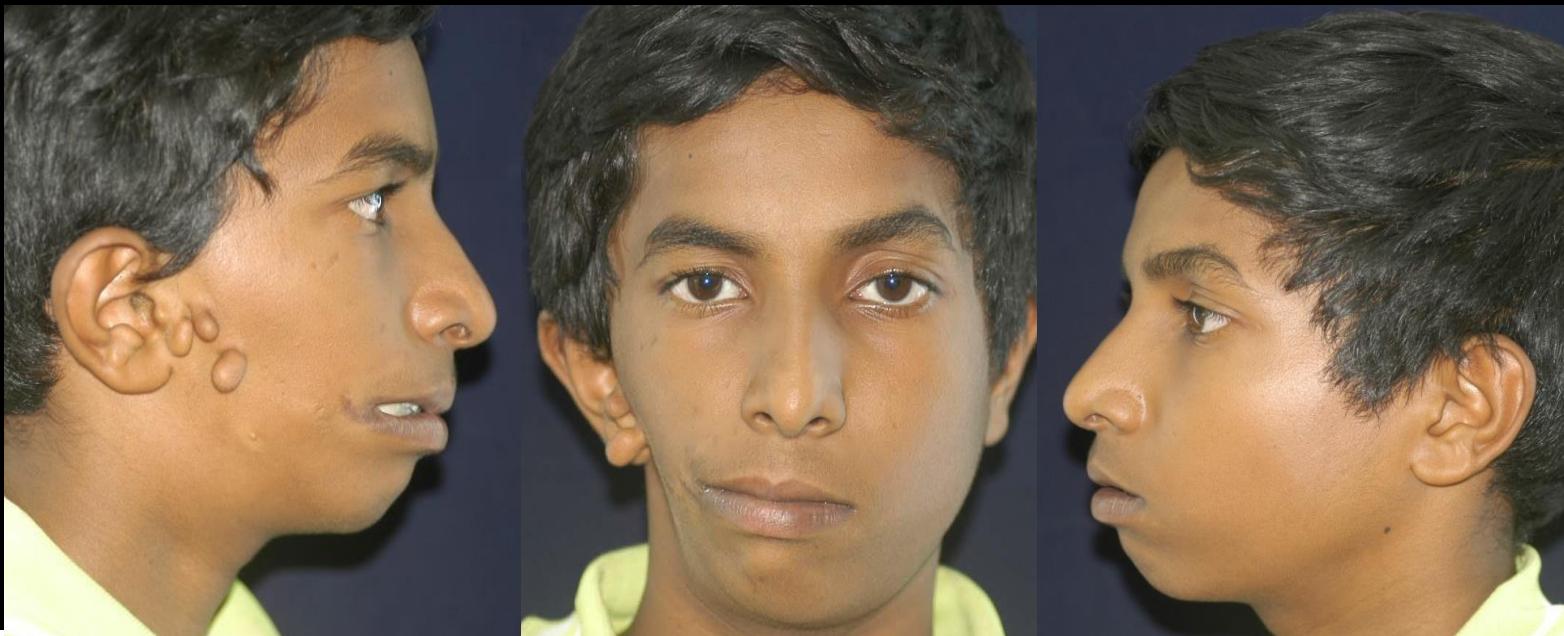
Post-Op



Clinical Features



Type II b

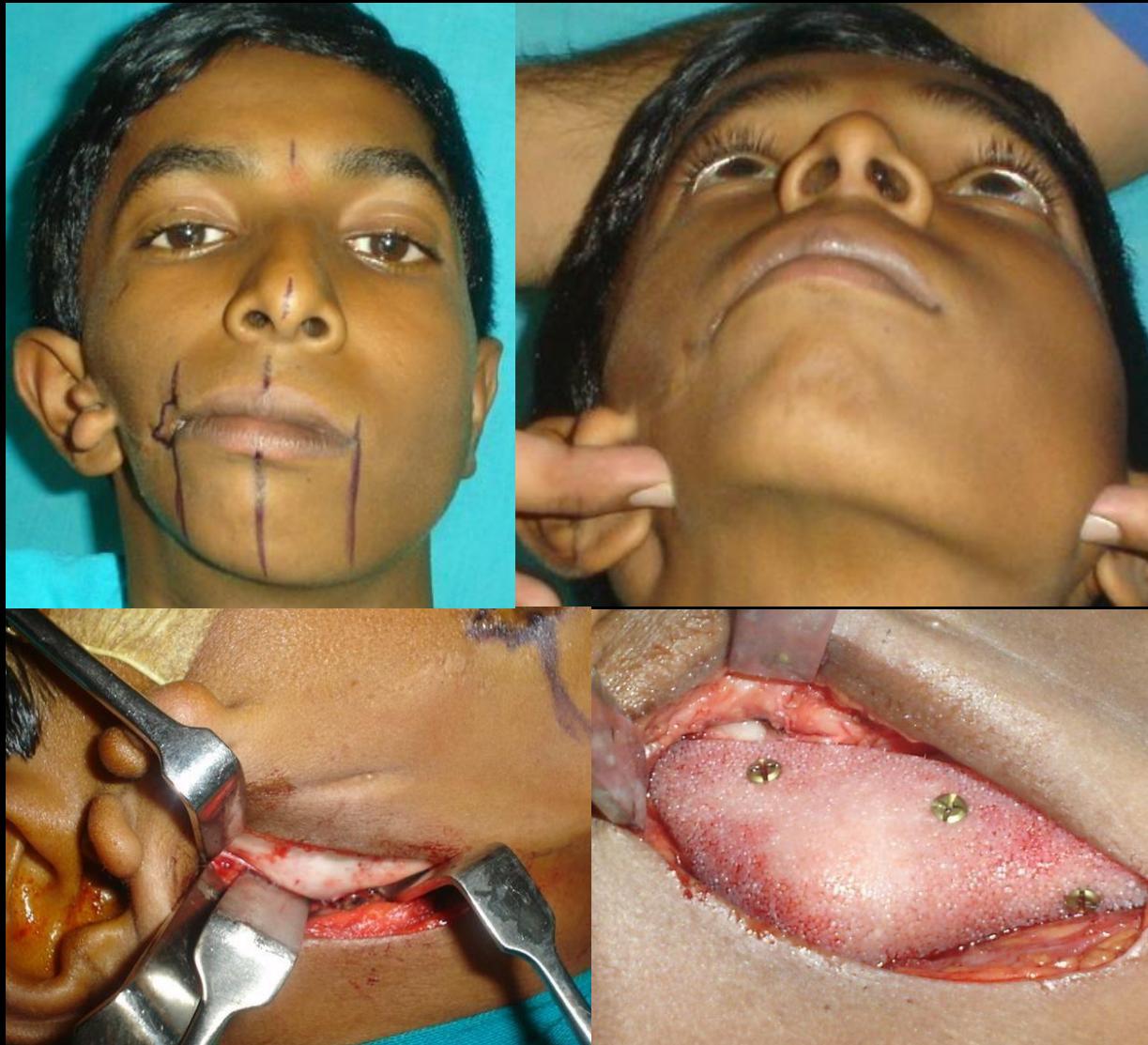


Type II b HFM



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Type II b HFM Surgery



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Type II b HFM After

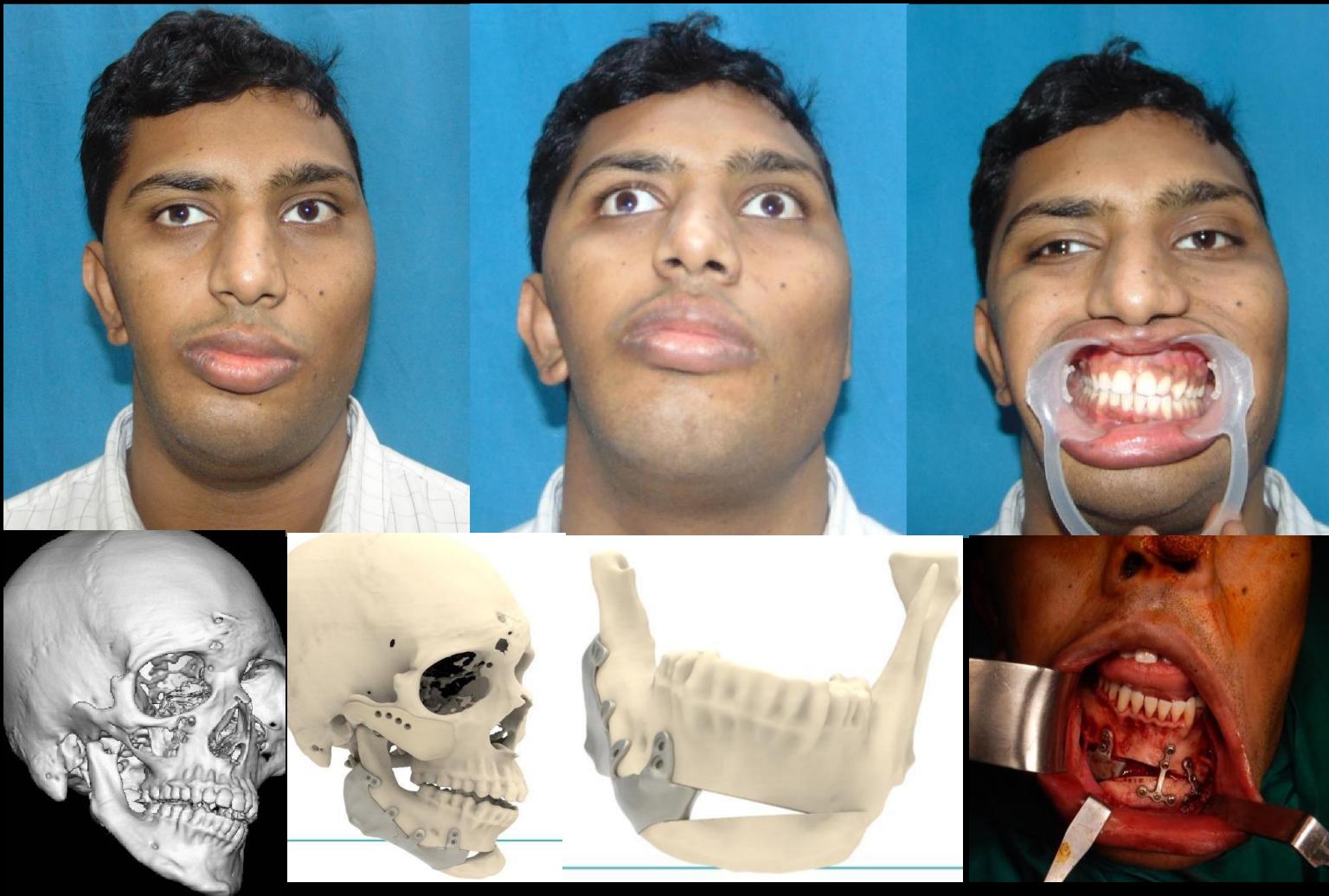
Surgery



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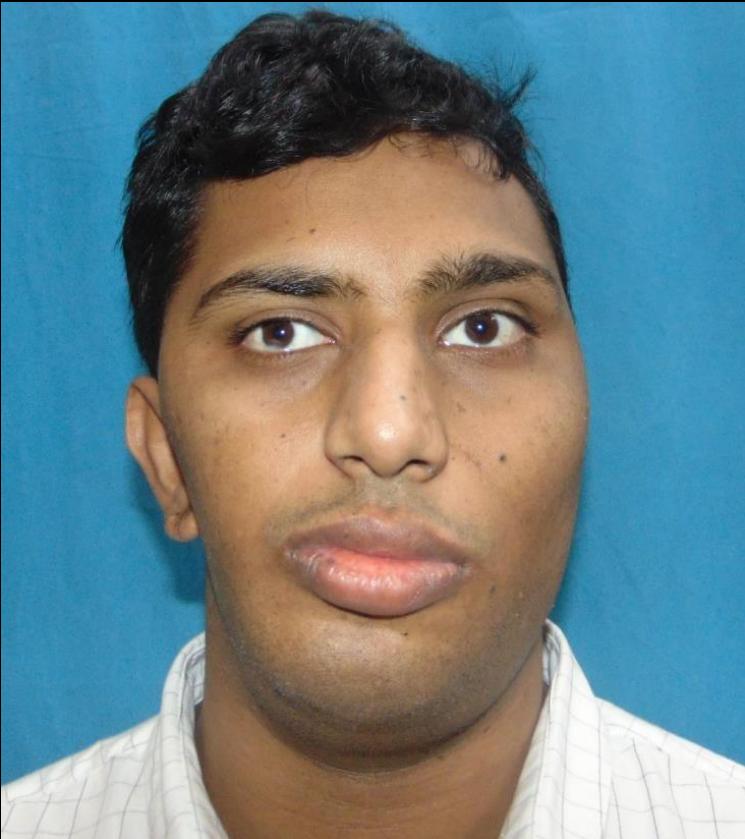
Type II b HFM

Surgery



Type II b HFM

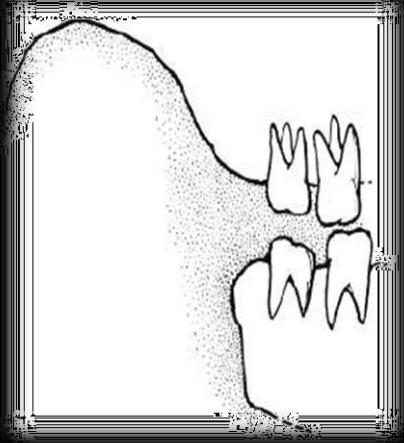
Pre-Op



Post-Op

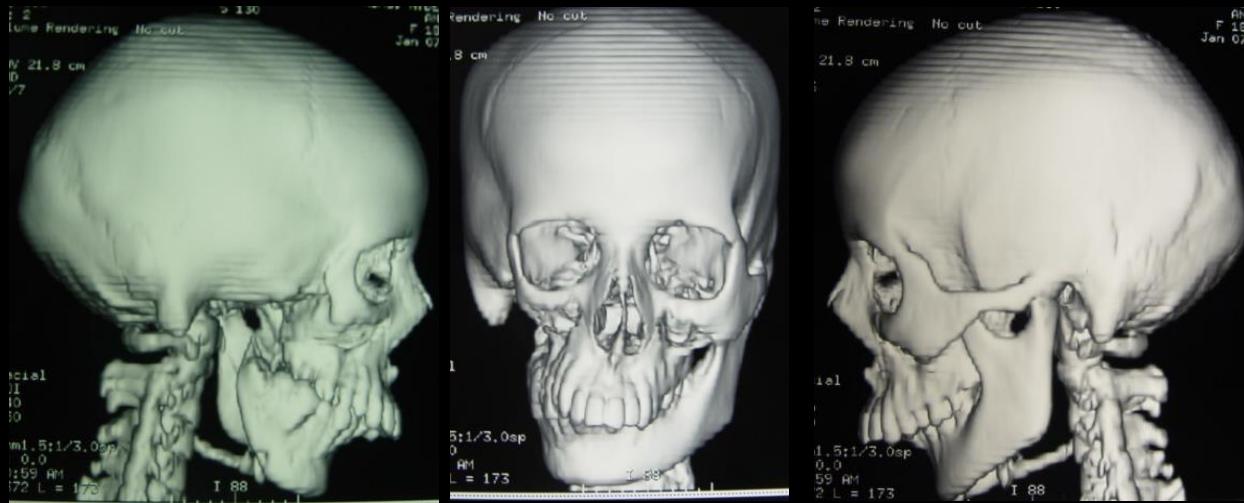


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Clinical Features

Type III



Condylar Hyperplasia (CH)

- Post natal cause of facial asymmetry
- CH involves unilateral condylar growth, which may affect just the condyle, condyle with ramus or the whole hemi- mandible
- Can be
 - Hemi mandibular elongation – isolated elongation of condyle
 - Hemi mandibular hyperplasia – total hyperplasia of condyle, condylar neck and the ascending ramus.

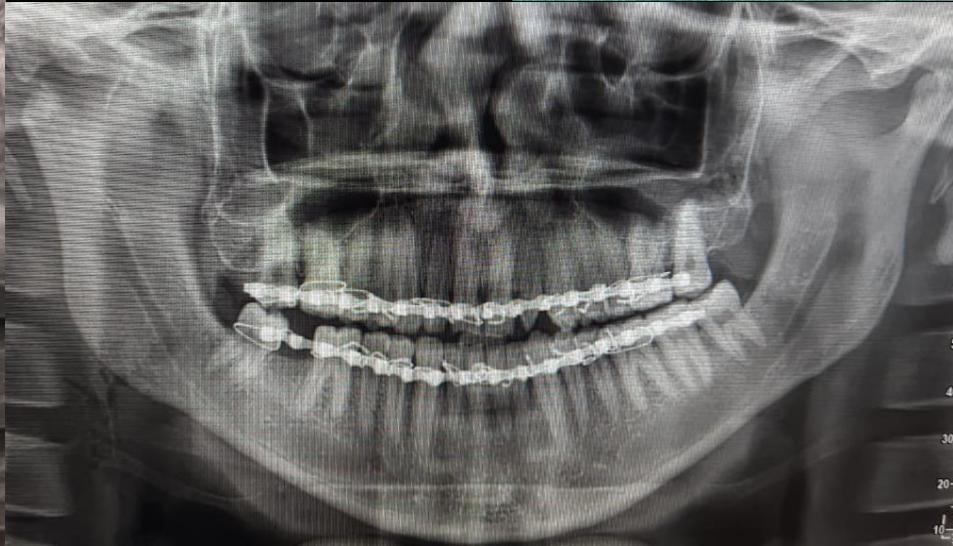


- Management

- Depends upon the clinical presentation.
- If the condition is **quiescent**, it can be treated as an end stage deformity with **conventional orthodontics and orthognathic surgery**
- If condition is **active**, **high condylectomy with orthognathic surgery** may be needed.
Hyperplastic portion of condyle is resected, and apparent normal condyle is left in place.
- Unilateral **CH** can be treated with **unilateral ramus osteotomies** of the affected side.

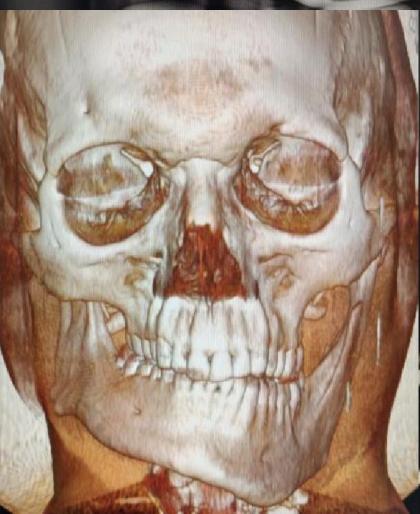


Pre op – Intra Op - Post op



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Pre op – Post Op



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Hemifacial Hypertrophy



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6 Months Post -Op

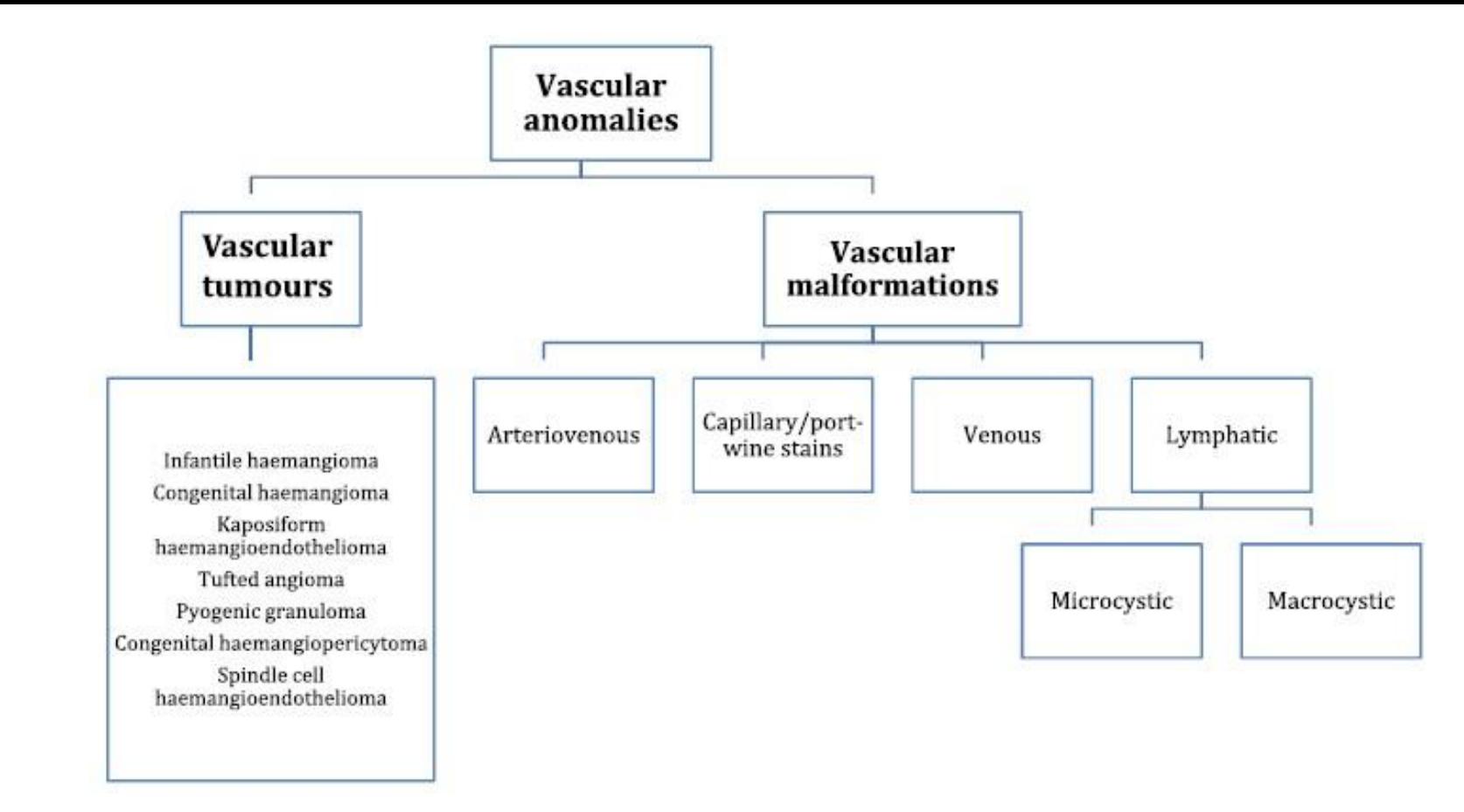


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VASCULAR MALFORMATIONS



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The modified classification of Mulliken and Glowacki

Fowell C, et al. Infantile haemangiomas of the head and neck: current concepts in management. Br J Oral Maxillofac Surg (2016),



Vascular malformation based on anatomical presentation.

Type I – Mucosal/cutaneous

Type II – Submucosal/subcutaneous

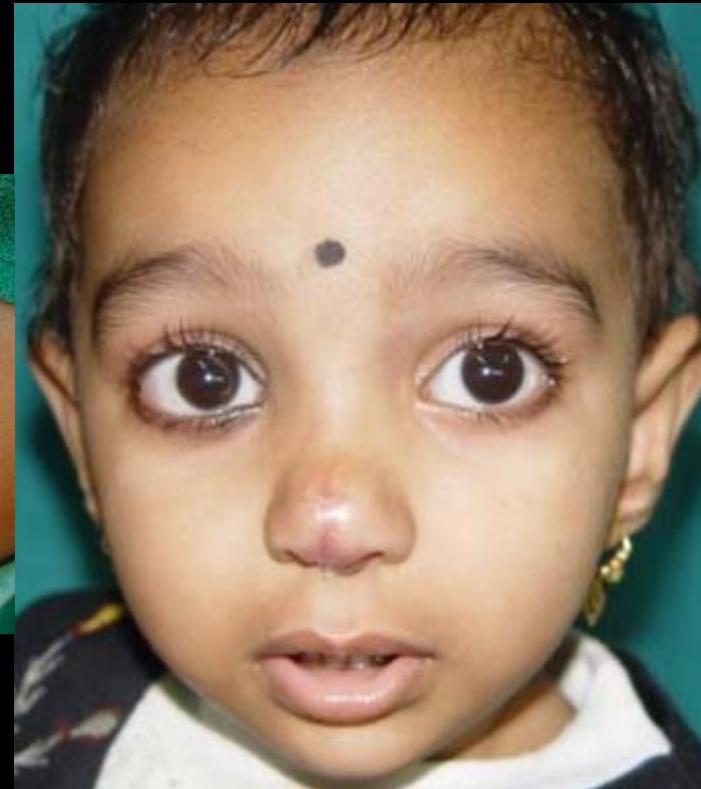
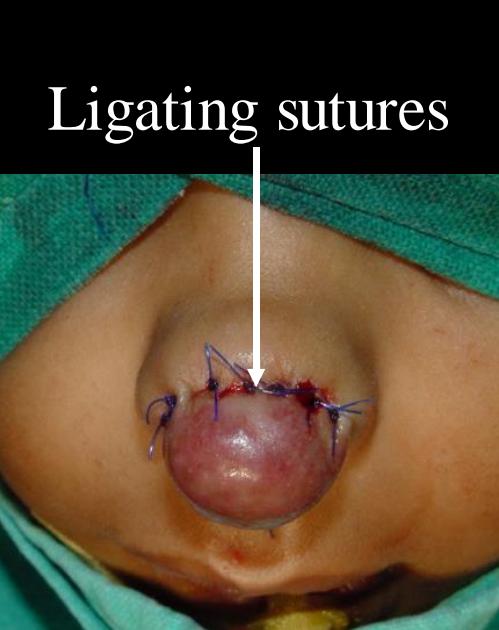
Type III – Glandular

Type IV – Intraosseous

Type V – Deep visceral

Nair SC, Spencer NJ, Nayak KP, Balasubramaniam K. Surgical management of vascular lesions of the head and neck: a review of 115 cases. Int J Oral Maxillofac Surg. 2011 Jun;40(6):577-83





Capillary Hemangioma



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Treatment...



Hypertrophied Capillary Malformation

Treatment with full thickness skin graft harvested from right groin



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Treatment...

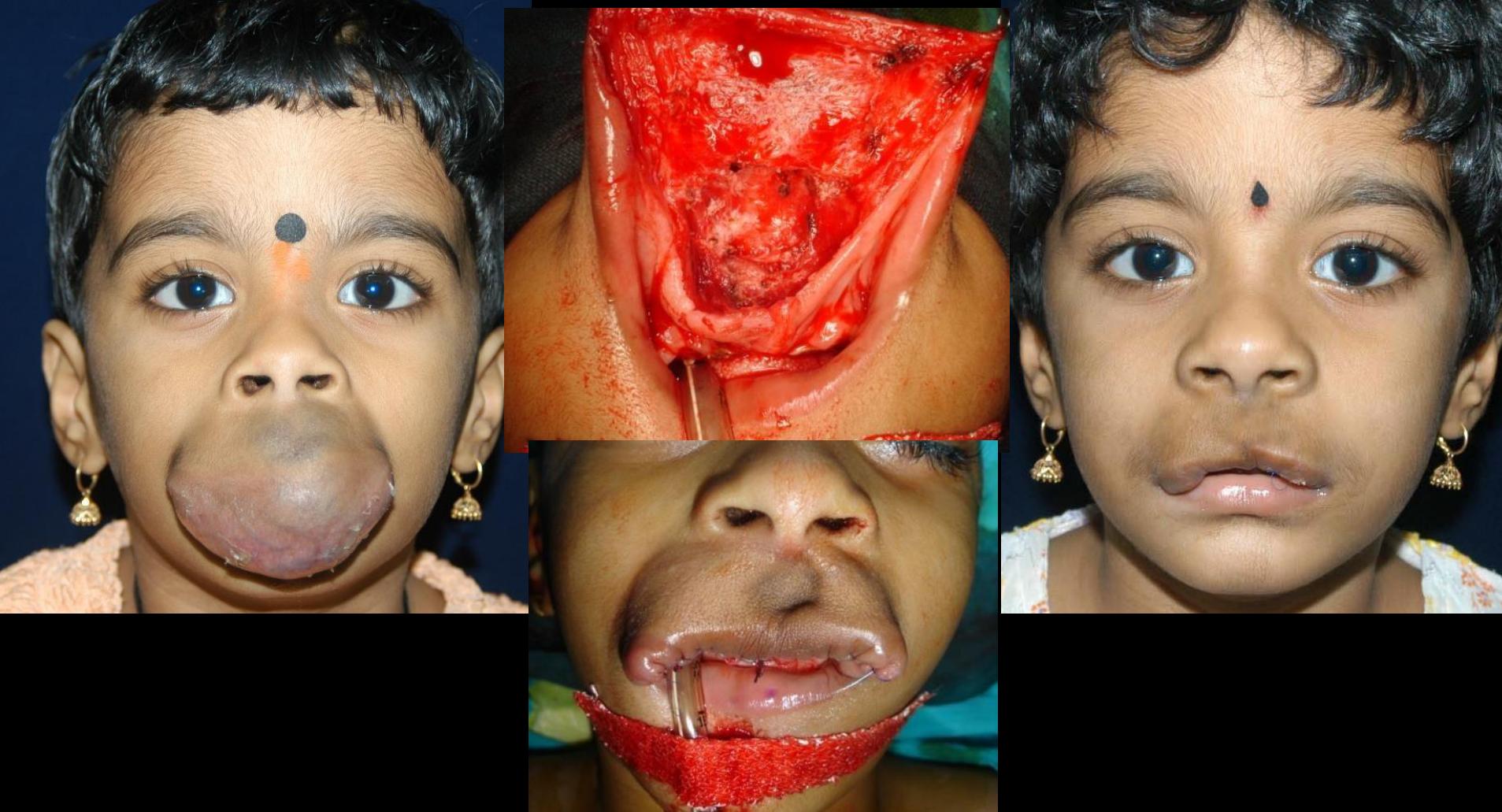


Low Flow Venous Malformation



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Treatment...



High Flow Venous Malformation



Treatment...



Lymphatic Malformation

Surgery is only performed as a cosmetic adjuvant to other therapies.

Macrocystic lymphatic malformations are treated with drainage and ethanol injections as a sclerosing agent.

Microcystic lymphatic malformations are treated with doxycycline injections as sclerosing agent



Treatment...



High Flow A-V Malformation



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Treatment...



High Flow A-V Malformation



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Treatment...



Sturge Weber Syndrome



Treatment...



Sturge Weber Syndrome



Viva Voce

- Classification of Vascular Malformations
- Differentiation between Hemangioma and AV Malformation ?
- Indications of Distraction Osteogenesis
- Diagnosis of Facial Asymmetry



Bring the Smile Back



Thank You



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