Management of the Cleft Maxilla

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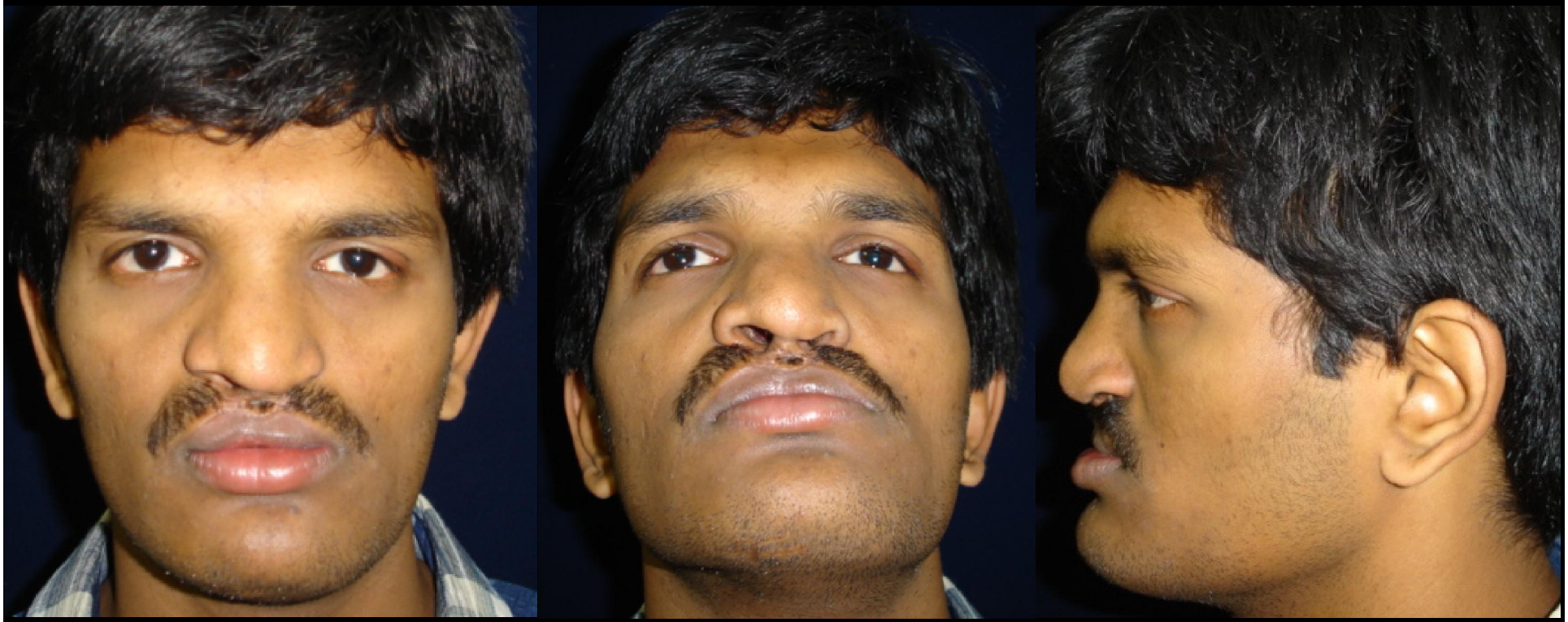
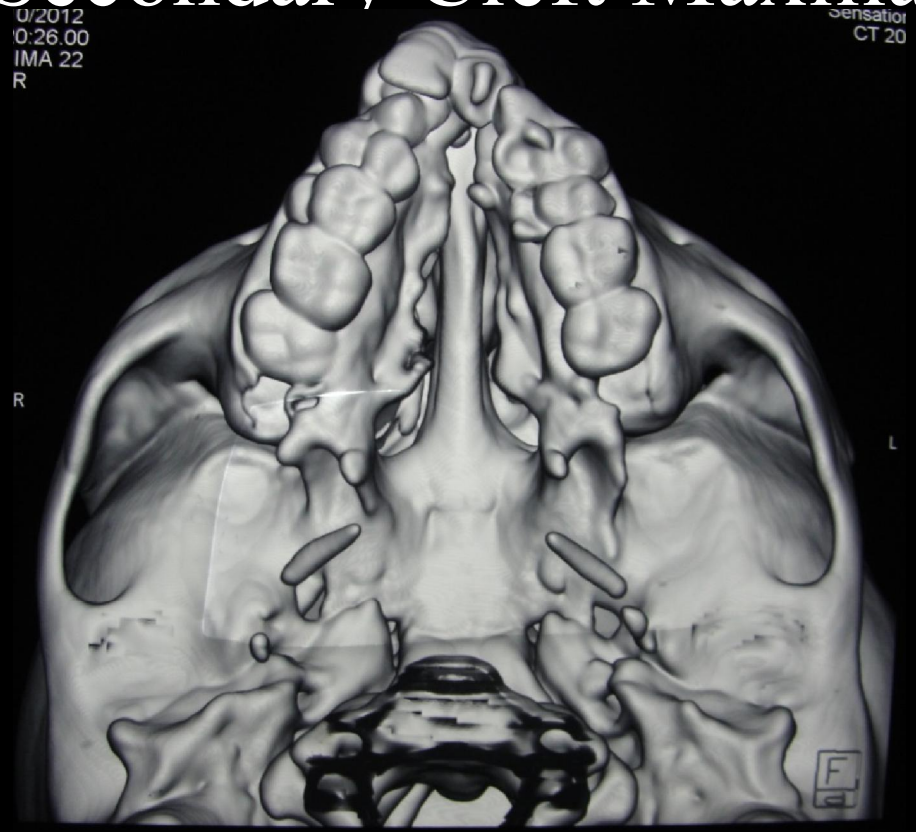
Secondary Cleft Maxilla



Secondary Cleft Maxilla

Any surgery to the lip and palate causes growth discrepancies.

Secondary Cleft Maxilla



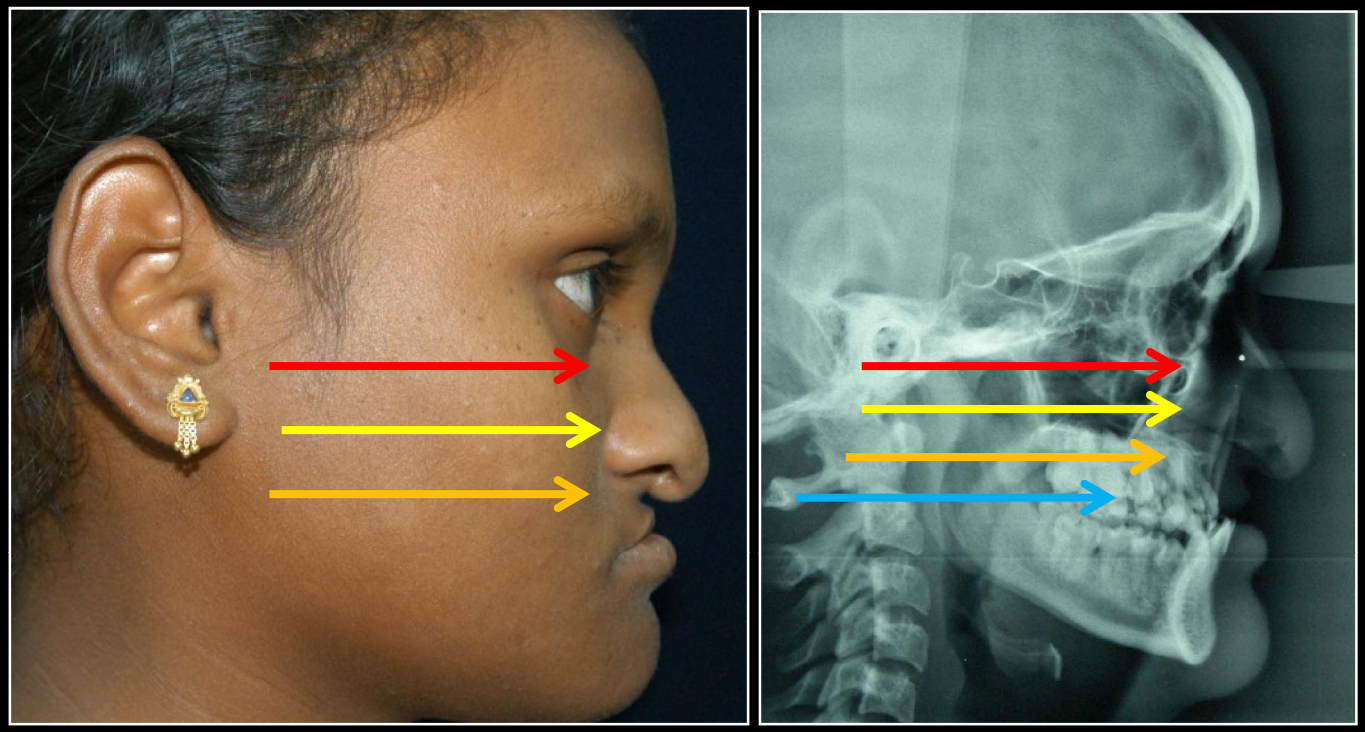
Scar

- Scar in the midline of the palate extends not only antero-posteriorly but also superiorly

Skeletal Considerations

- Loss of the bony support anteriorly in the cleft alveolus and medially in the cleft maxilla.

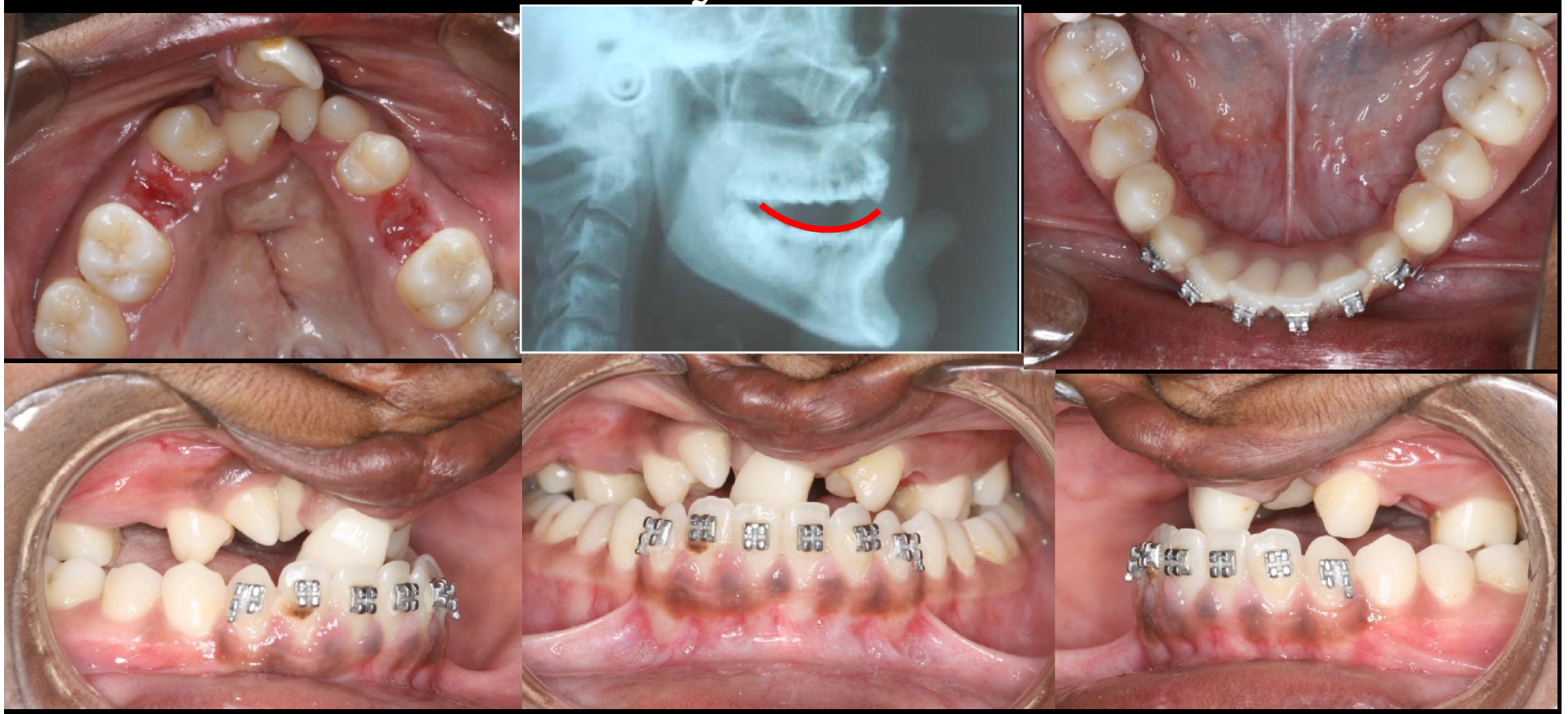
Secondary Cleft Maxilla



Skeletal Considerations

- Midfacial Skeletal Hypoplasia
  - Infraorbital
  - Nasolabial
  - Maxilla
  - Dentoalveolar

Secondary Cleft Maxilla



Occlusion

- Complete loss of occlusion due to 3-dimensional maxillary constriction
- Exagerated Curve of Spee

Principles of Correcting Secondary Cleft Maxilla

Orthodontic:

1. Increase transverse dimension by bi-phasic expansion
2. Reposition teeth in the upper arch to obtain good arch form - Decompensation
3. Retain gaps in the jaws where missing teeth should have erupted
4. Correct the curve of spee

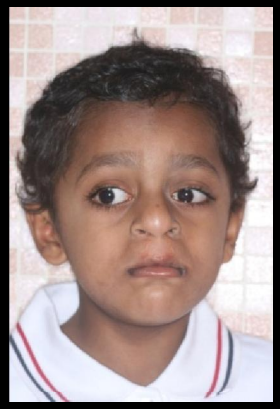
Surgical:

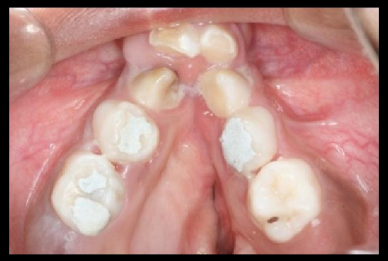
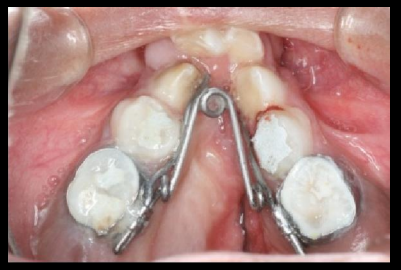
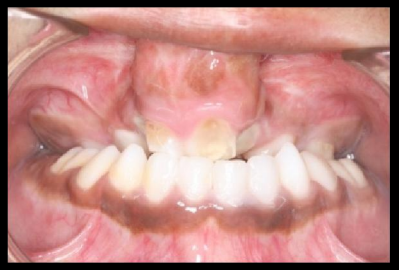
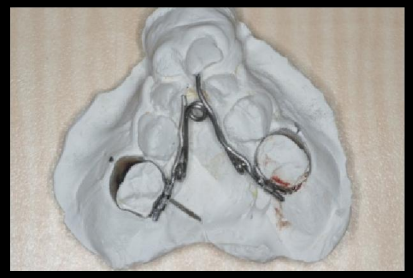
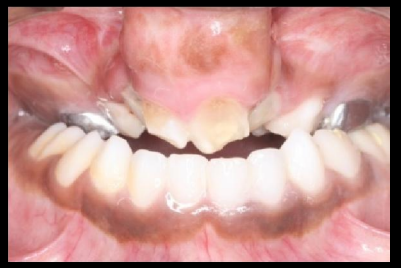
1. Restore horizontal and vertical dimension of lip
2. Bone grafting and palatal fistula closure
3. Midfacial Advancement (Orthognathic surgery or Distraction)
4. Septo-rhinoplasty

Secondary Cleft Maxilla Orthodontics

Orthodontic Procedure in Mixed Dentition

Increase transverse dimension by palatal expansion:
Quad Helix

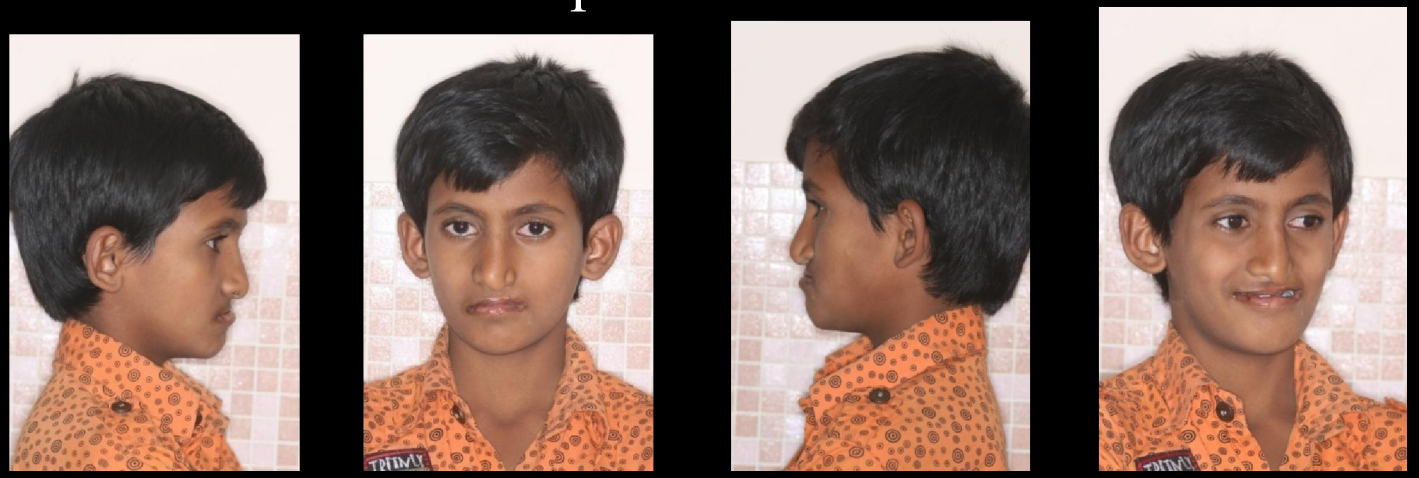



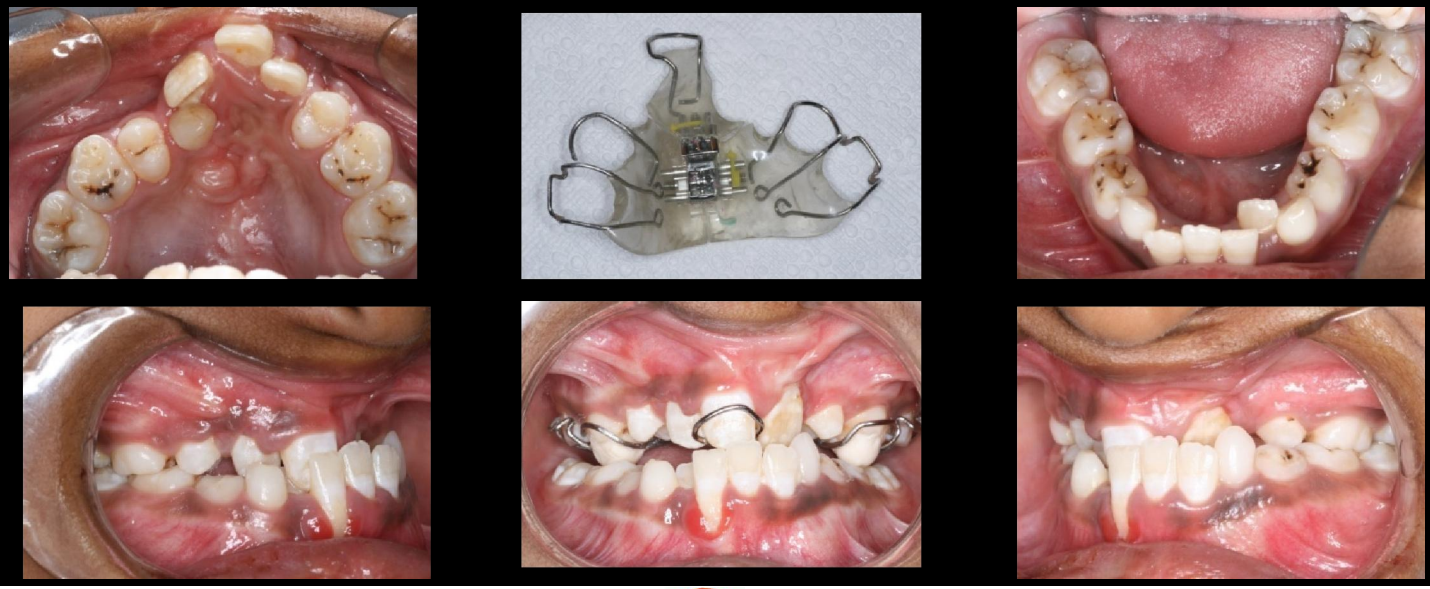






Orthodontic Procedure in Mixed Dentition

Increase transverse dimension by palatal expansion:

2D Expansion Device





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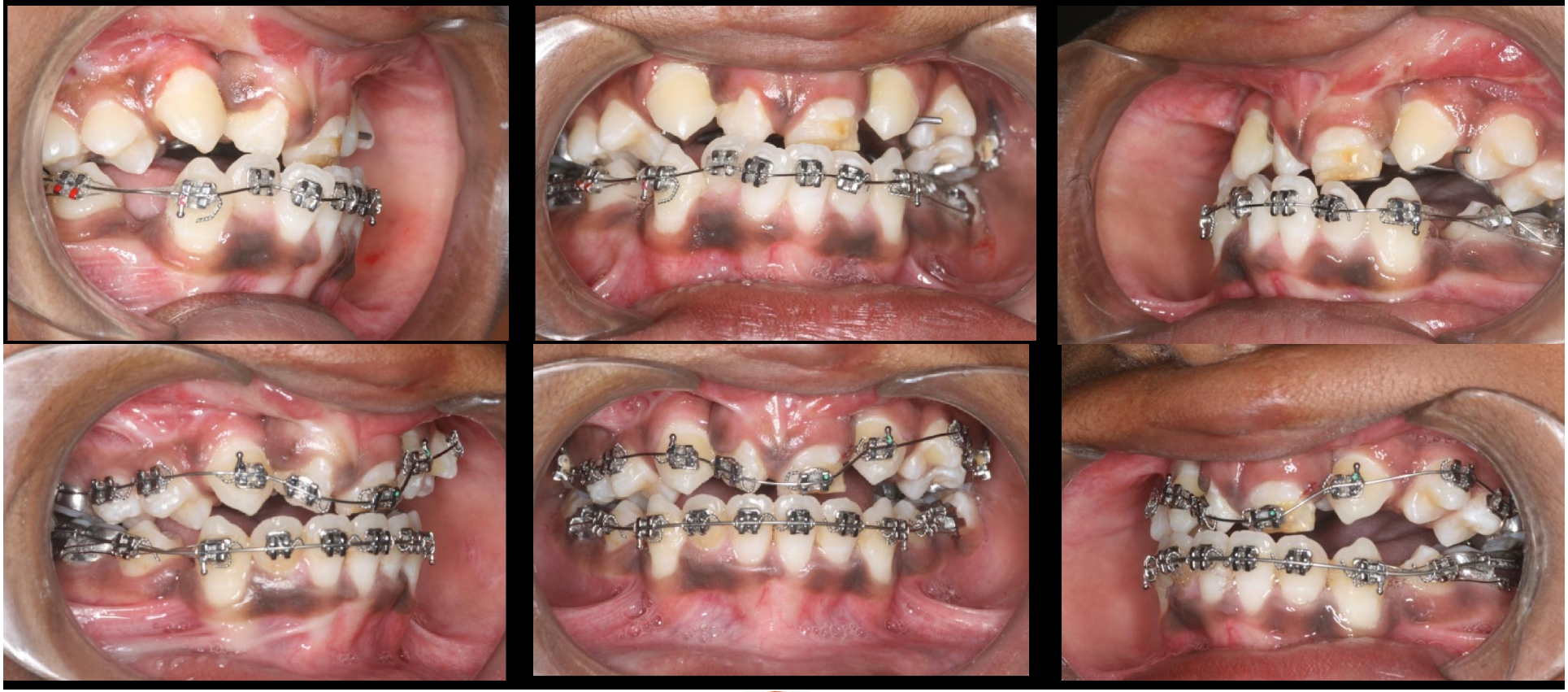
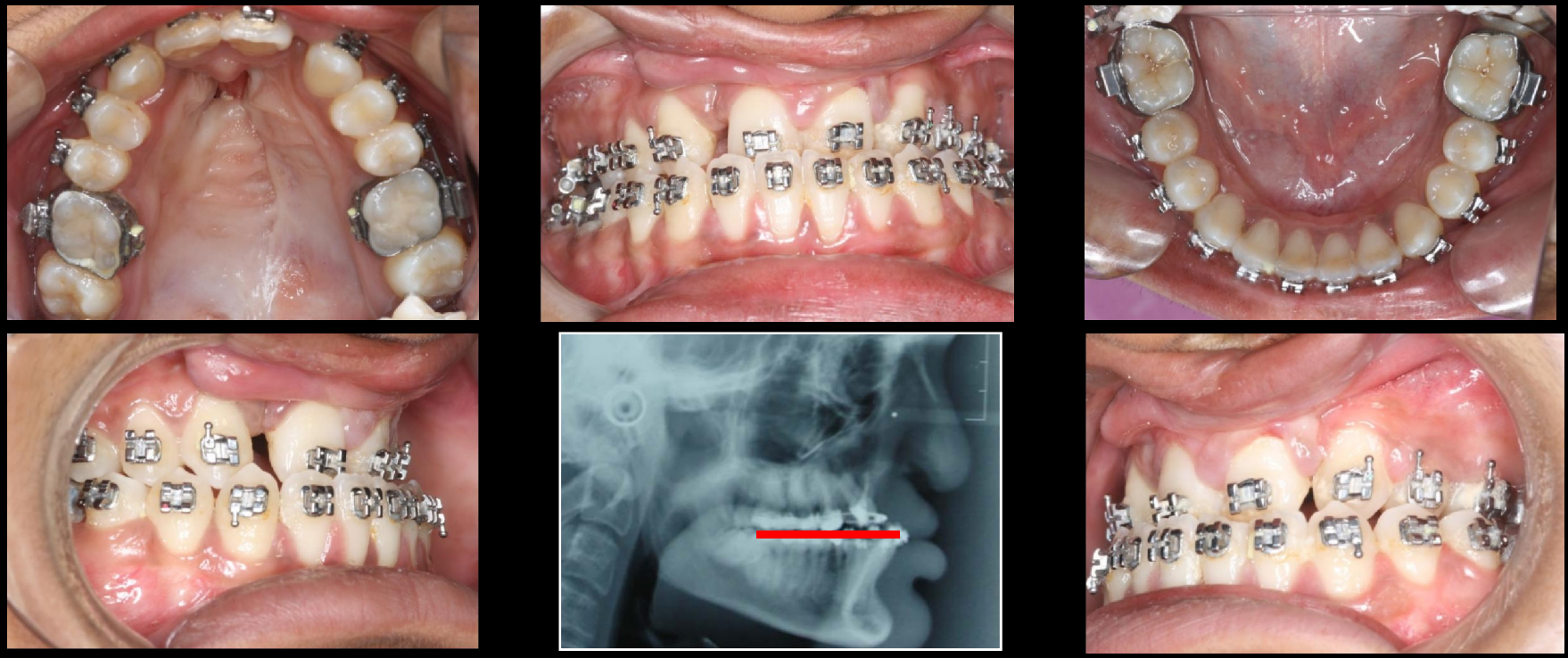
Orthodontic Procedure in Permanent Dentition
Banding, Brackets and Archwire

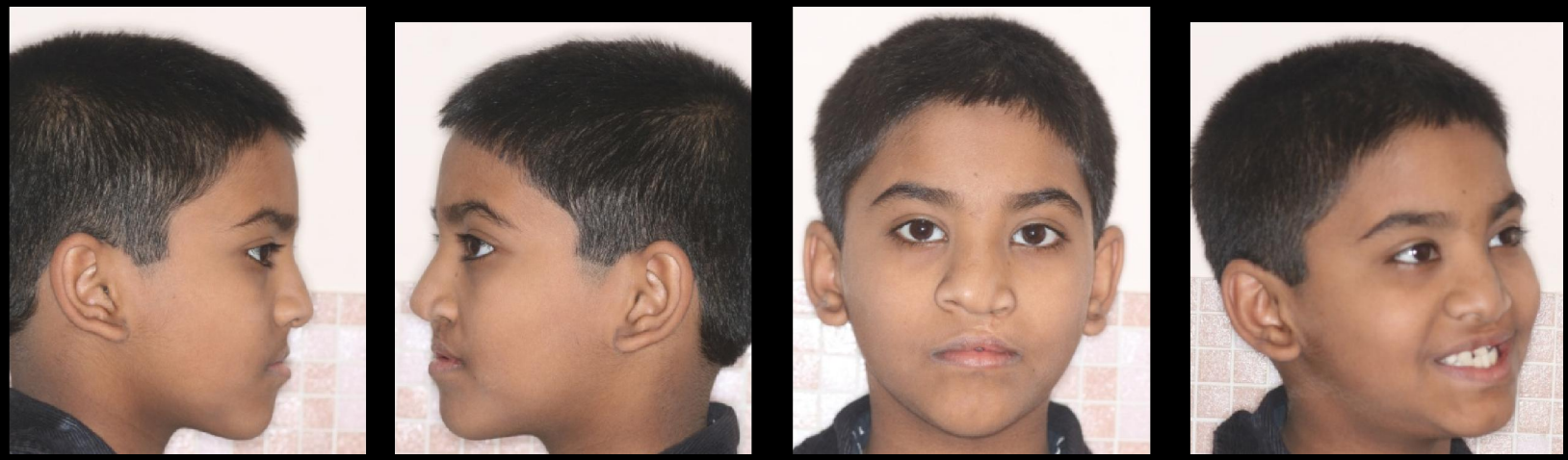
1. Use aligned lower jaw as a template to align maxillary arch
2. Align maxillary arch
3. Biphasic Expansion (Dentoalveolar and palatal expansion)

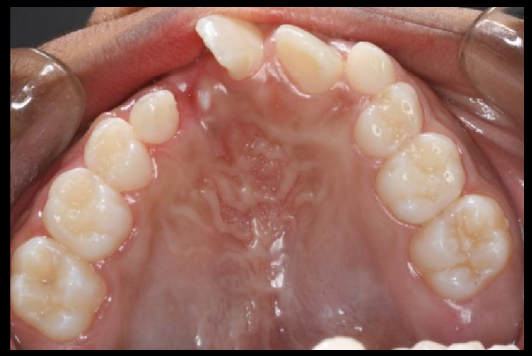


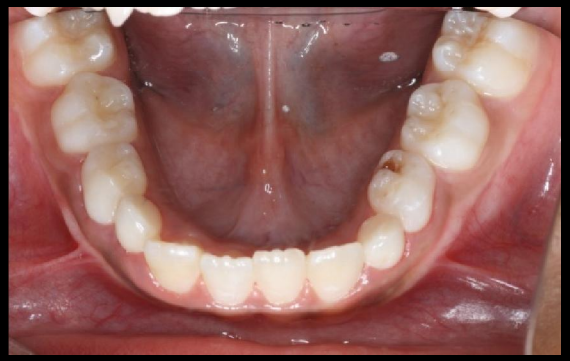
Orthodontic Procedure: Arch form

- Reposition teeth in the upper arch to obtain good arch form
- Retain gaps in the jaws where missing teeth should have erupted
- Correct the Curve of Spee

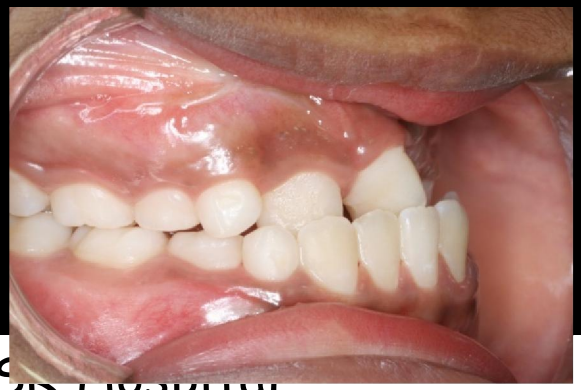


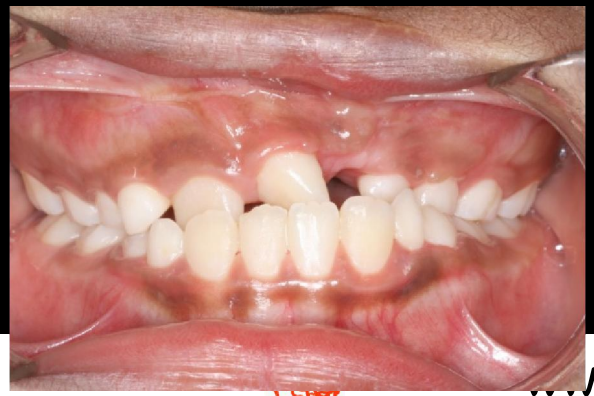


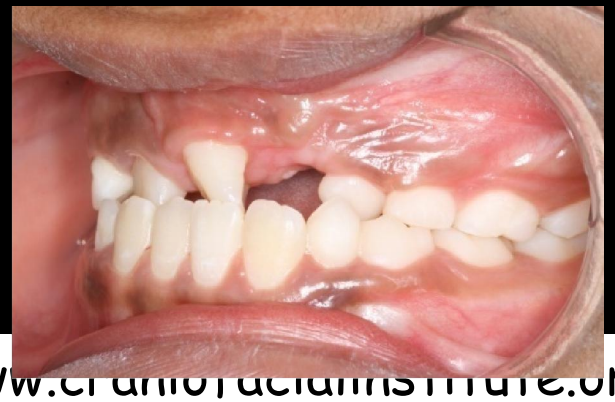


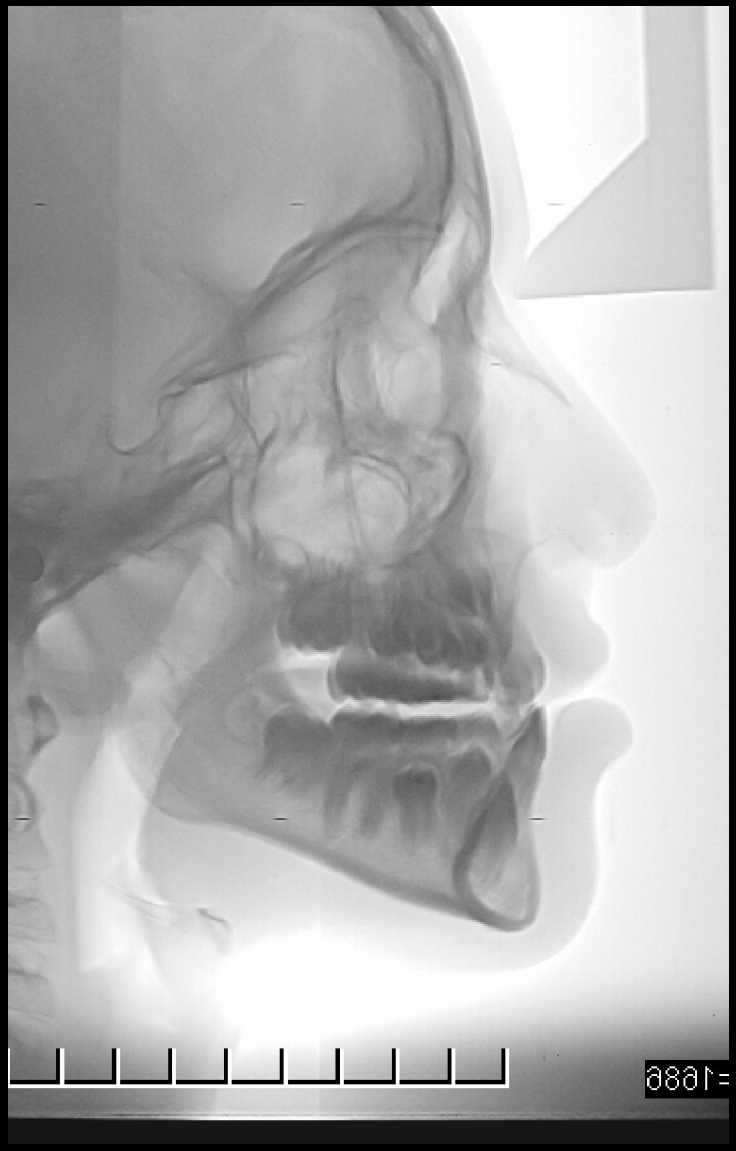


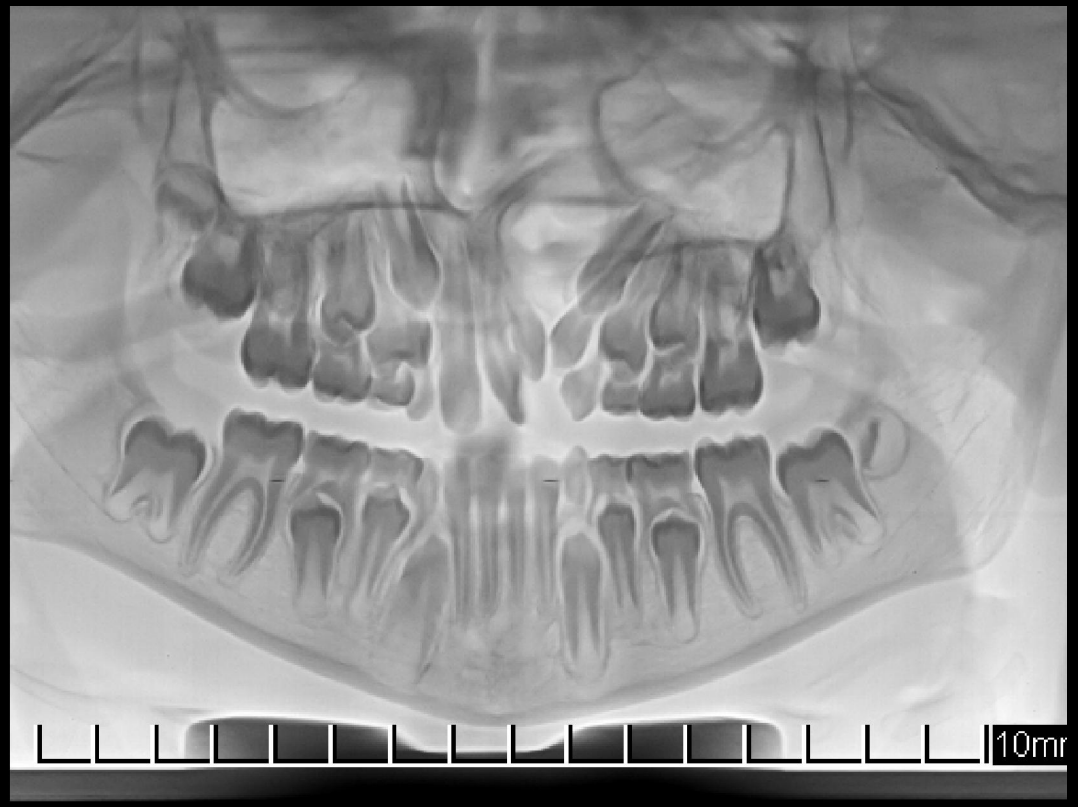
Ritesh 10yrs/M
pre treatment, 10-03-10



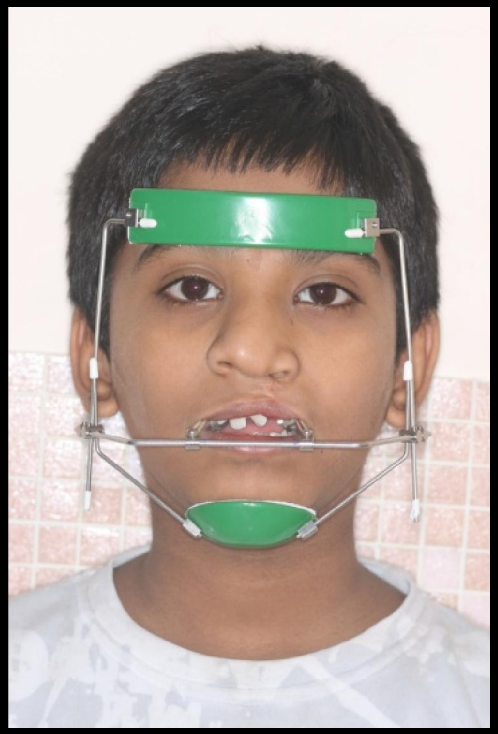






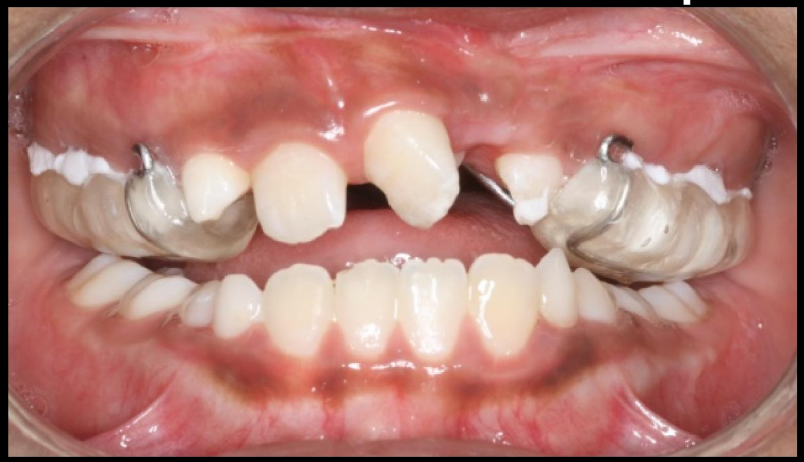


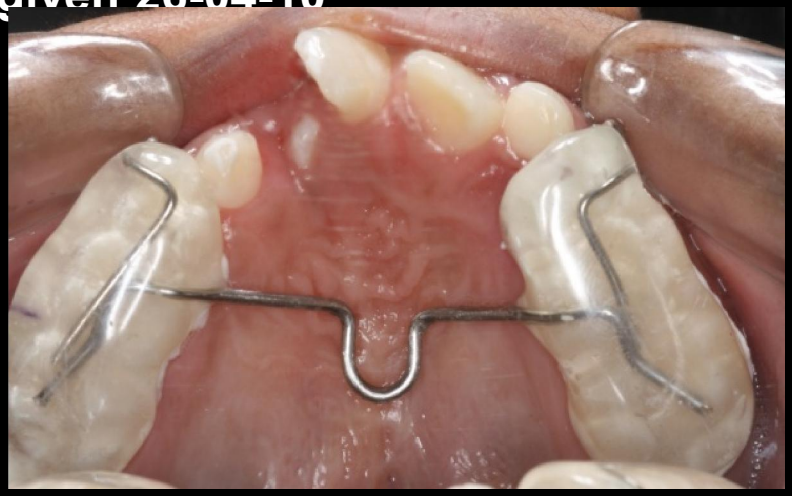
Ritesh 10yrs/M
pre treatment, 10-03-10

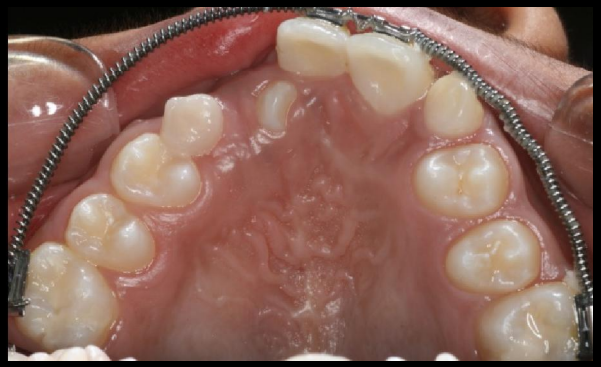


Ritesh reddy 10yrs/M

Reverspull head gear given 26-04-10







Ritesh reddy 10yrs/M
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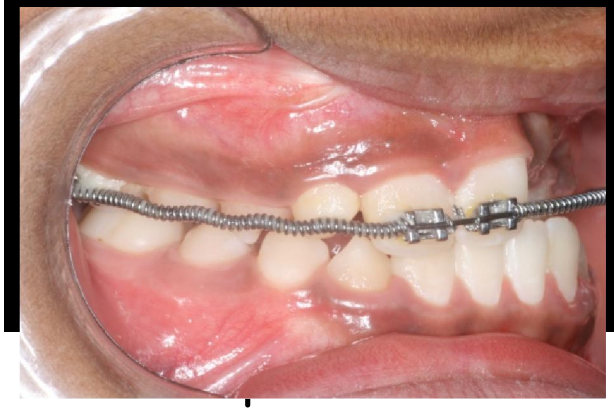

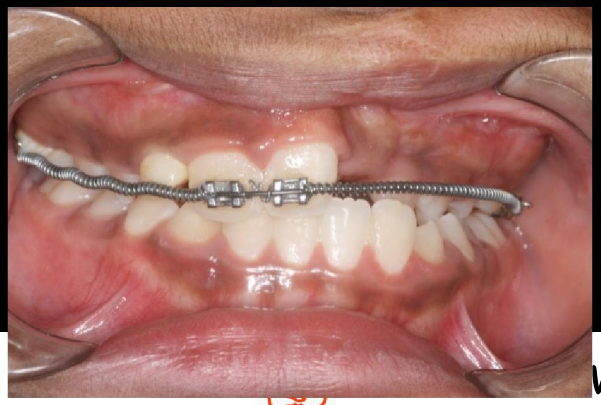

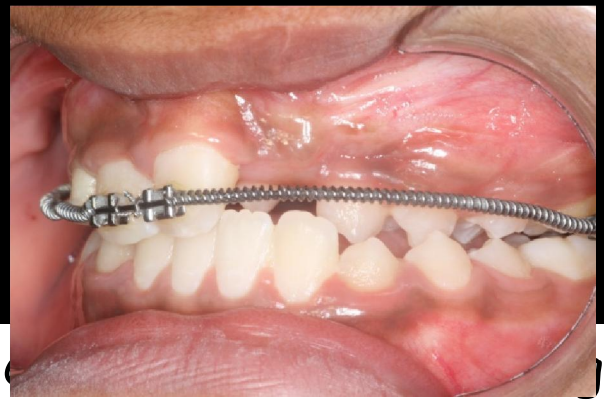

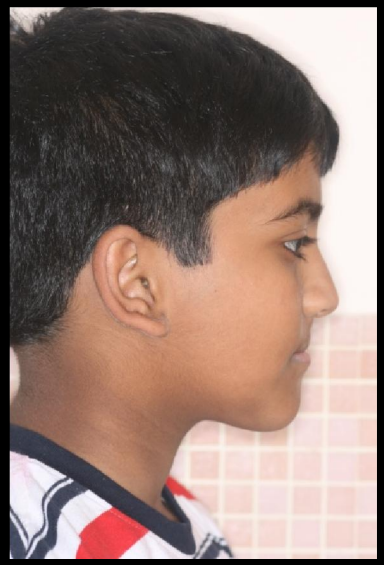

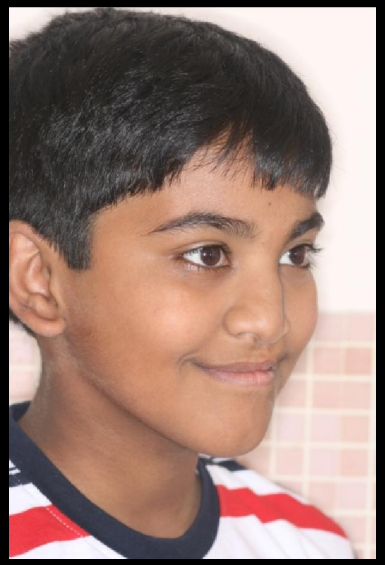

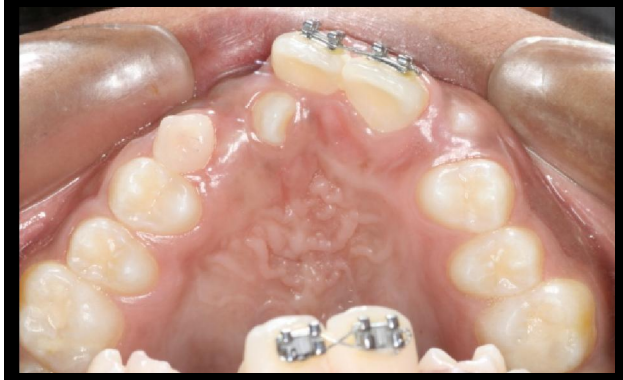

Ritesh reddy 10yrs/M
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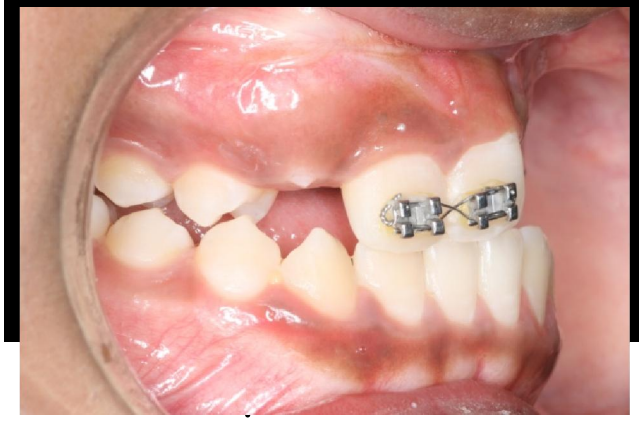

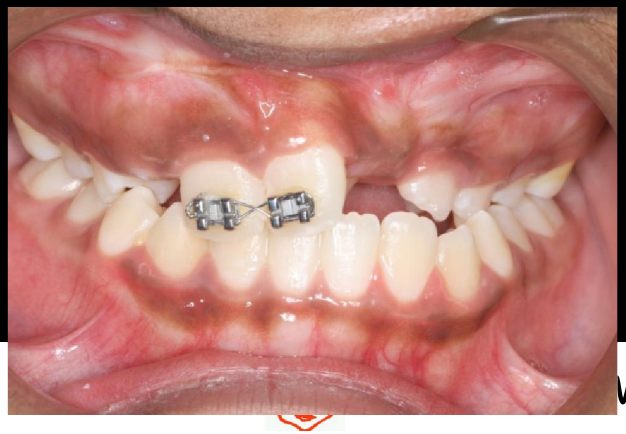

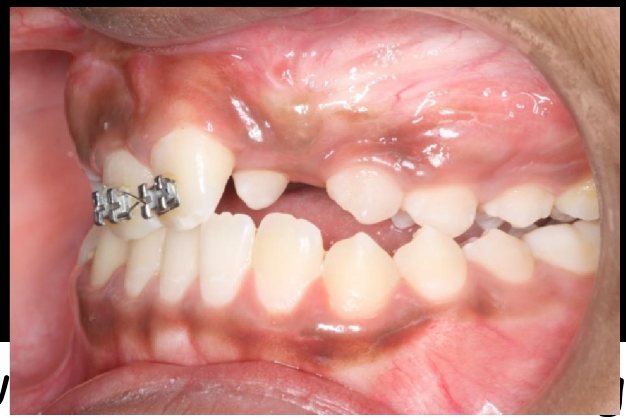

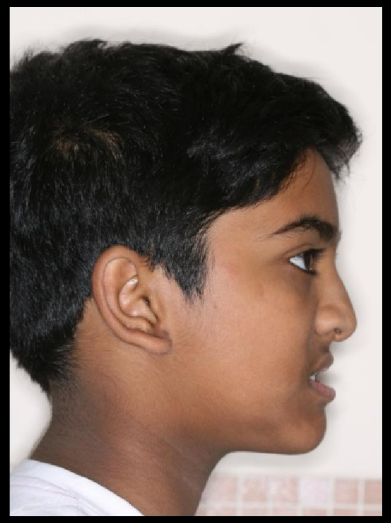


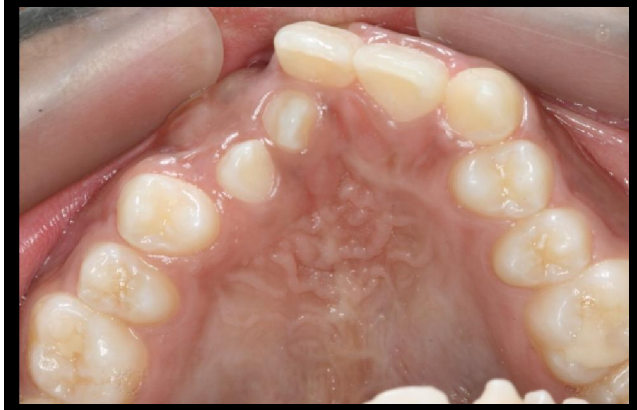

Ritesh reddy 11yrs/M
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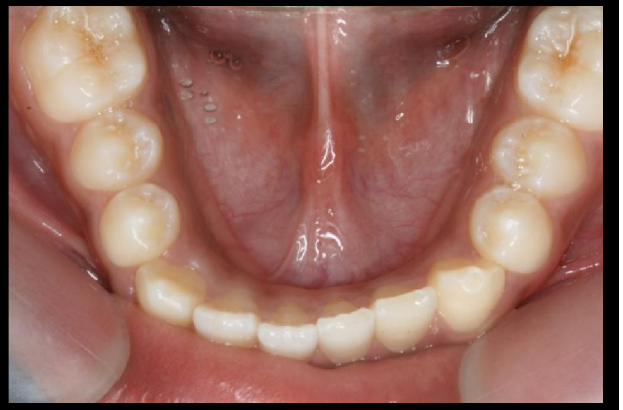
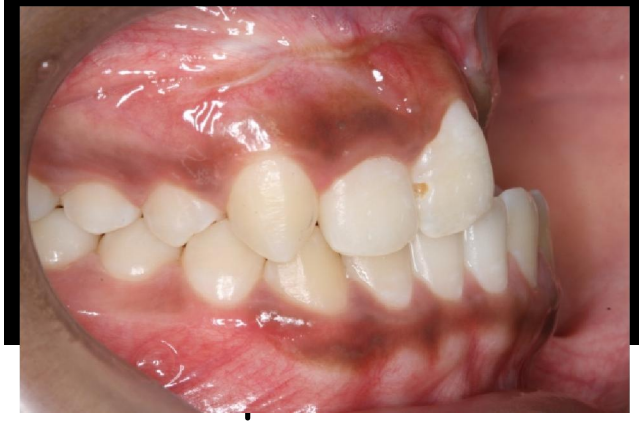
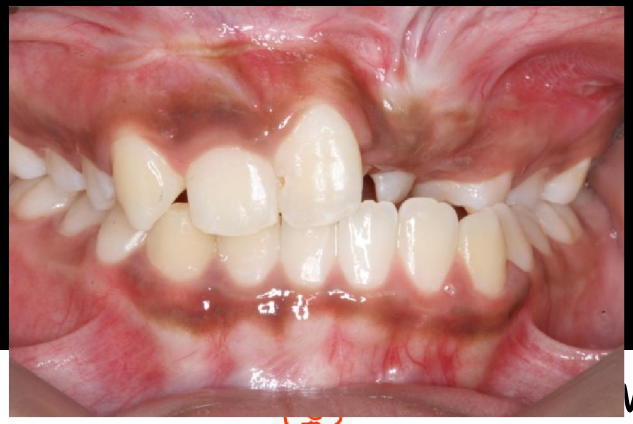
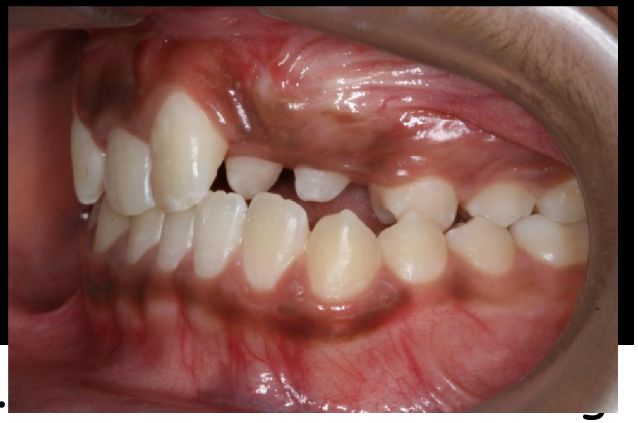
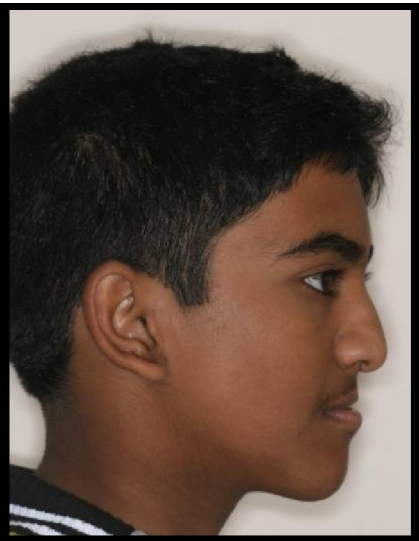
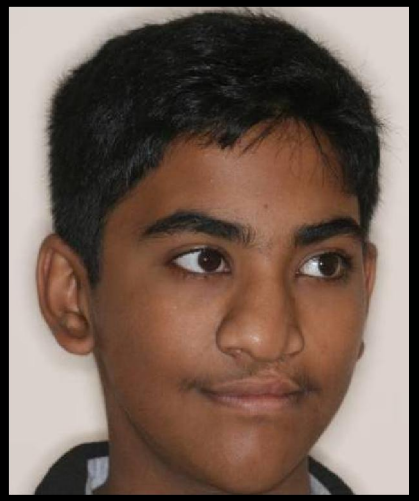
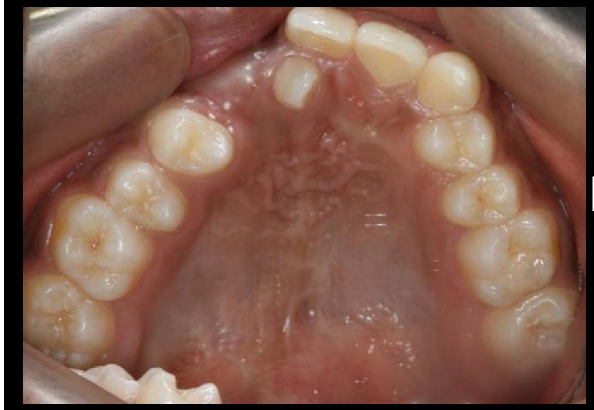
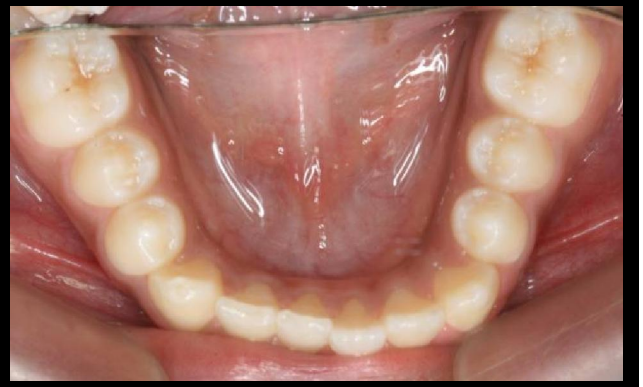





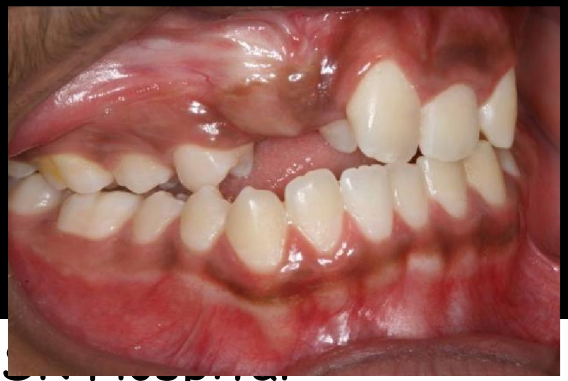


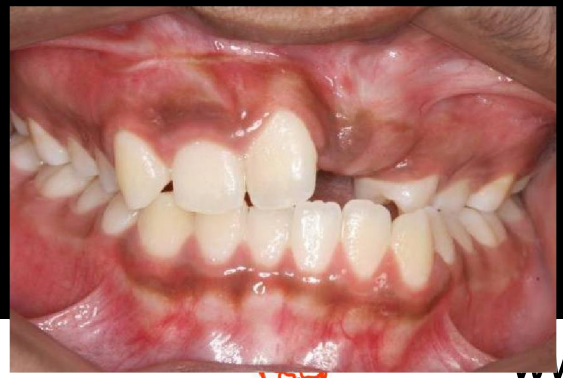


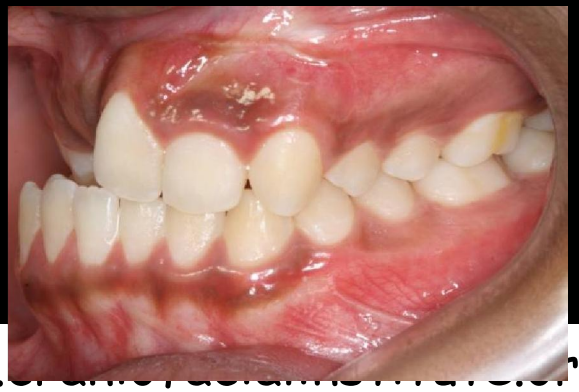


Ritesh reddy 13yrs/M,09-08-13









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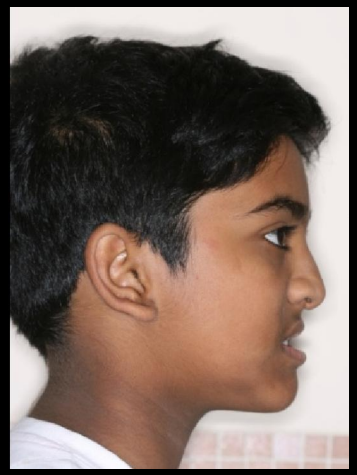

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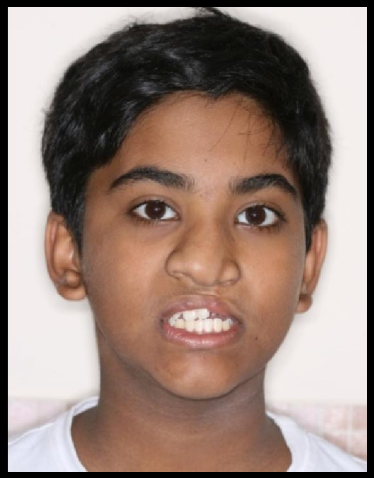

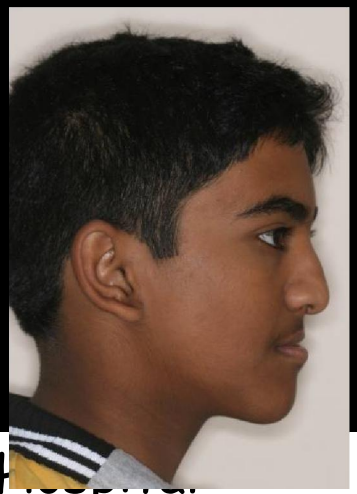

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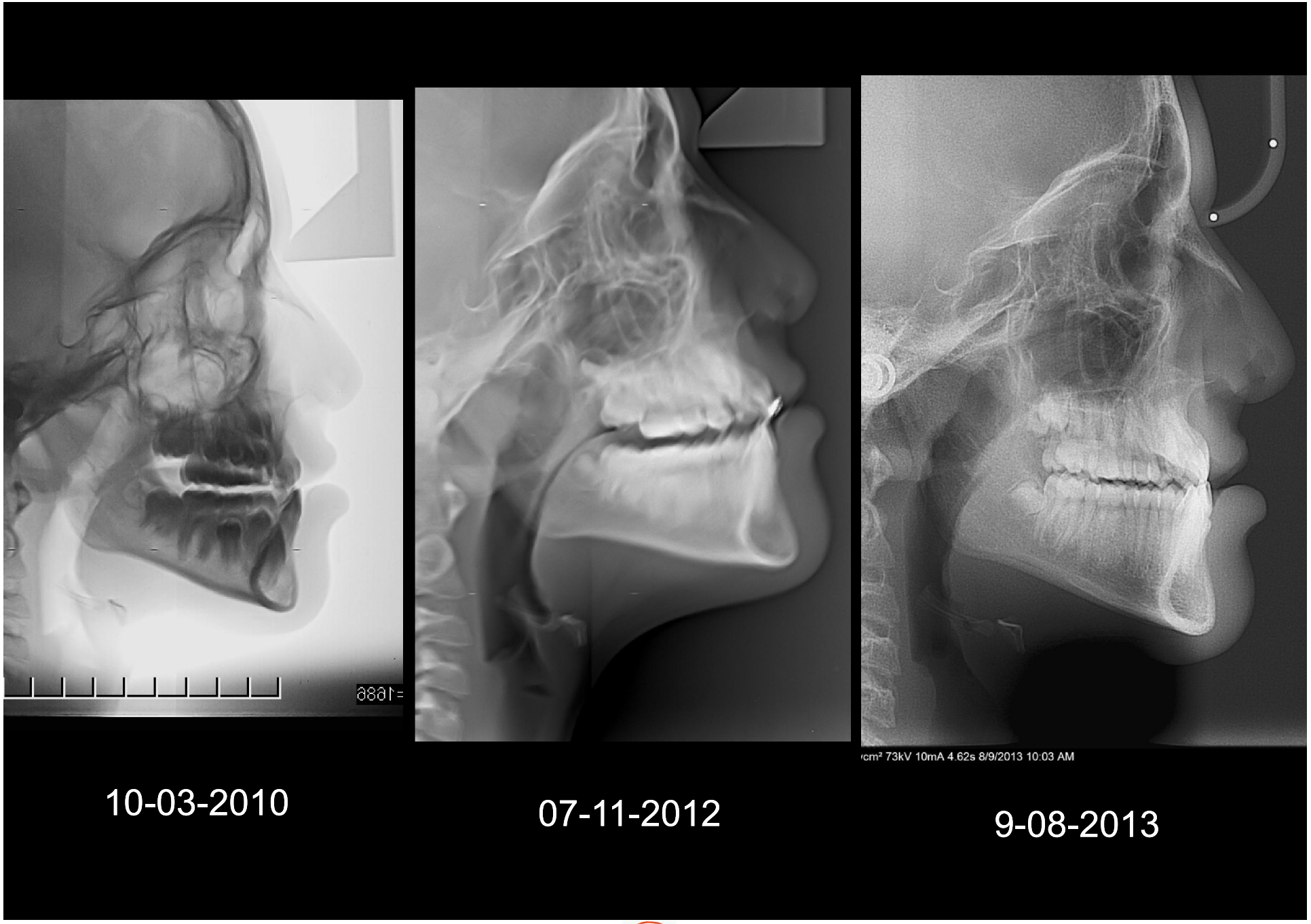

10-03-2010

07-11-2012

9-08-2013

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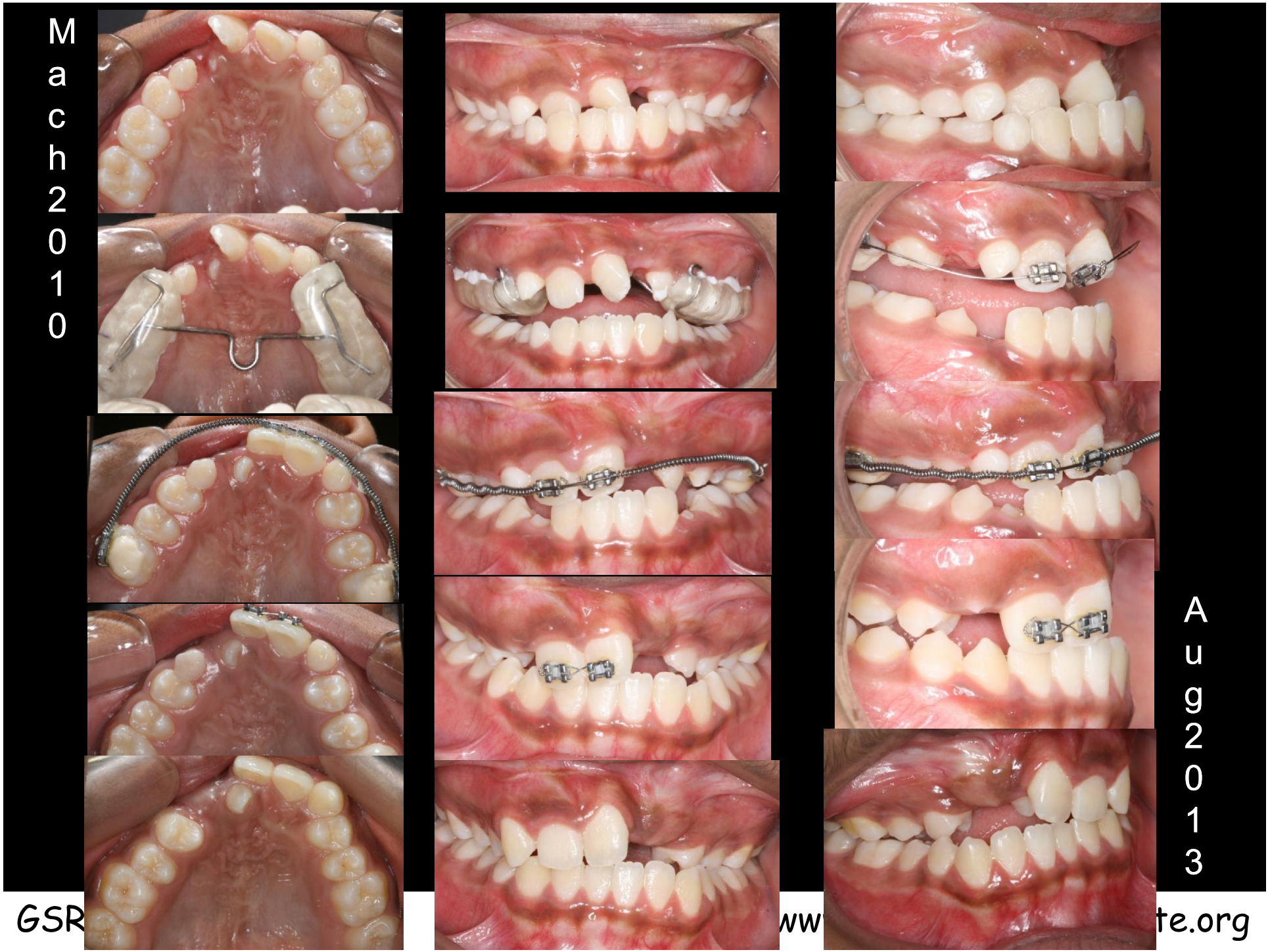
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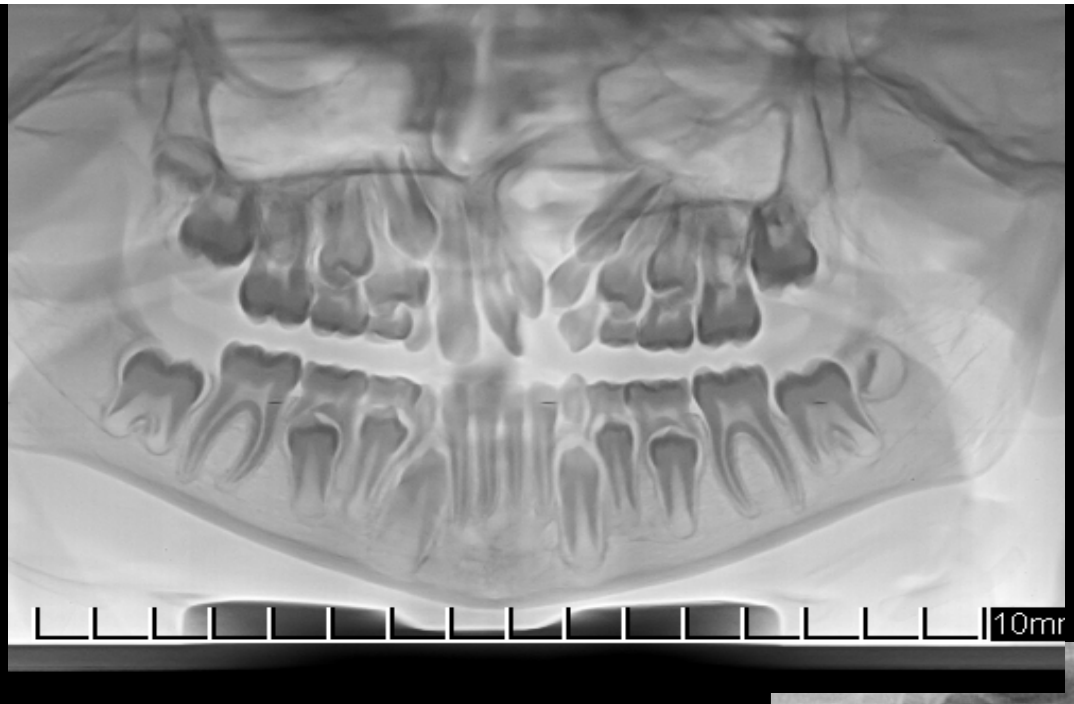

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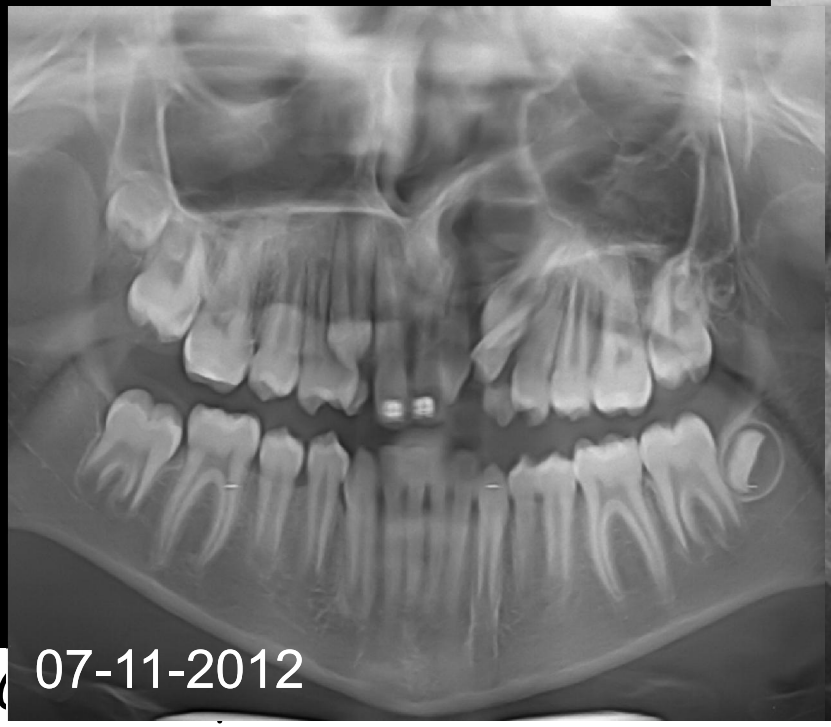

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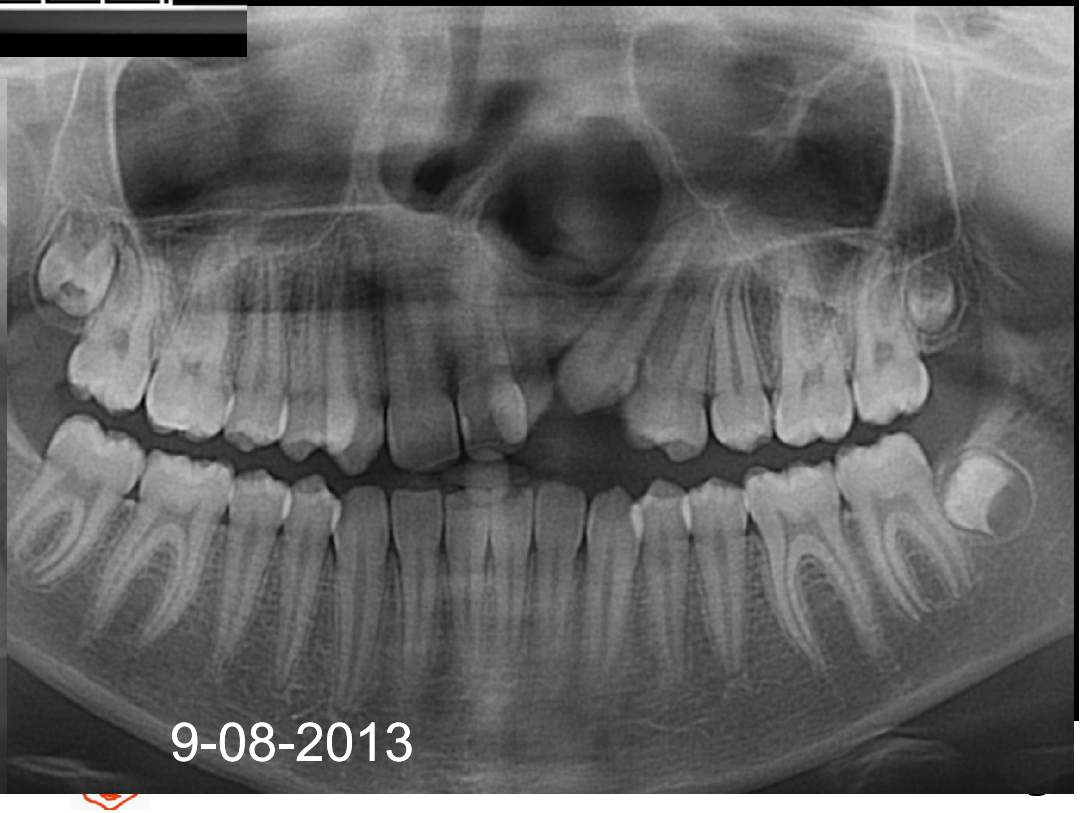
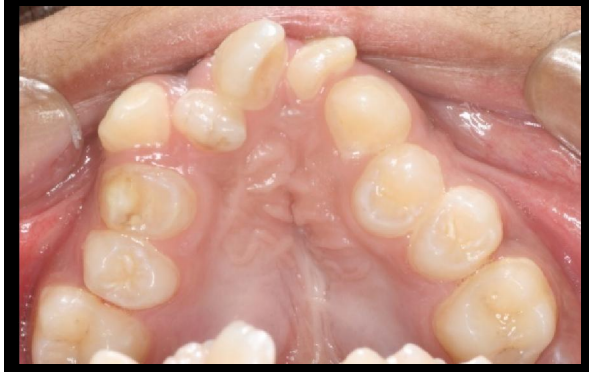


9-08-2013

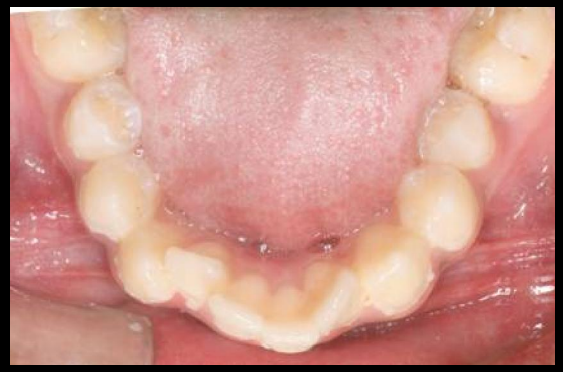
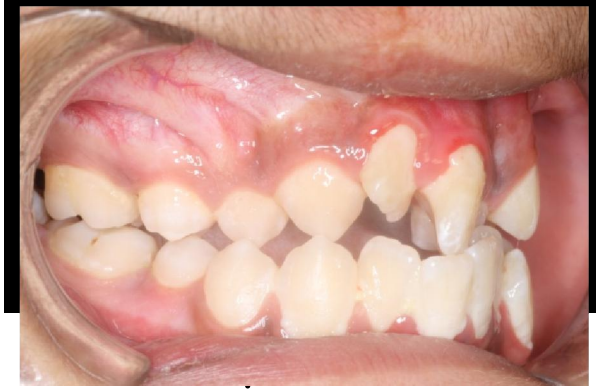
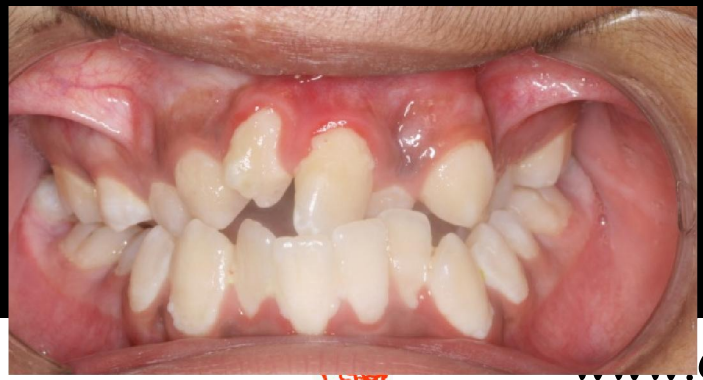
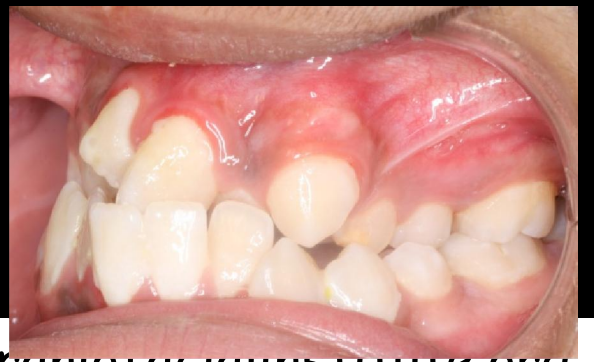
9-13 years

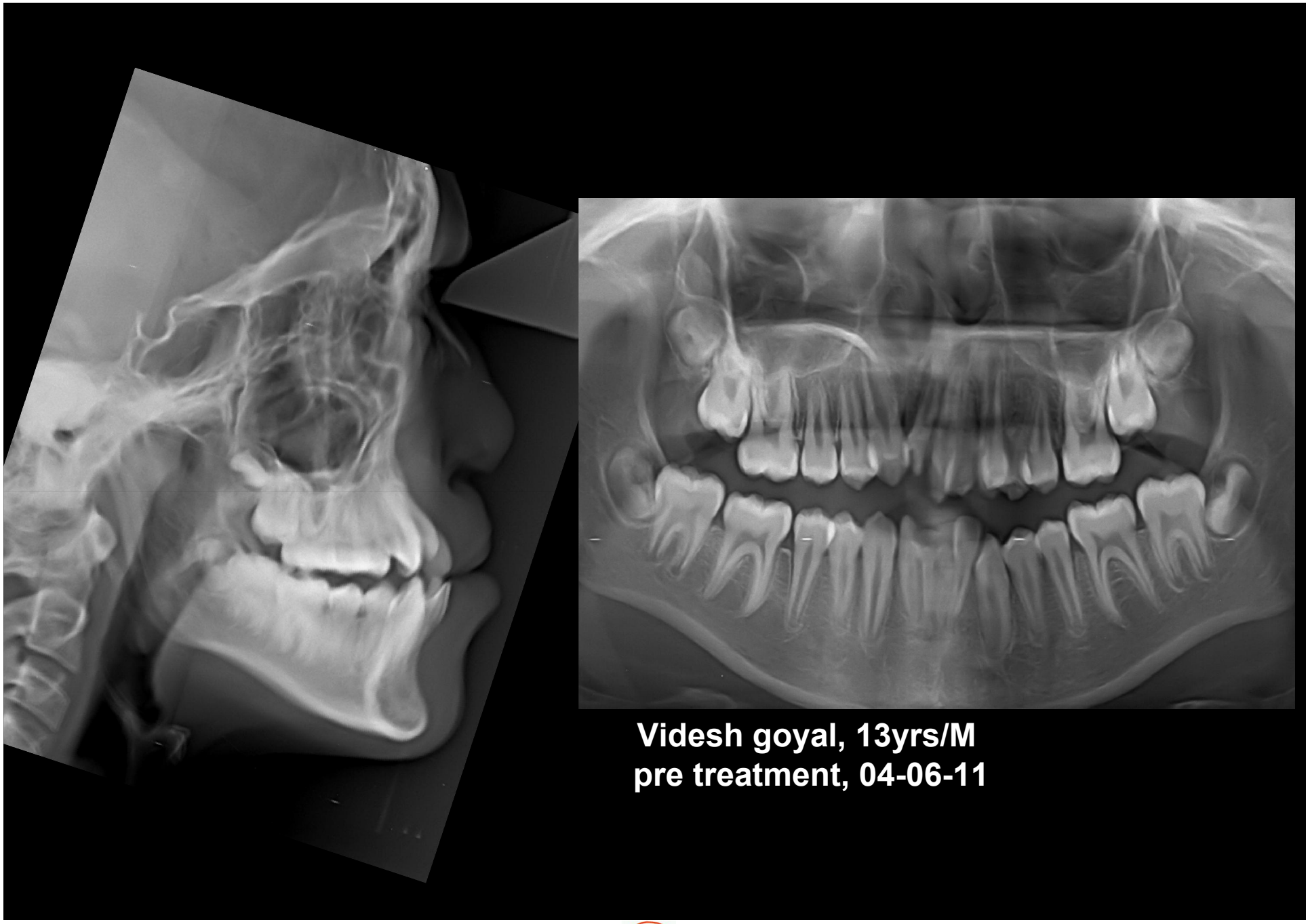
- In most cases, however, expansion of the maxilla and bone grafting of the alveolus is necessary, with the expansion beginning at about 9 to 10 years of age.
- The expanded position of the dental arch is maintained for 6 to 12 months by which time the graft should have taken successfully.
- The procedure should be completed by the age of 10 to 11 years. Full orthodontic alignment can start with the use of fixed appliance when all the permanent teeth have erupted (usually by the age of 13 years).



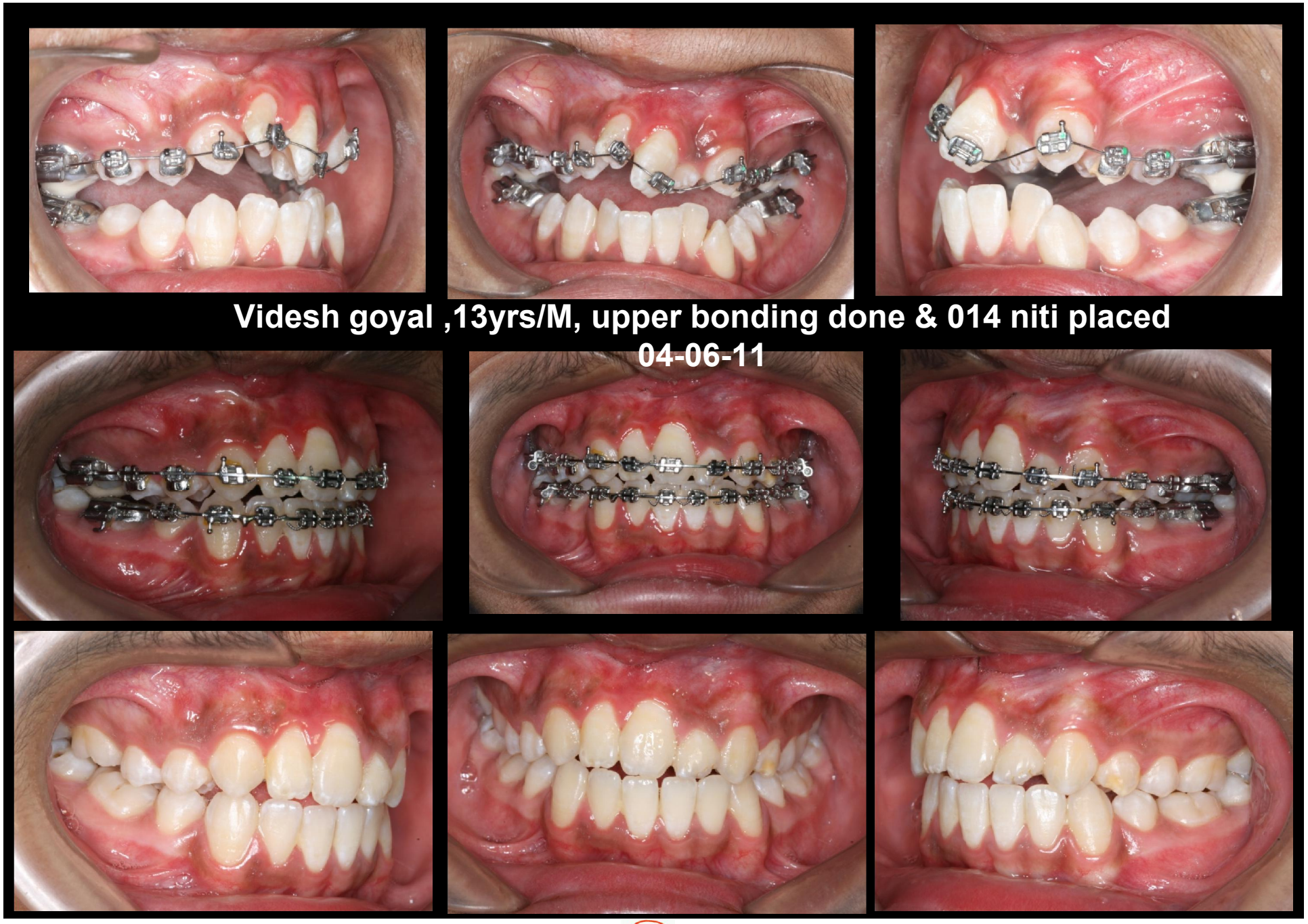



Videsh goyal, 13yrs/M
pre treatment, 04-06-11



Videsh goyal, 13yrs/M
pre treatment, 04-06-11



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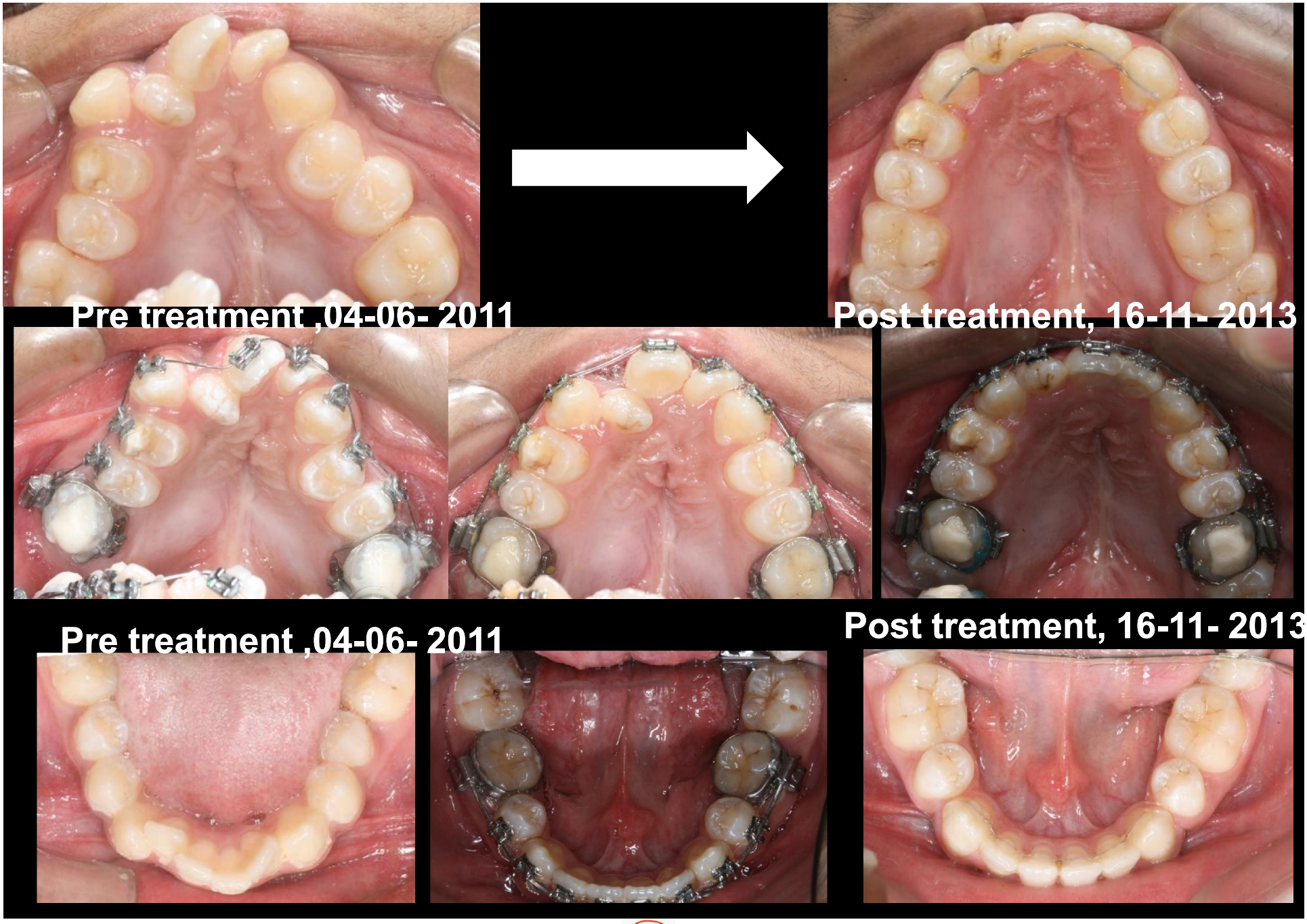
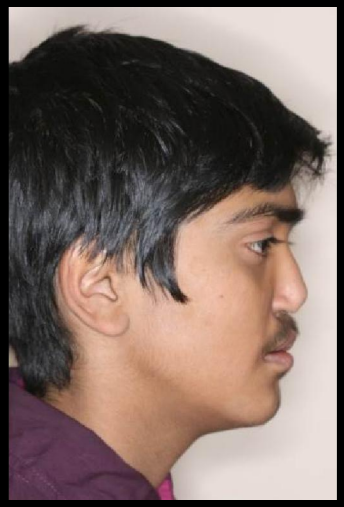
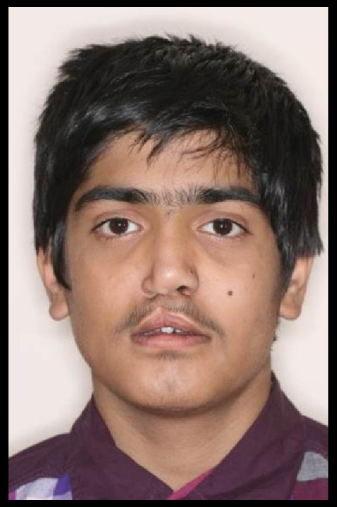
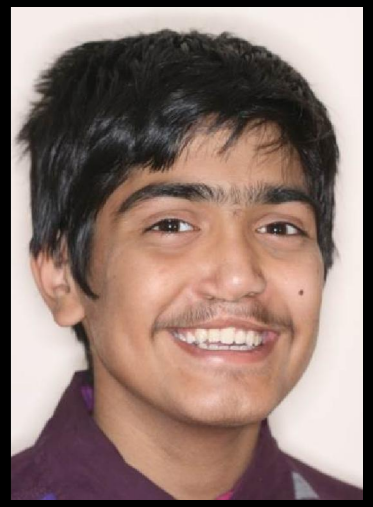
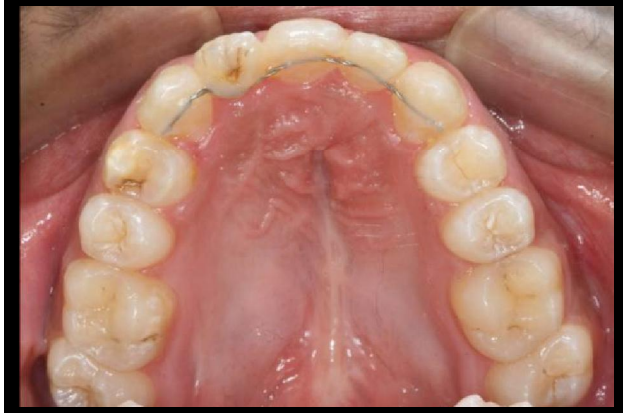

Pre treatment ,04-06- 2011
Post treatment, 16-11- 2013
Pre treatment ,04-06- 2011
Post treatment, 16-11- 2013

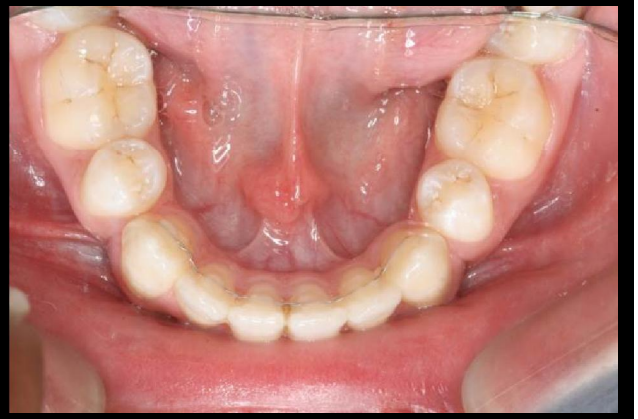


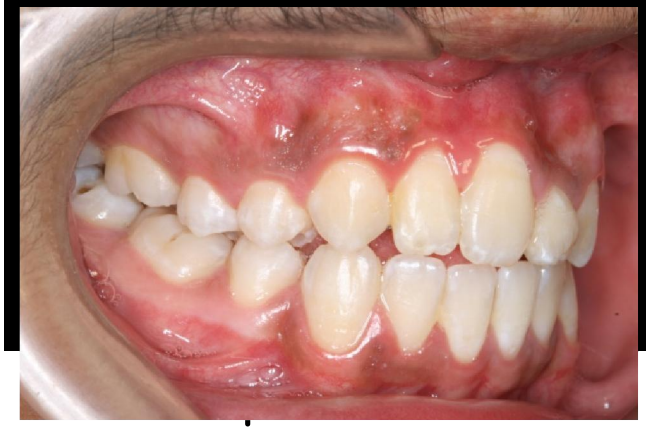


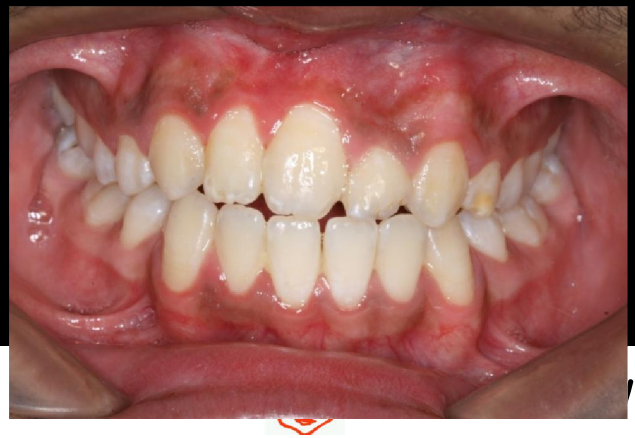


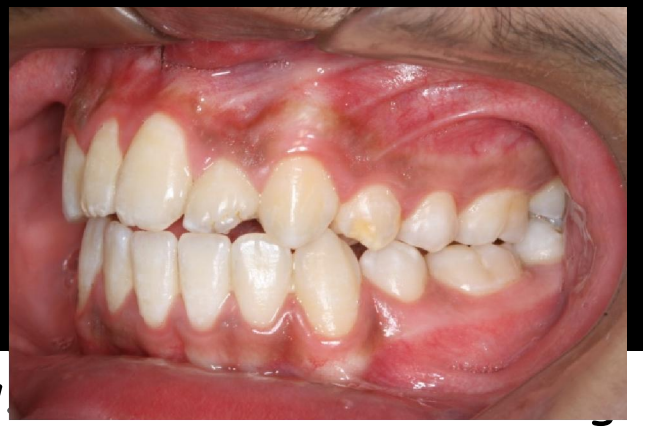


Vidish goial 15yrs-M,
post-treatment ,13-02-14

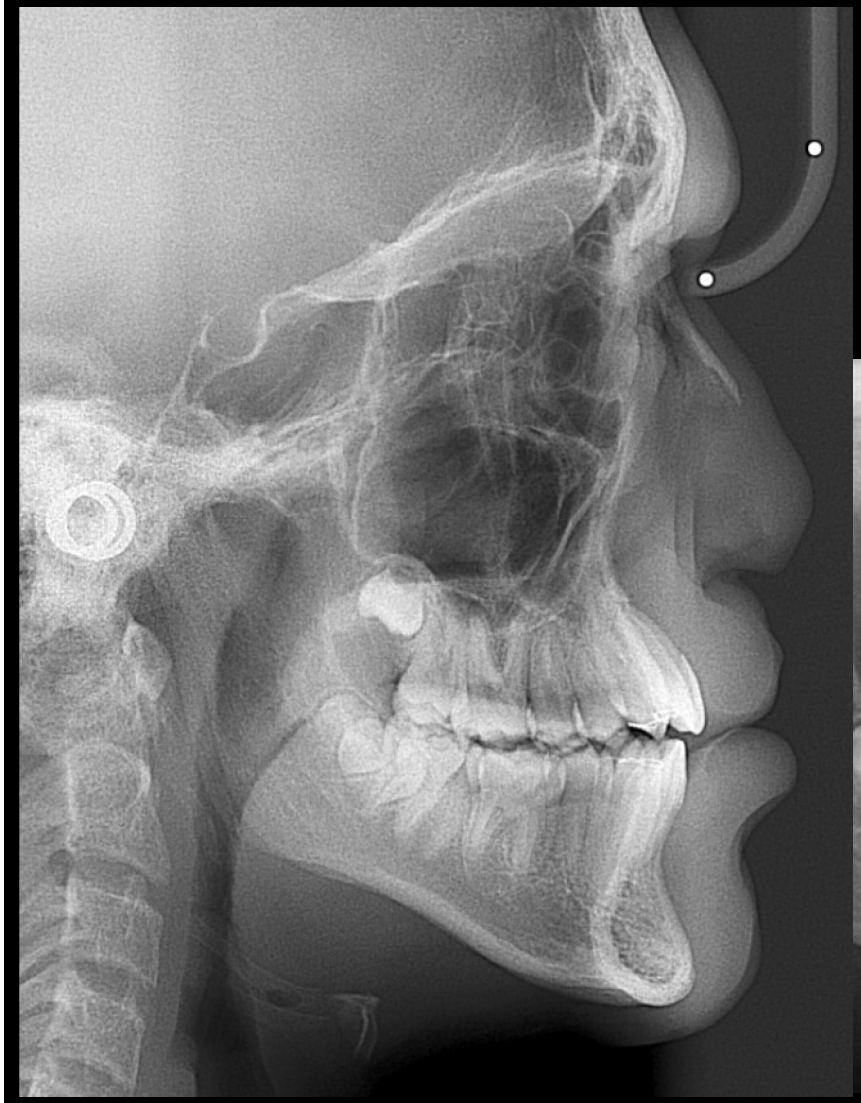


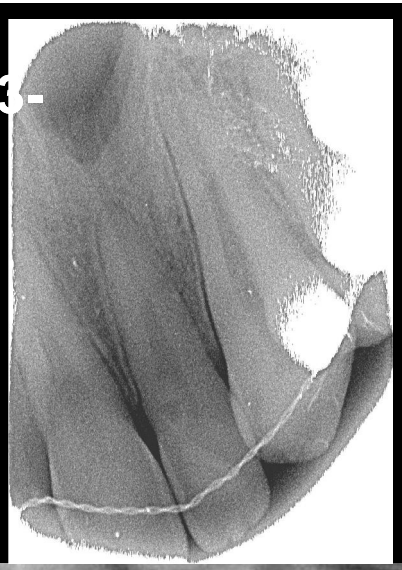


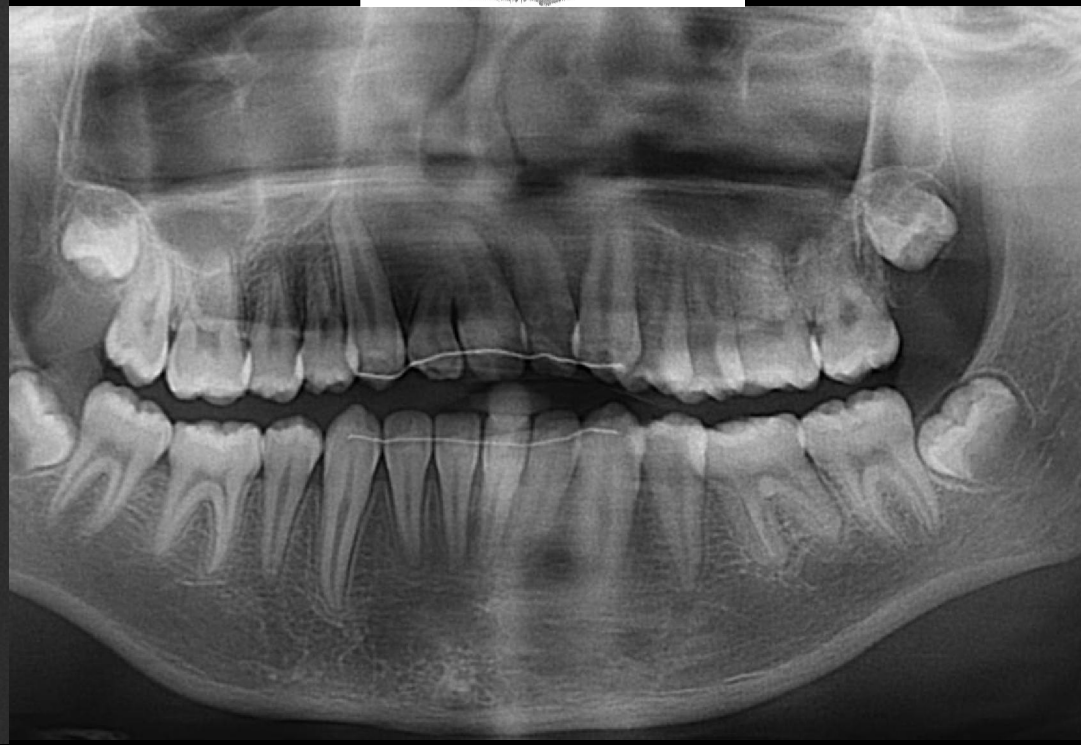




Vidish goial 15yrs-M, post-treatment ,13-02-14

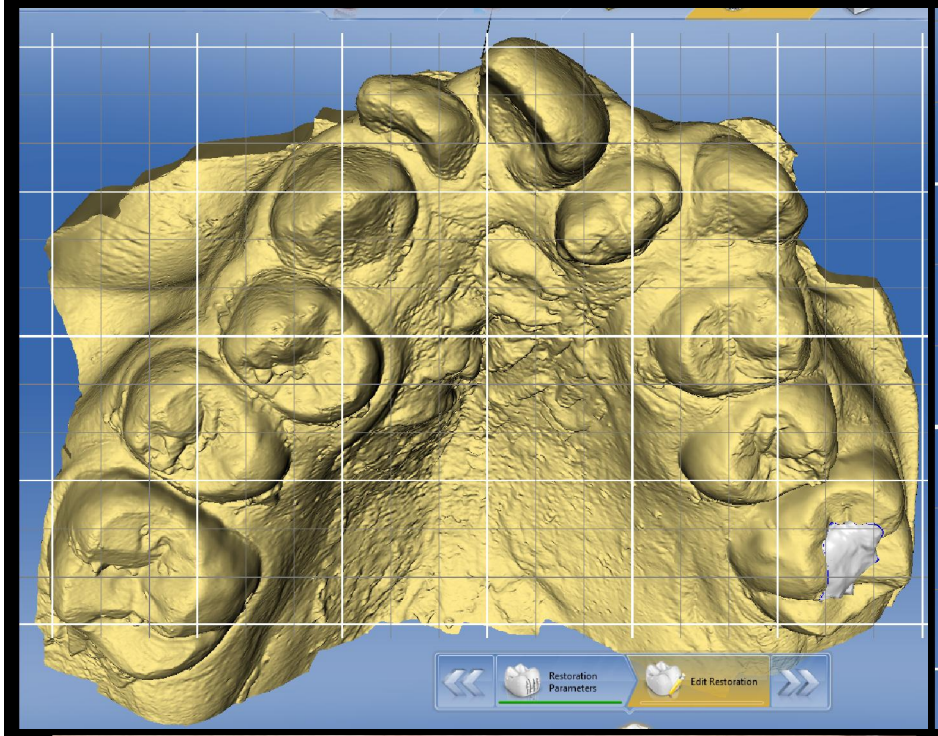


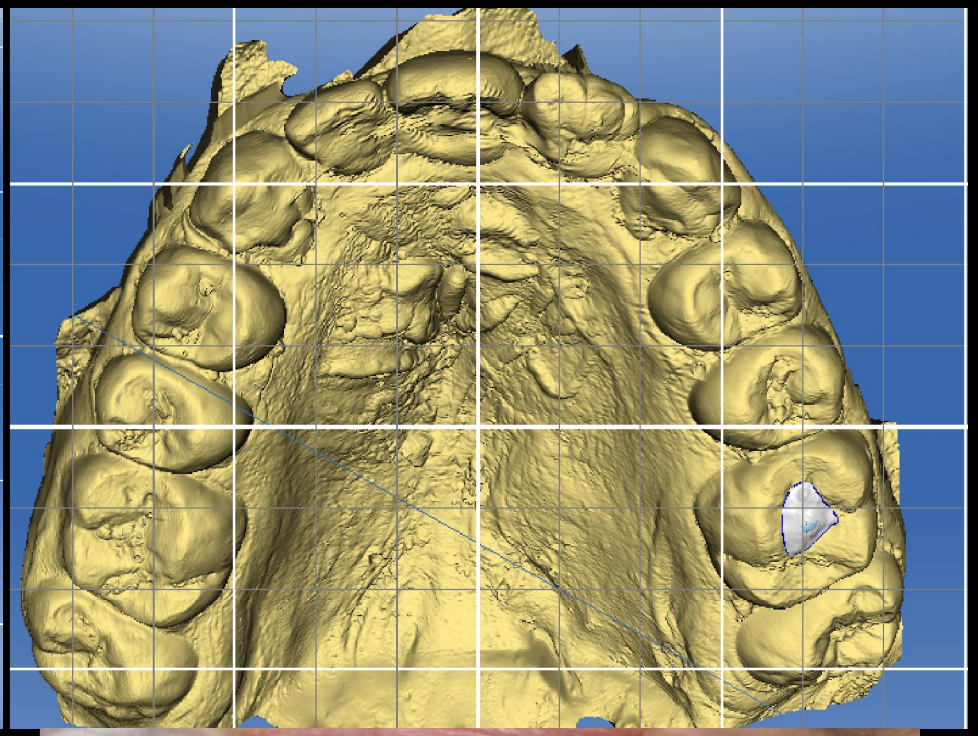


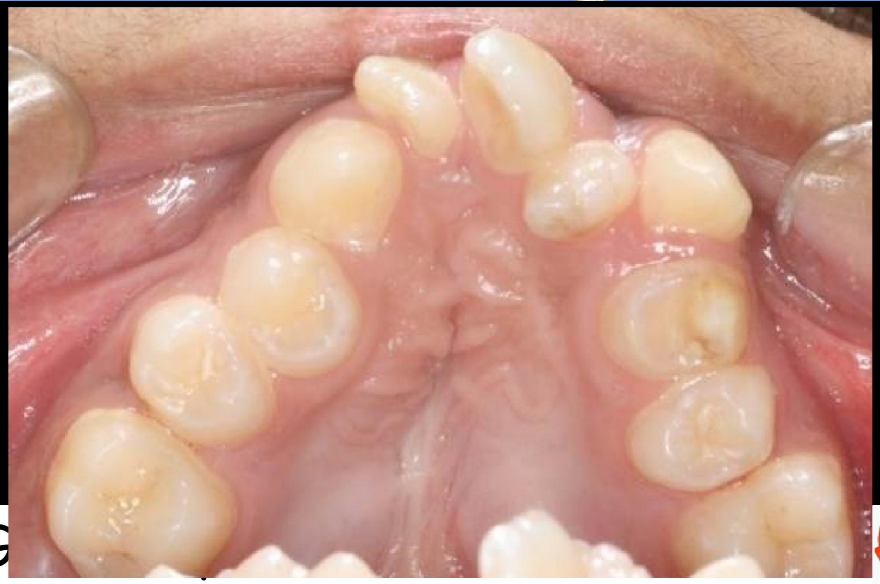


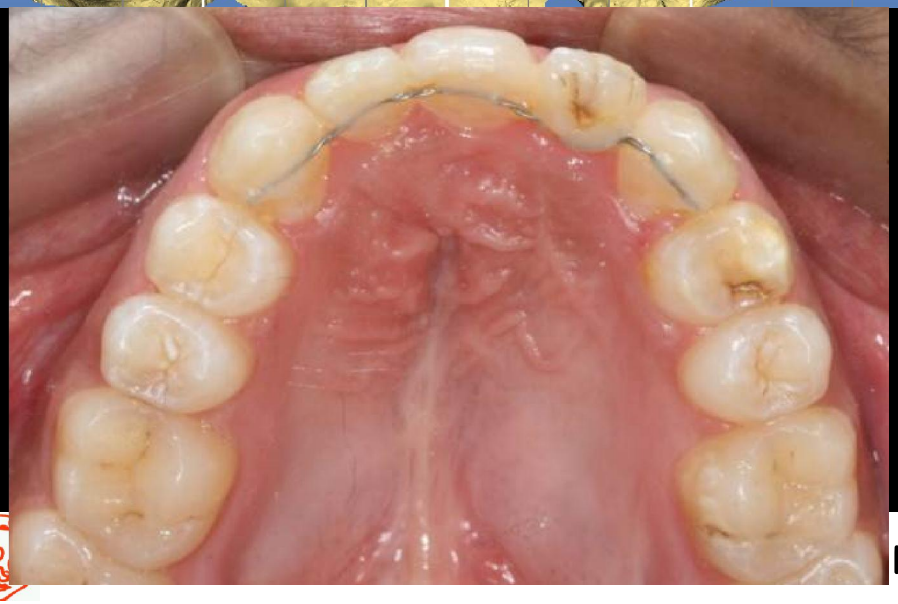
Pre treatment ,04-06- 2011

Post treatment, 16-11- 2013









Retention

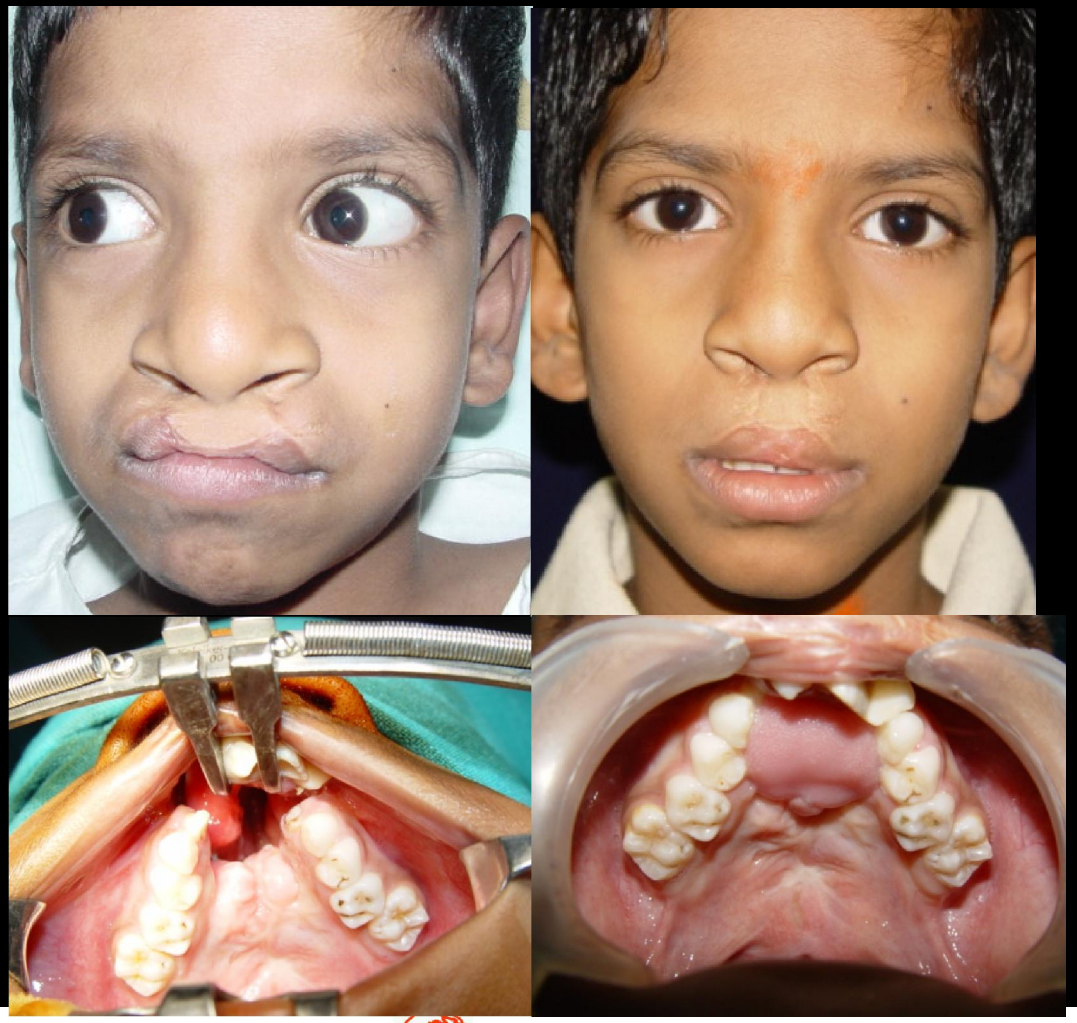
- Up to 20 years of their age Begg labial bow or Hawlays retainer to ware fulltime .

- After 20 years of their age night ware rest of life to prevent arch collapse.

Secondary Cleft Maxilla Surgery

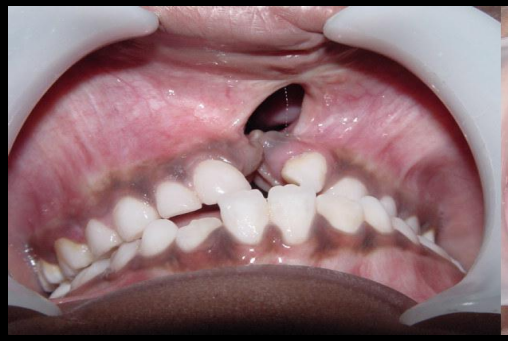
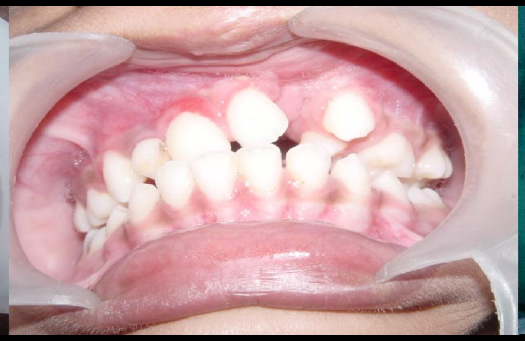
Secondary Cleft Maxilla

Close all palatal fistulae

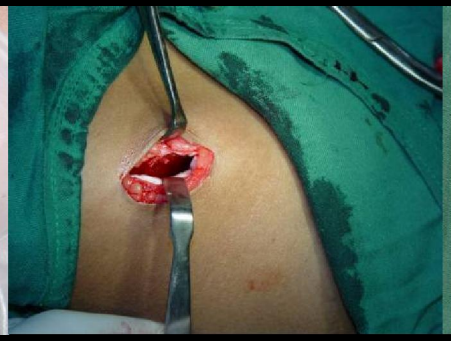
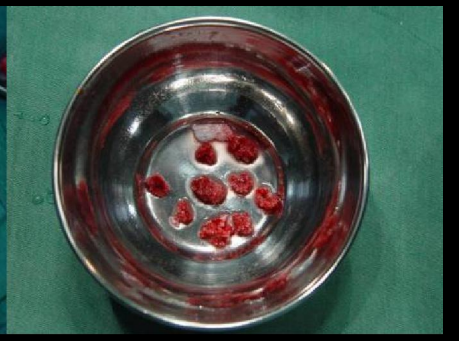


Secondary Cleft Maxilla

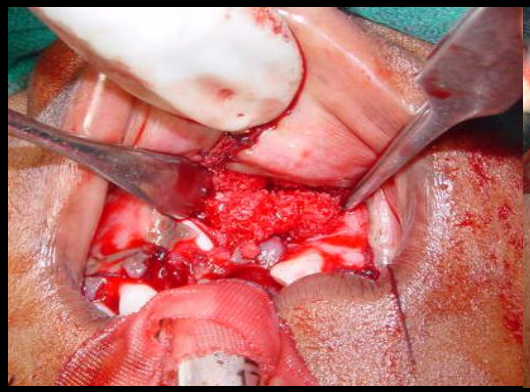
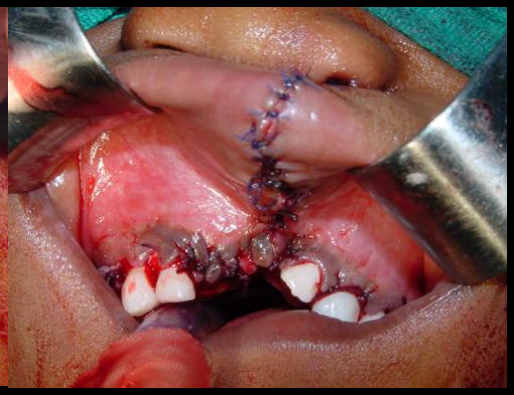
Bone Grafting

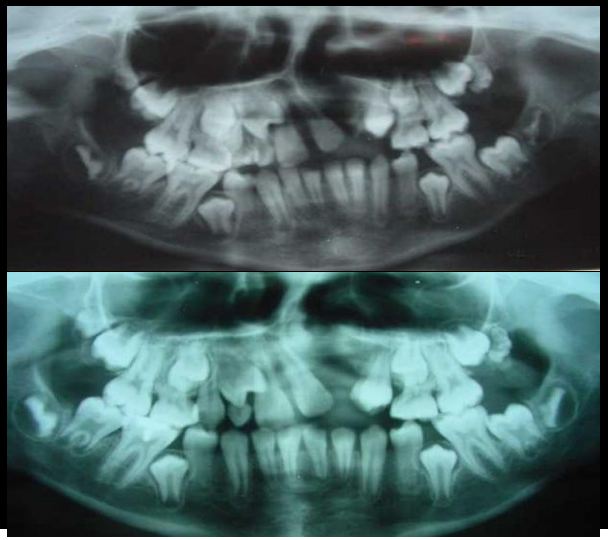
Alveolar bone grafting pre- and post- op

Cortico cancellous bone graft from iliac crest

Bone graft tightly packed in the alveolar area and watertight suturing done

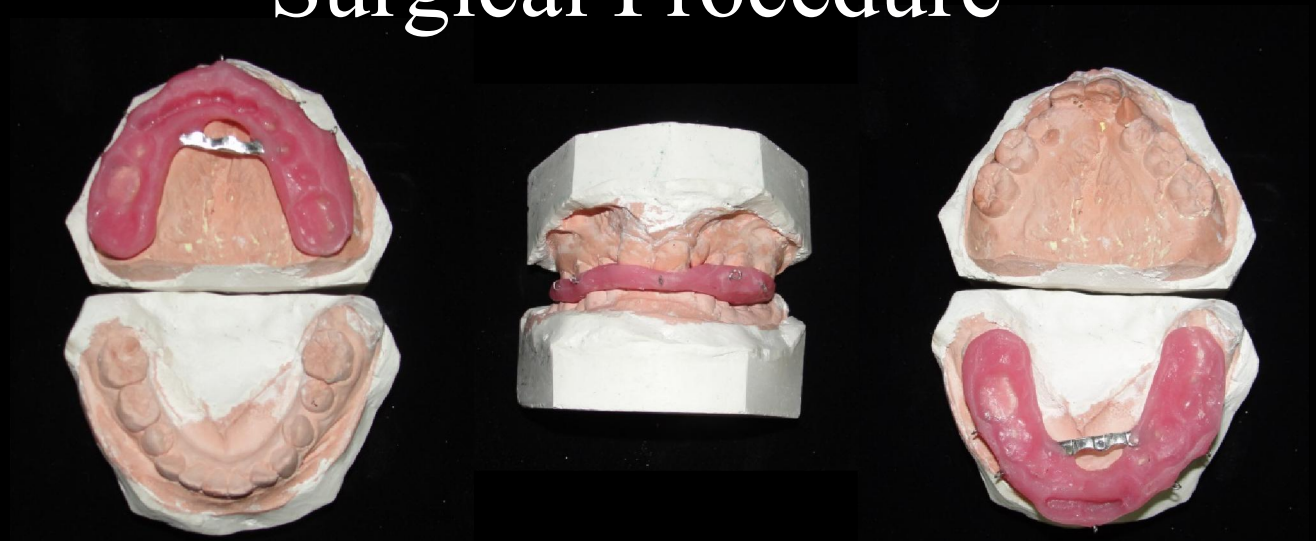


Secondary Cleft Maxilla
Surgical Protocol

Planning:

- The planning for moving the cleft maxilla remains the same for either distraction or orthognathic surgery.
- Distraction is preferred to Orthognathic surgery in SCM if
  - Scarring of the palate is severe
  - Amount of movement required more than 10 mm.
- Rhinoplasty is always done after all treatment is finished

Surgical Procedure



NEED FOR A REINFORCED SPLINT

- To guide the maxilla into the desired occlusion when maxillary advancement is being done
- To counter the unfavorable movements due scar formation
- Cross bar prevents posterior collapse of the arch

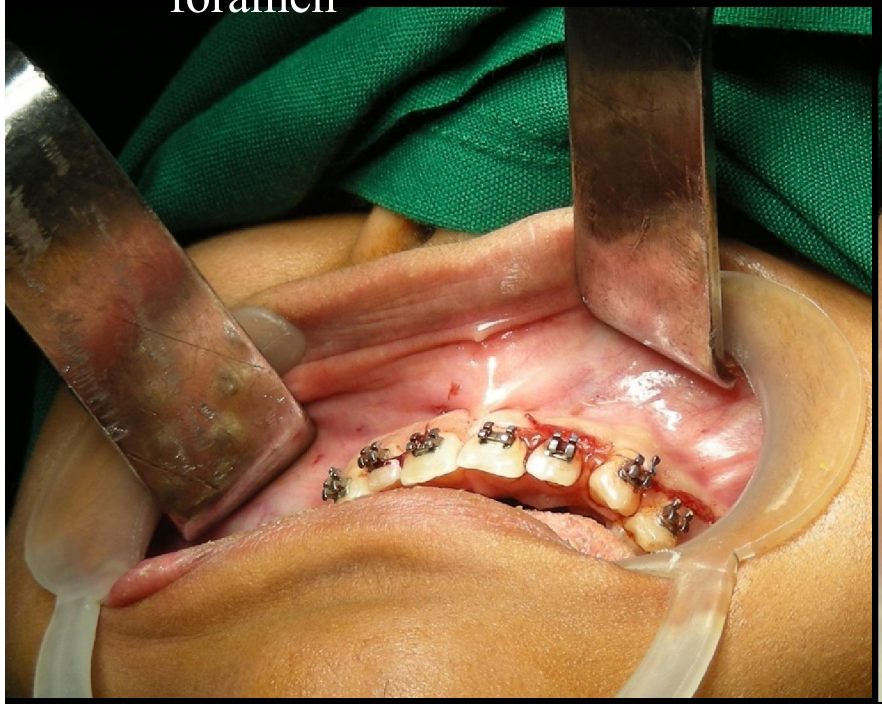
Performing a LeFort I Osteotomy

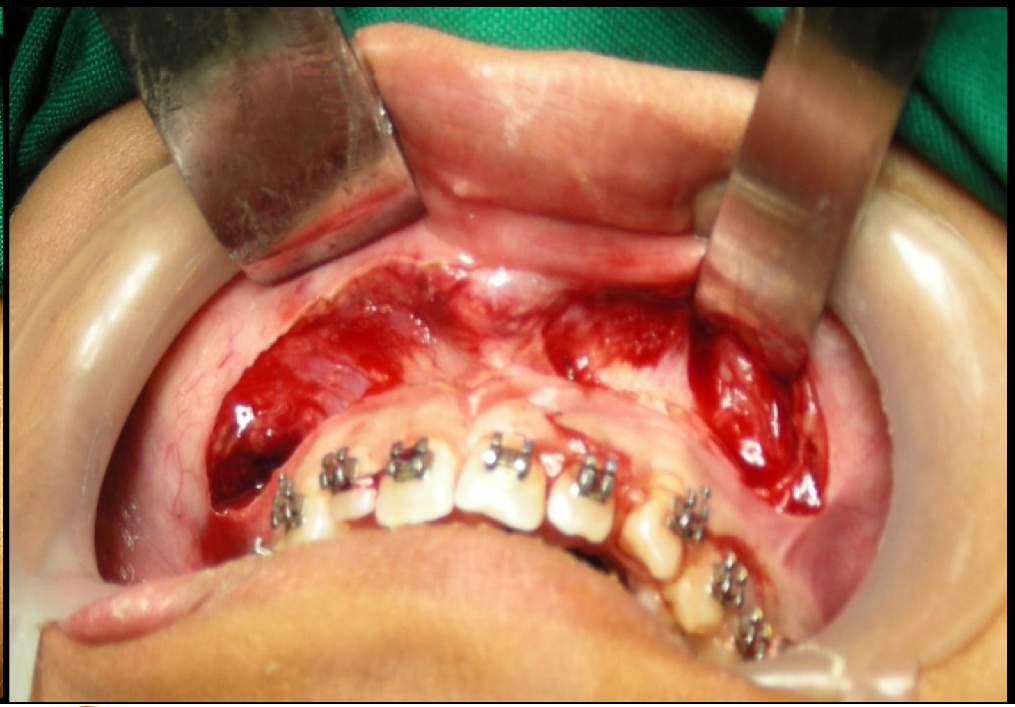
Incision Design

- In the buccal sulcus about 6mm above the gingival margin.

Sub periosteal dissection

- Expose the lateral aspect of nasal cavity and carefully elevate the nasal mucosa without perforating it.
- Posteriorly, dissect around the tuberosity and tunnel up to the pterygoid.
- Superiorly, expose the anterior maxillary wall, identifying the inferior orbital foramen

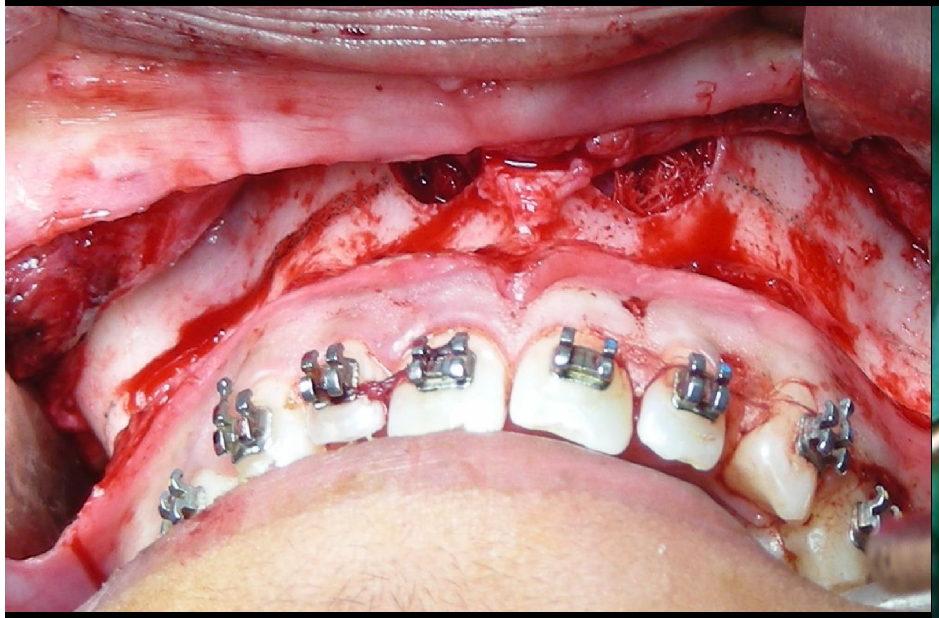


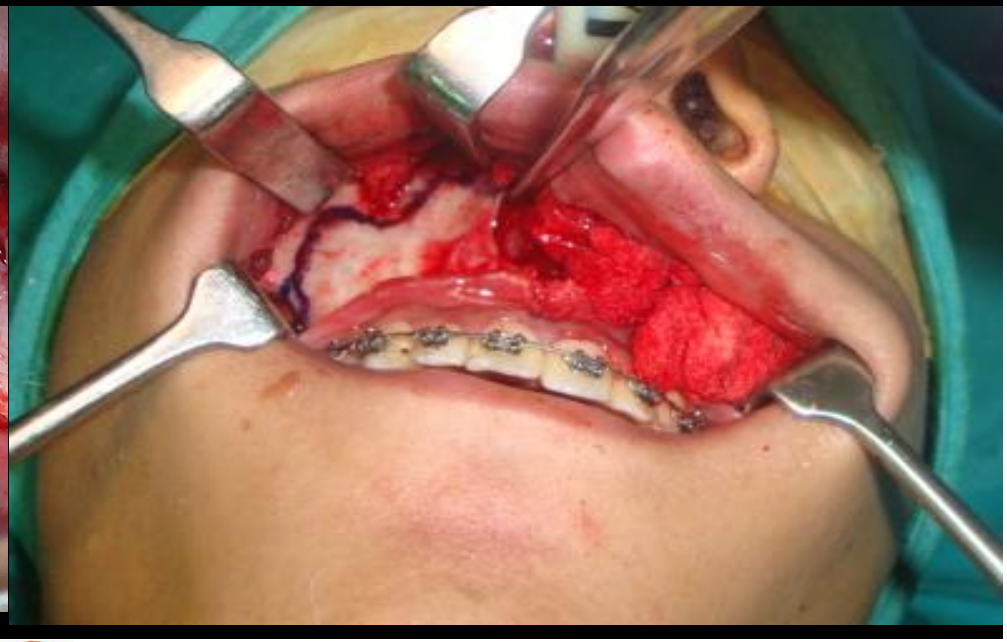


Performing a LeFort I Osteotomy

Osteotomy Cut

- The osteotomy cuts are placed 2-3mm higher than the conventional Lefort I ostetomy,
- To distract and advance the mid face and not only the maxilla
- To provide a cuff to place the plate and stability to the distracting segment.

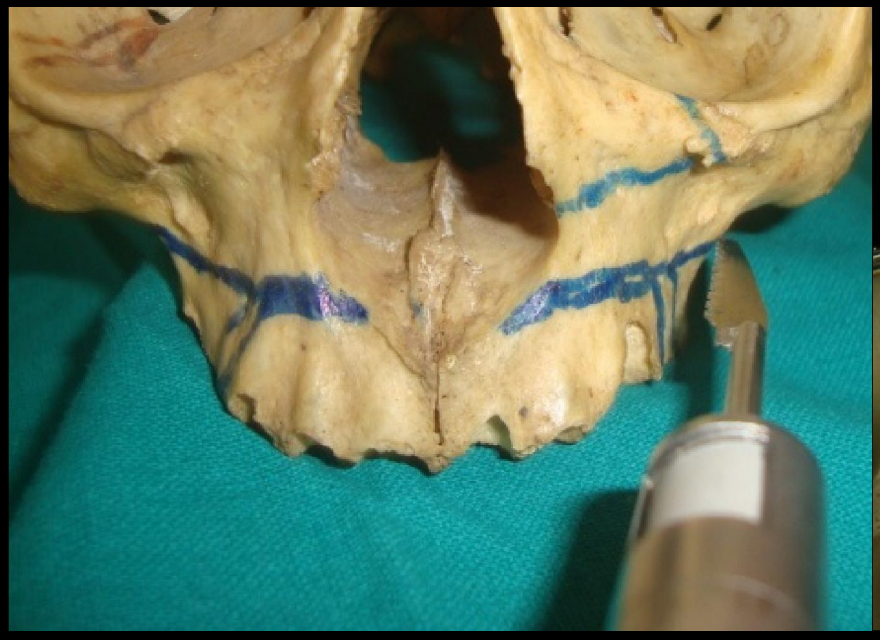


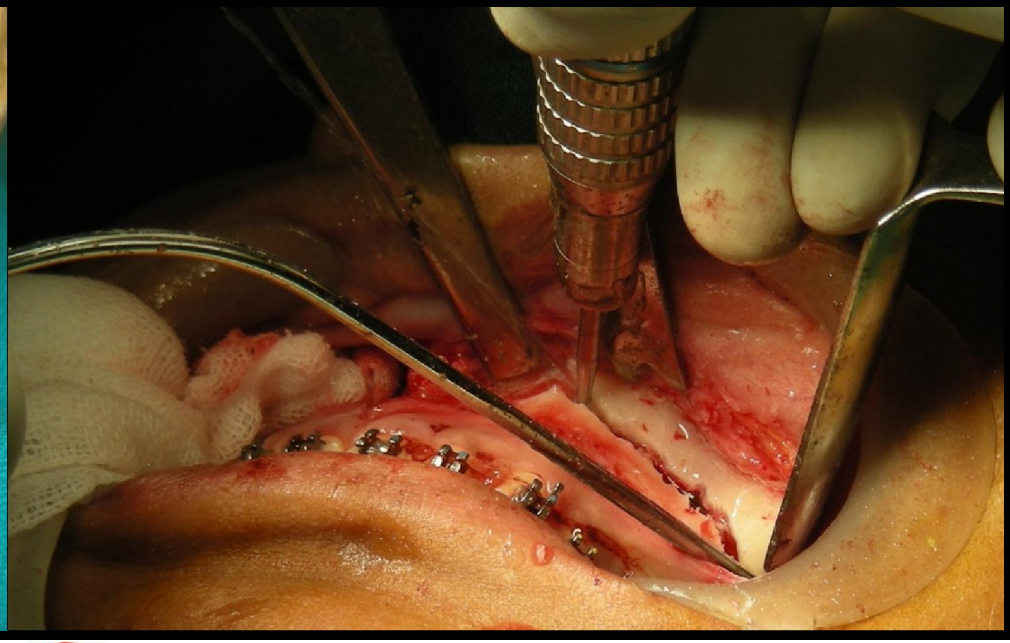


Performing a LeFort I Osteotomy

Anterior buccal osteotomy

- Lateral wall of the maxilla is cut with the help of a Reciprocating Saw with copious irrigation.
- The Lateral wall osteotomy can have variations in the design

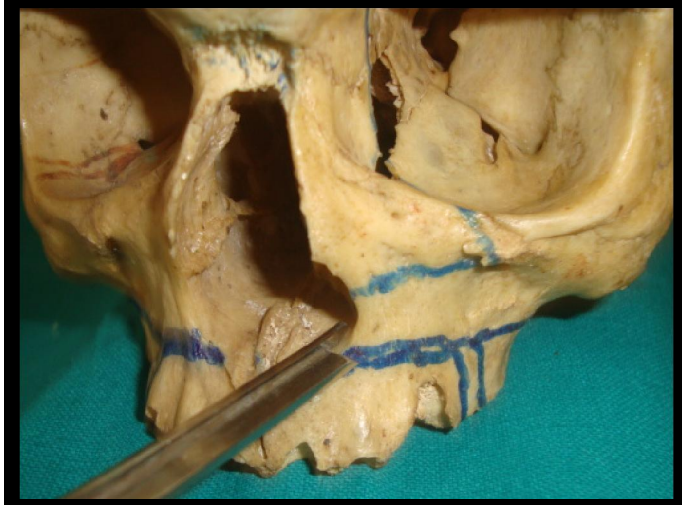
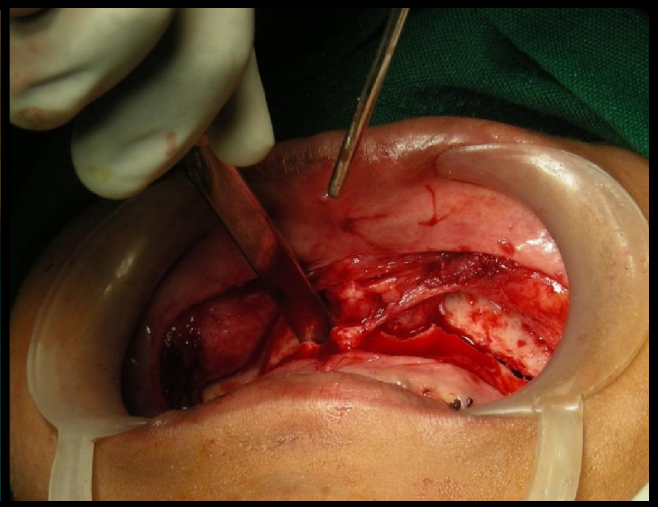
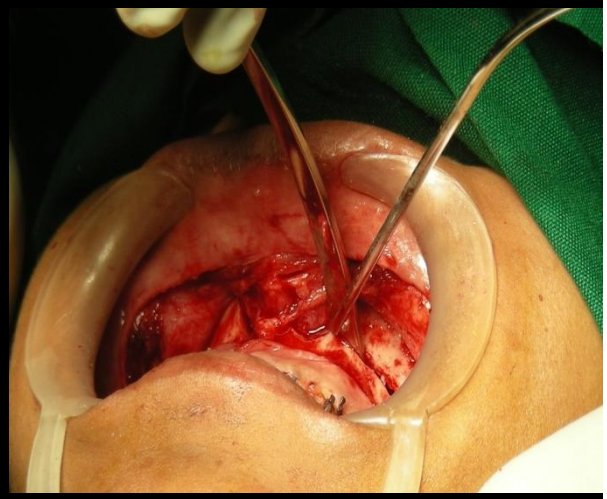




Performing a LeFort I Osteotomy

Medial and posterior wall osteotomy

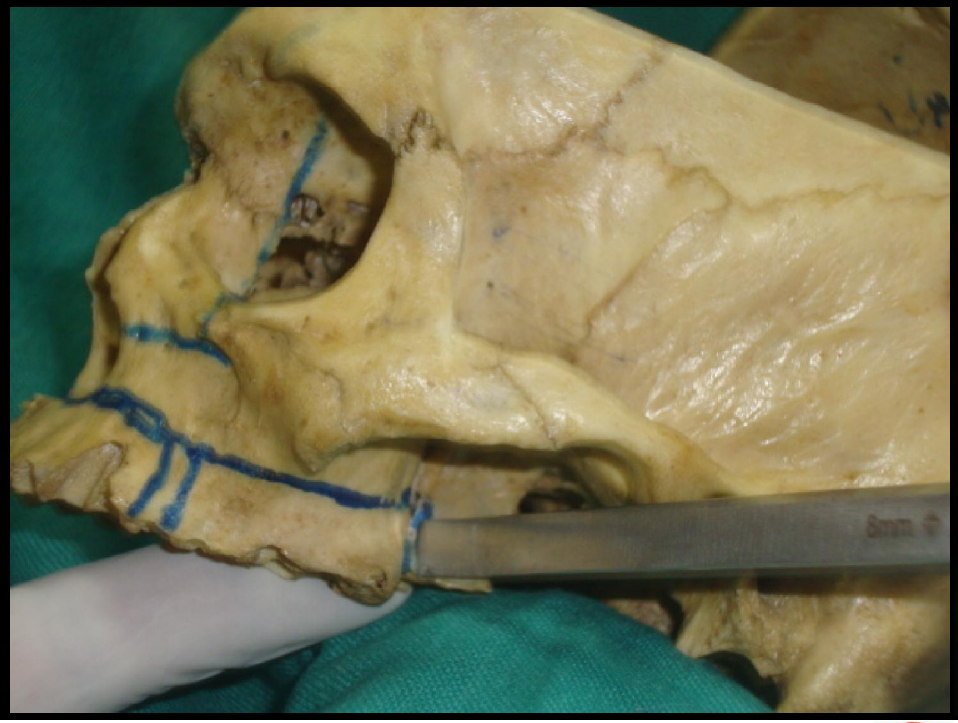
- A thin guarded osteotome is used to and tap gently and carefully to fracture the medial (lateral nasal wall) and posterior wall of maxilla.
- The nasal mucosa is protected from injury with a periosteal elevator while completing the osteotomy.

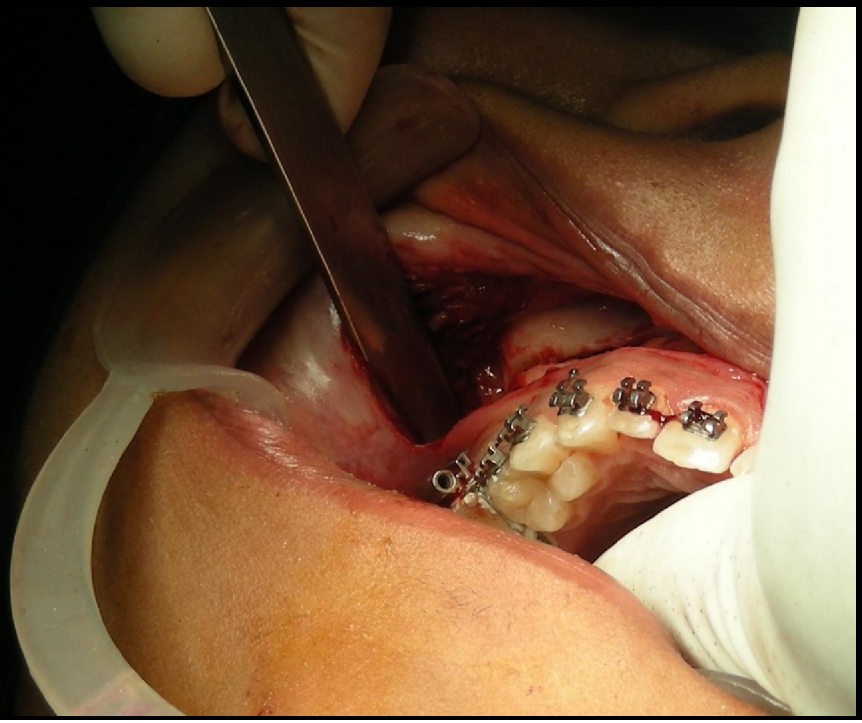




Performing a LeFort I Osteotomy

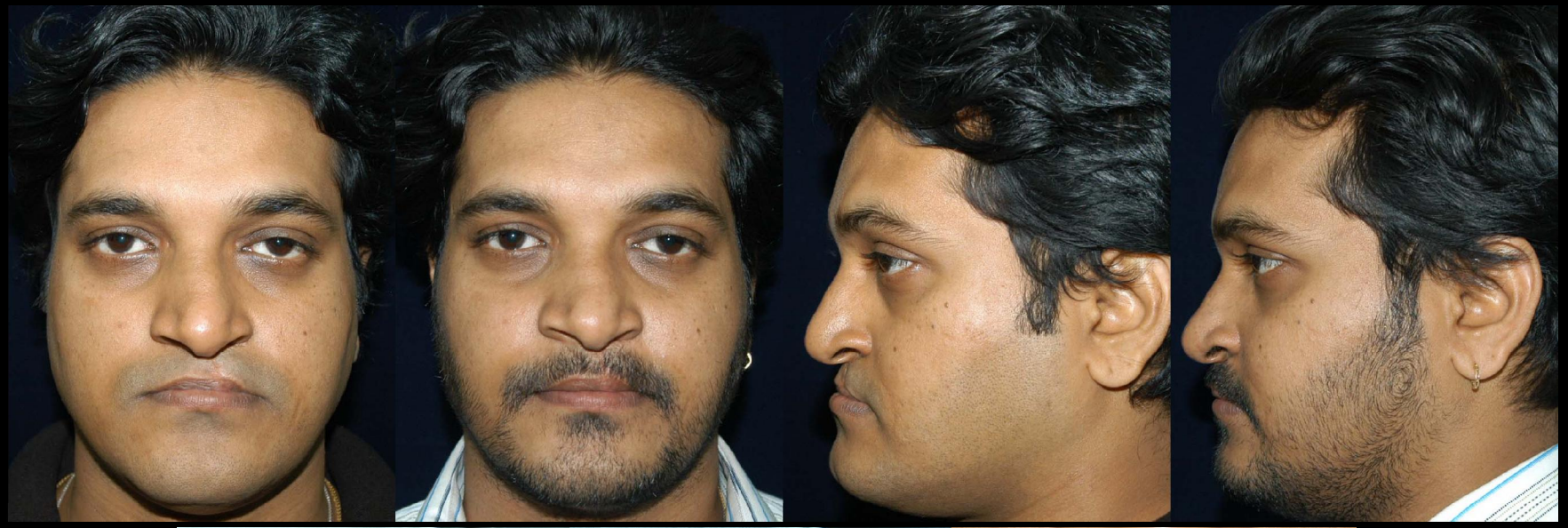
Pterygomaxillary osteotomy

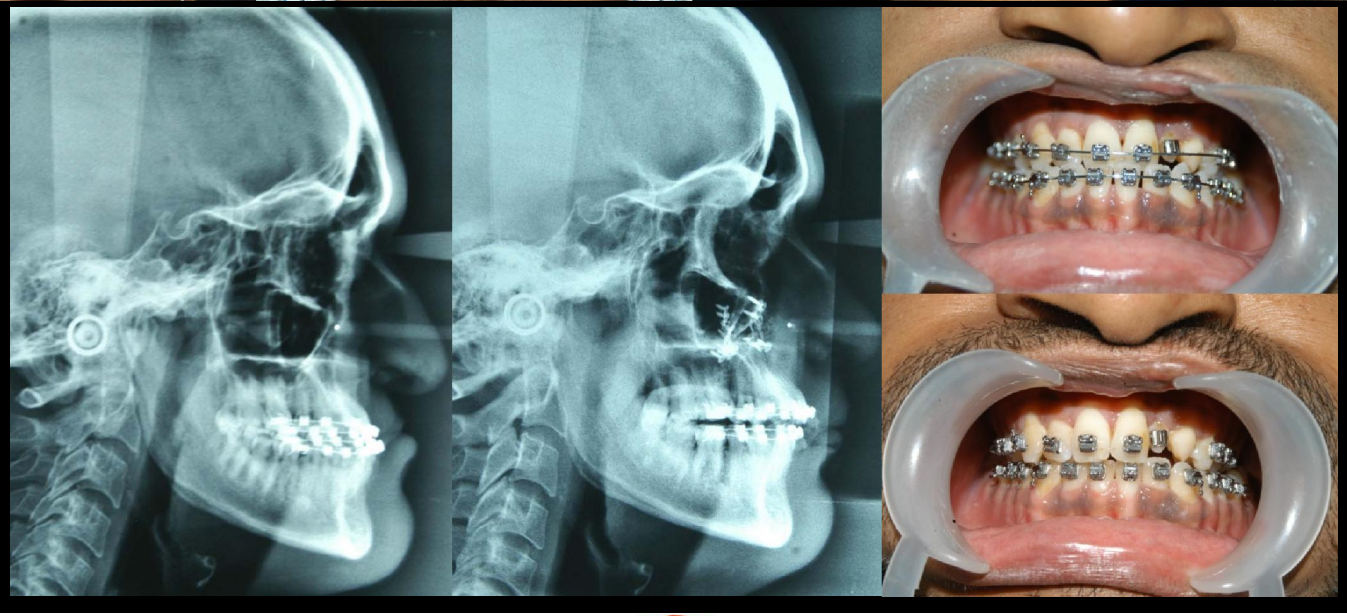
- The pterygoid plate is separated from the maxilla using a pterygoid osteotome.
- The pterygoid hamulus is felt and palpated with the ball of the index finger to prevent excess in chiseling and damage to the soft tissues.
- Failure to separate the tuberosity from the pterygoid plates will cause difficulty in downfracture or an unfavorable fracture.



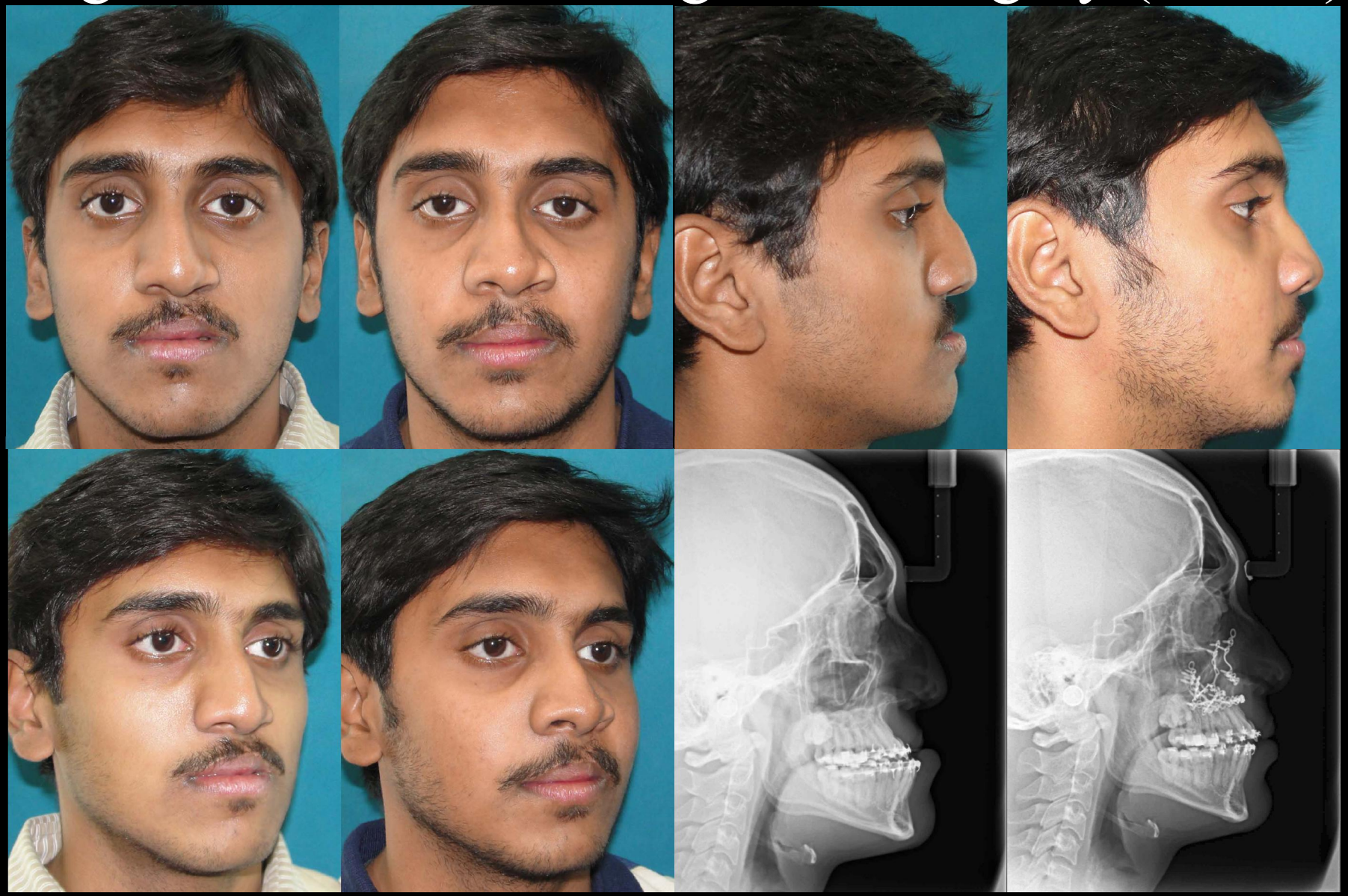


Surgical Procedure Orthognathic Surgery (7mm)



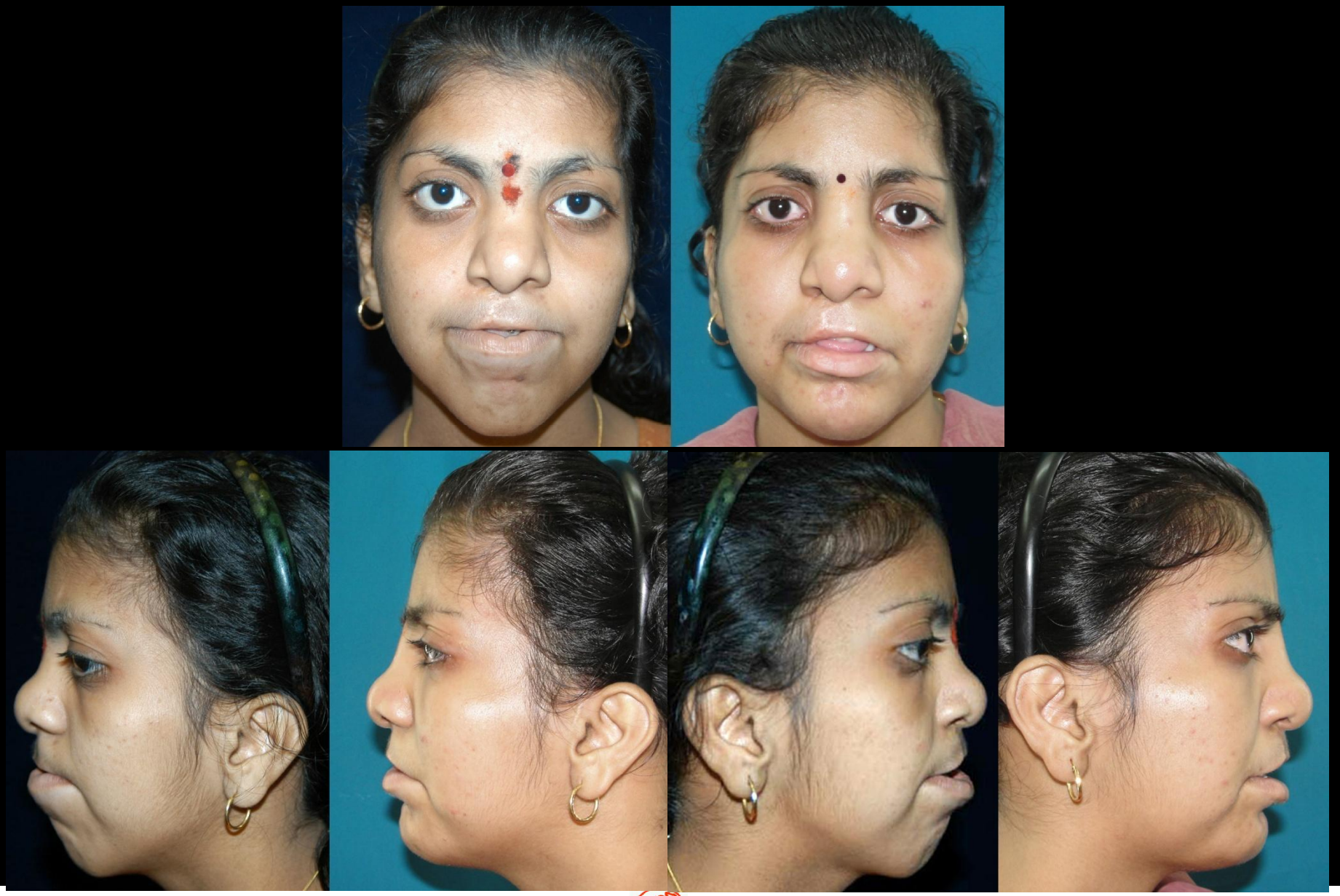


Surgical Procedure Orthognathic Surgery (10mm)



Surgical Procedure Orthognathic Surgery(14 mm)

LeFort III Osteotomy



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LeFort I+III Osteotomy

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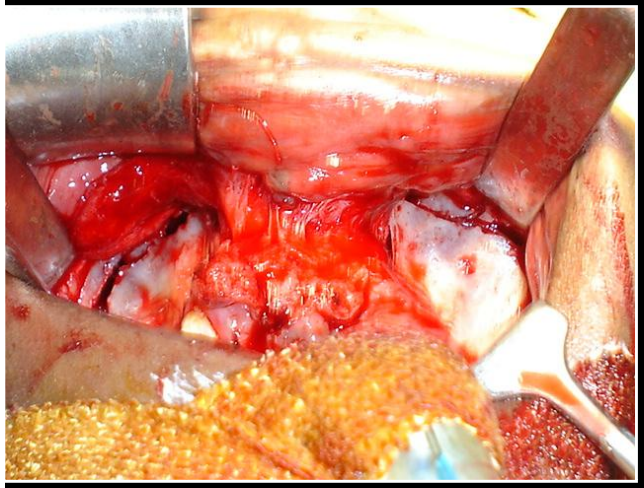
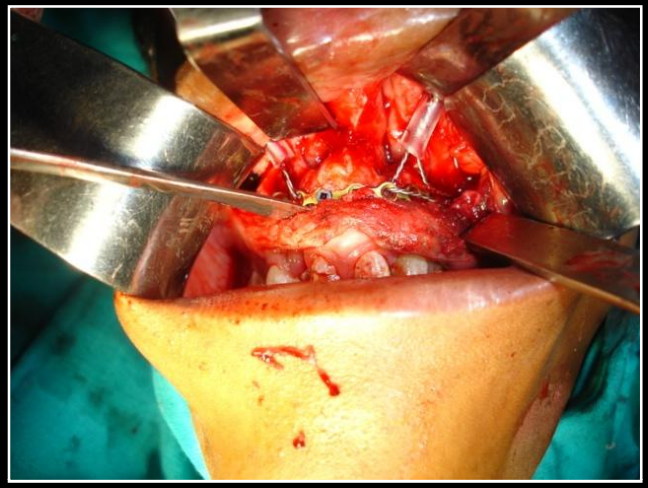
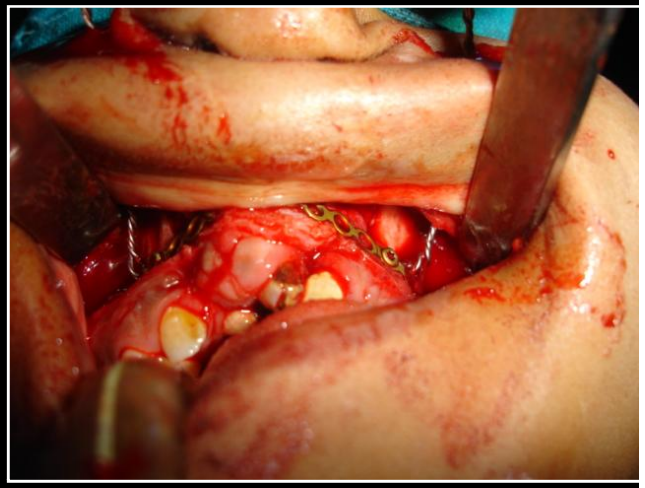
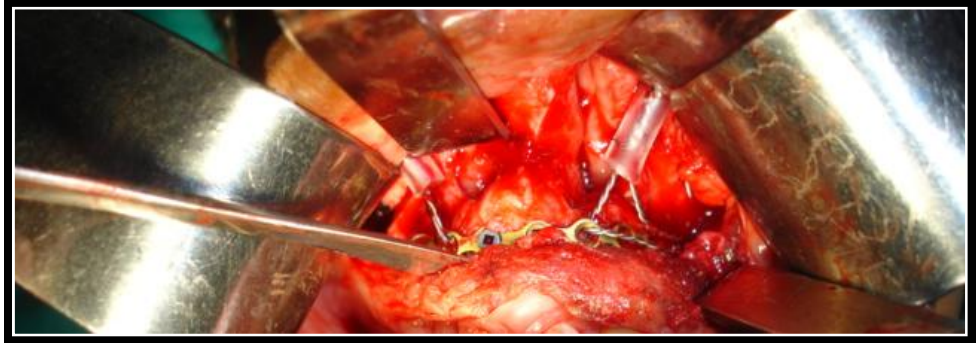
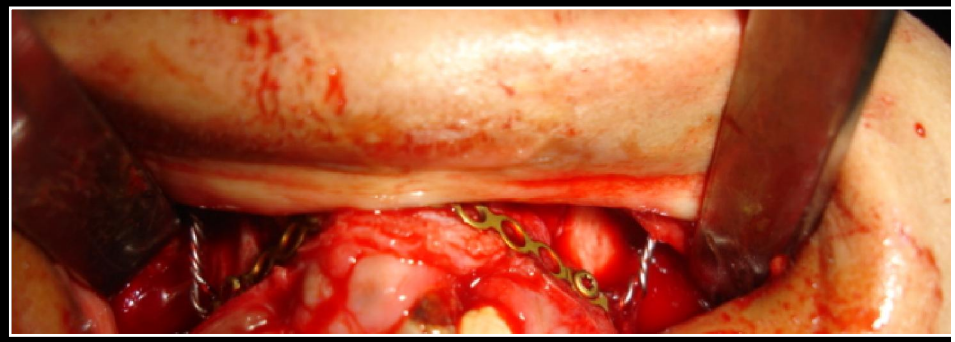
Surgical Procedure Distraction

- Sulcular incision is given in the upper labial vestibule.
- Lefort I maxillary osteotomy with pterygoid disjunction but without down fracture of maxilla is done.
- The osteotomy cuts are placed 2-3mm higher than the conventional Lefort I ostetomy, to provide a cuff to place the plate and stability to the distracting segment.
- A single 2 mm bone plate is fixed from the zygomatic buttress on one side to the other side

Surgical Procedure Distraction

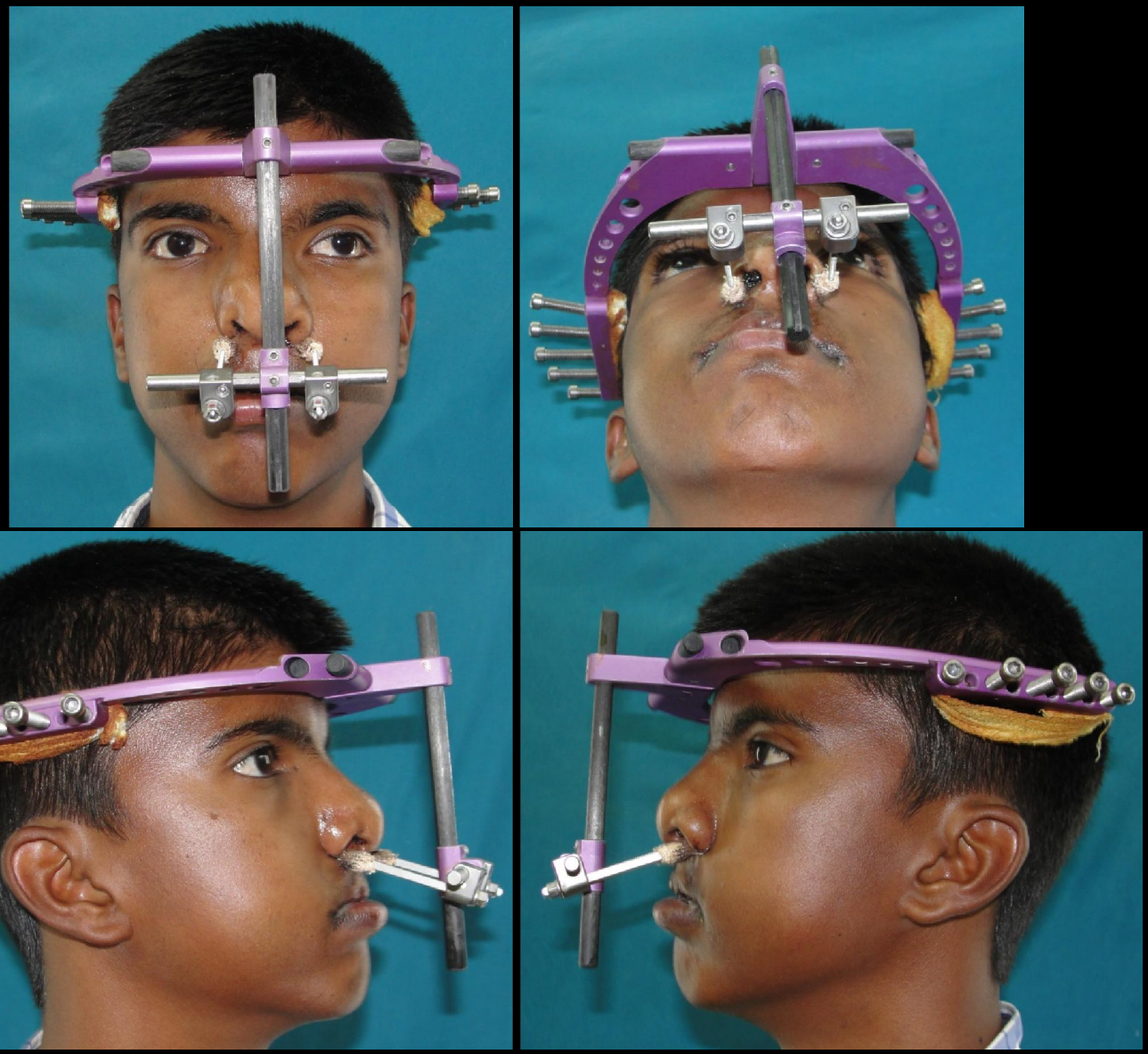




NEED FOR ANTERIOR BONE PLATE

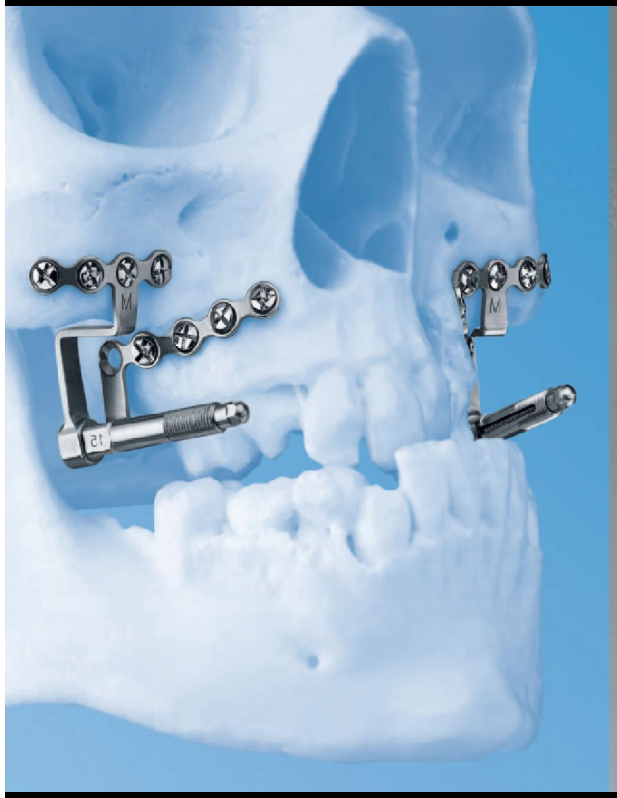
- The anterior bone plate holds all cleft segments together thereby ensuring equal forward movement for all segments.
- It also provides an ideal anchorage for the distraction wires.

Surgical Procedure Distraction

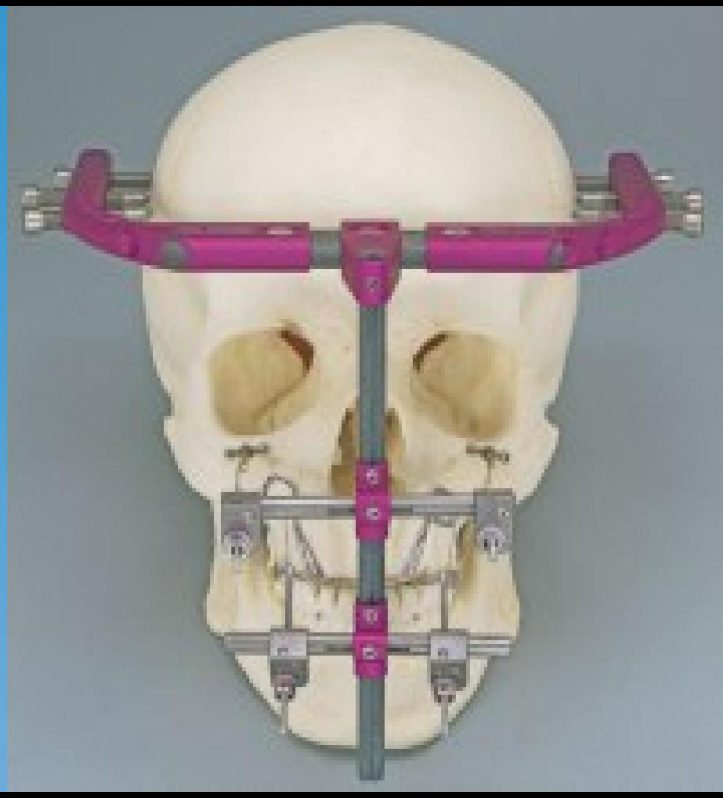


Midface Distraction for Secondary Cleft Maxilla

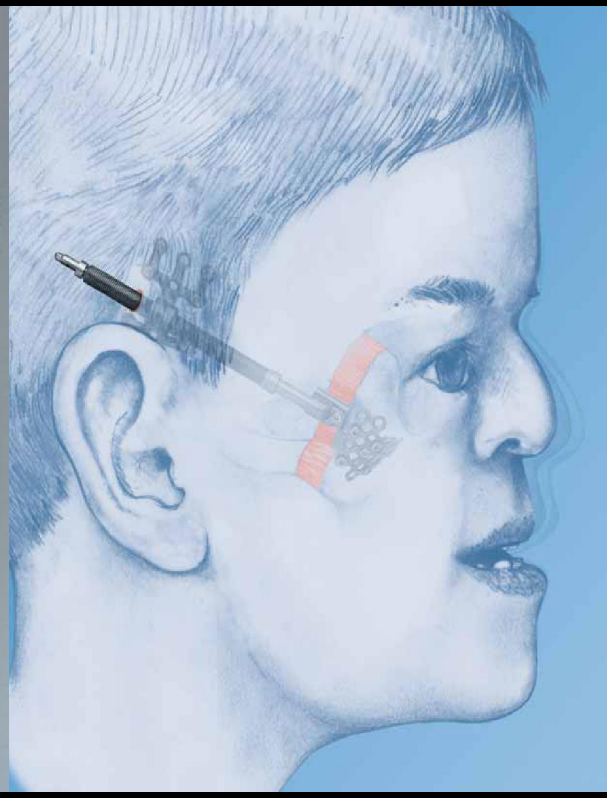
Different methods of distraction



Internal Pull Distraction

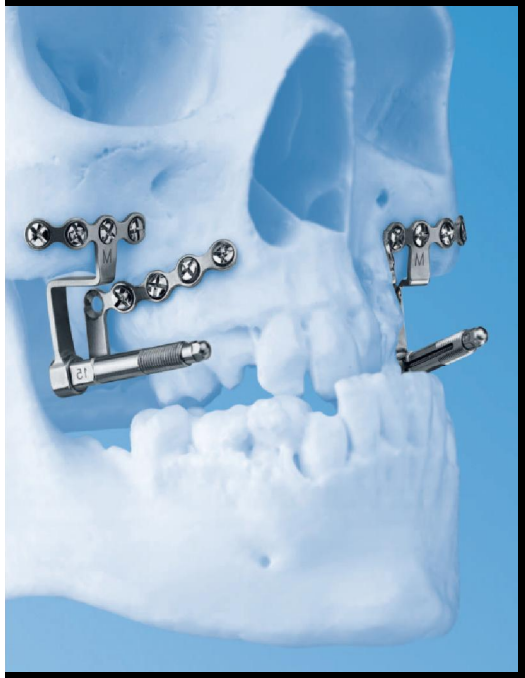


External Pull Distraction



Internal Push Distraction

Different methods of distraction

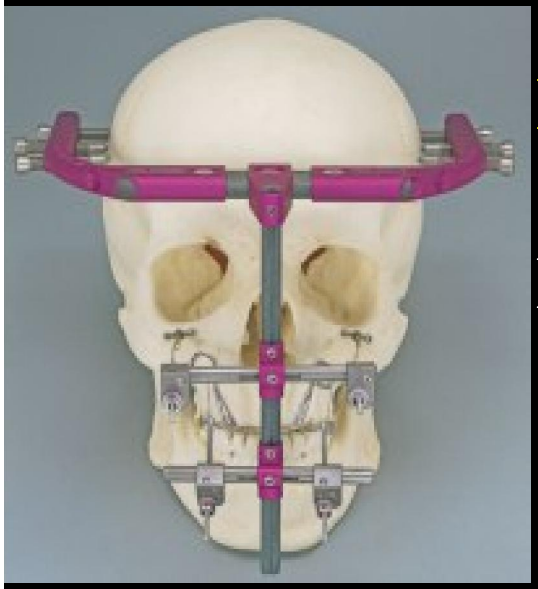


Internal Pull Distraction

Useful only in patients with normal shaped maxillary arch

Not suitable for secondary cleft maxillary arches which are constricted due to absence of parallelism of vectors

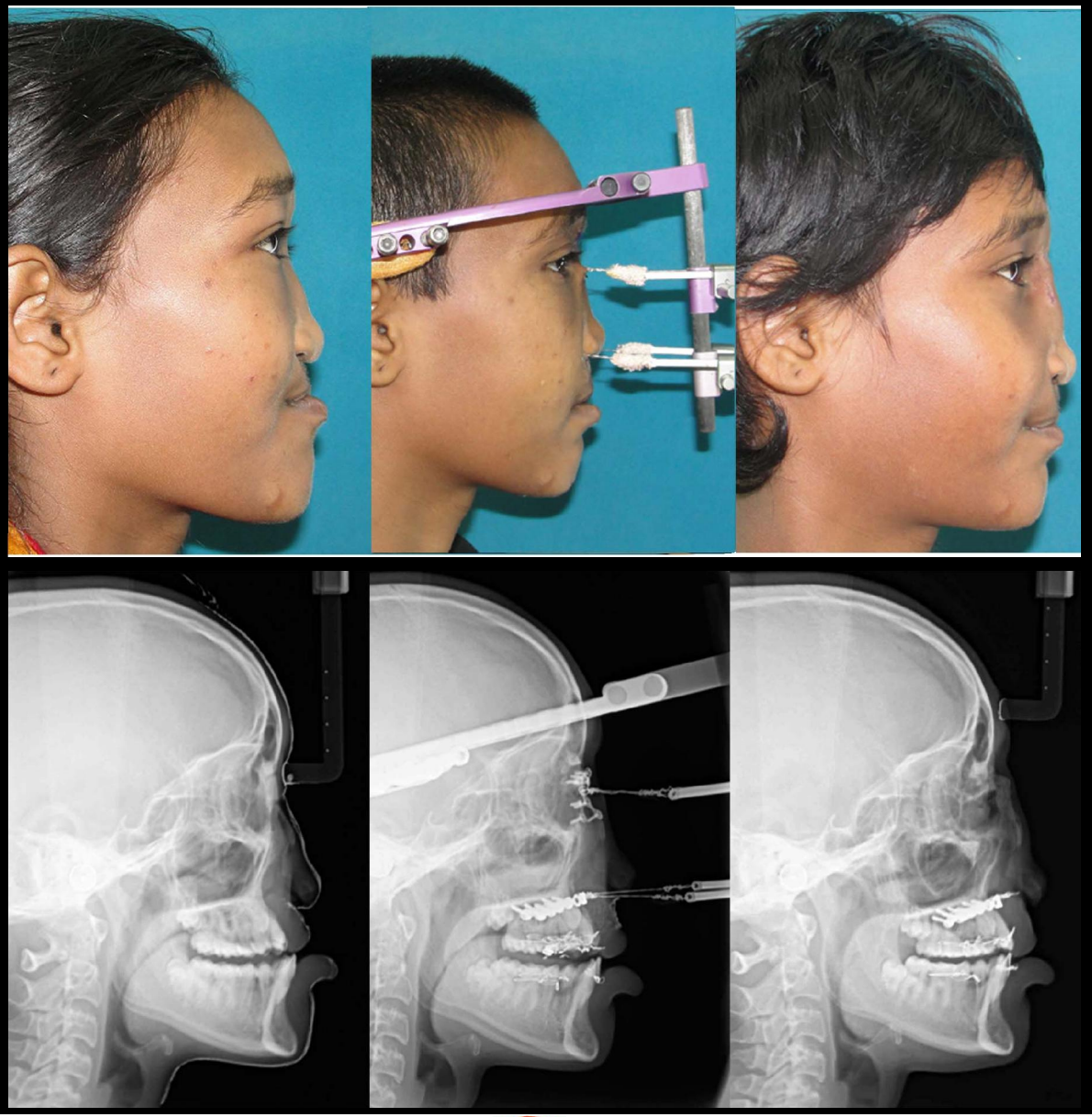
Different methods of distraction



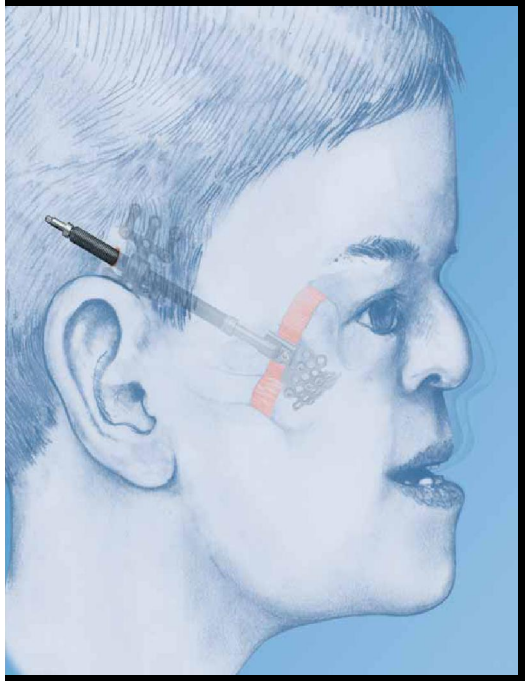
External Pull Distraction

Most suitable for forward movement of constricted and collapsed arches of the secondary cleft maxilla

LeFort II Distraction



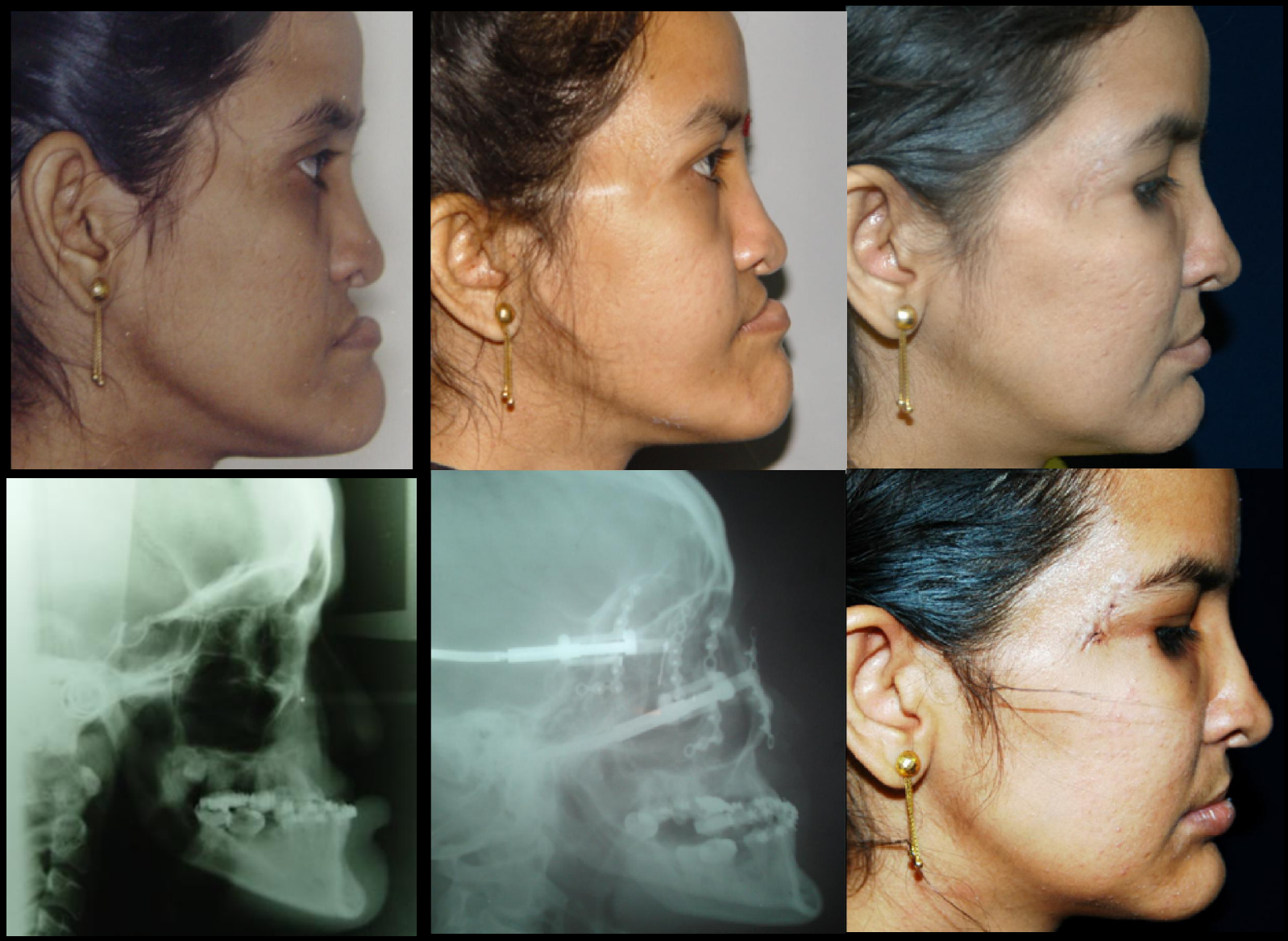
Different methods of distraction



Internal Push Distraction

Most suitable for forward movement of entire mid-face region

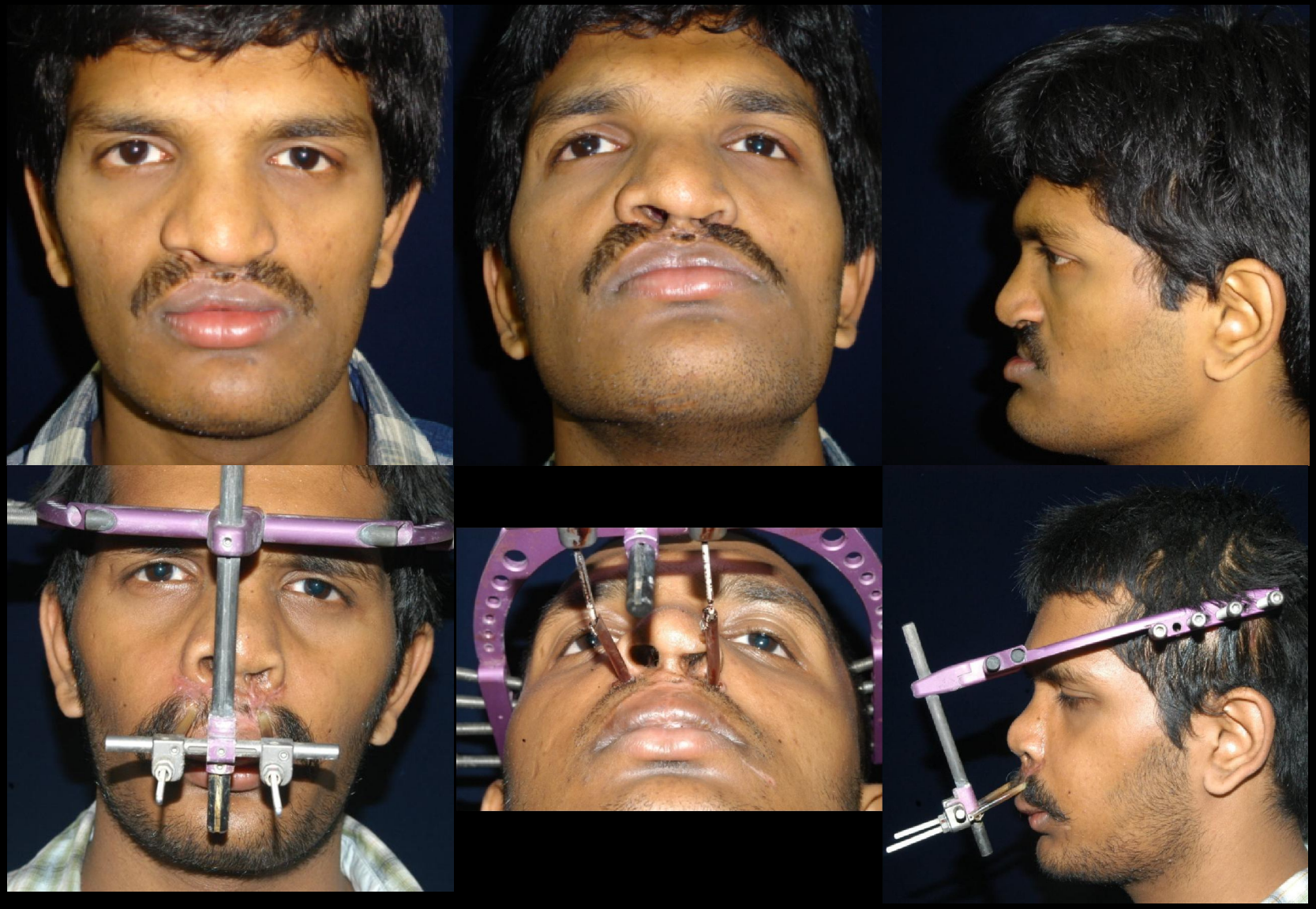
LeFort III Distraction



Distraction Protocol

- Latency period: 5 days following osteotomy and application of the device
- Active distraction: 1 mm per day
- Rigid retention: 0-8th week post-operatively
- Elastic retention (2 oz elastics): 9th-20th week post-operatively

Surgical Procedure Distraction

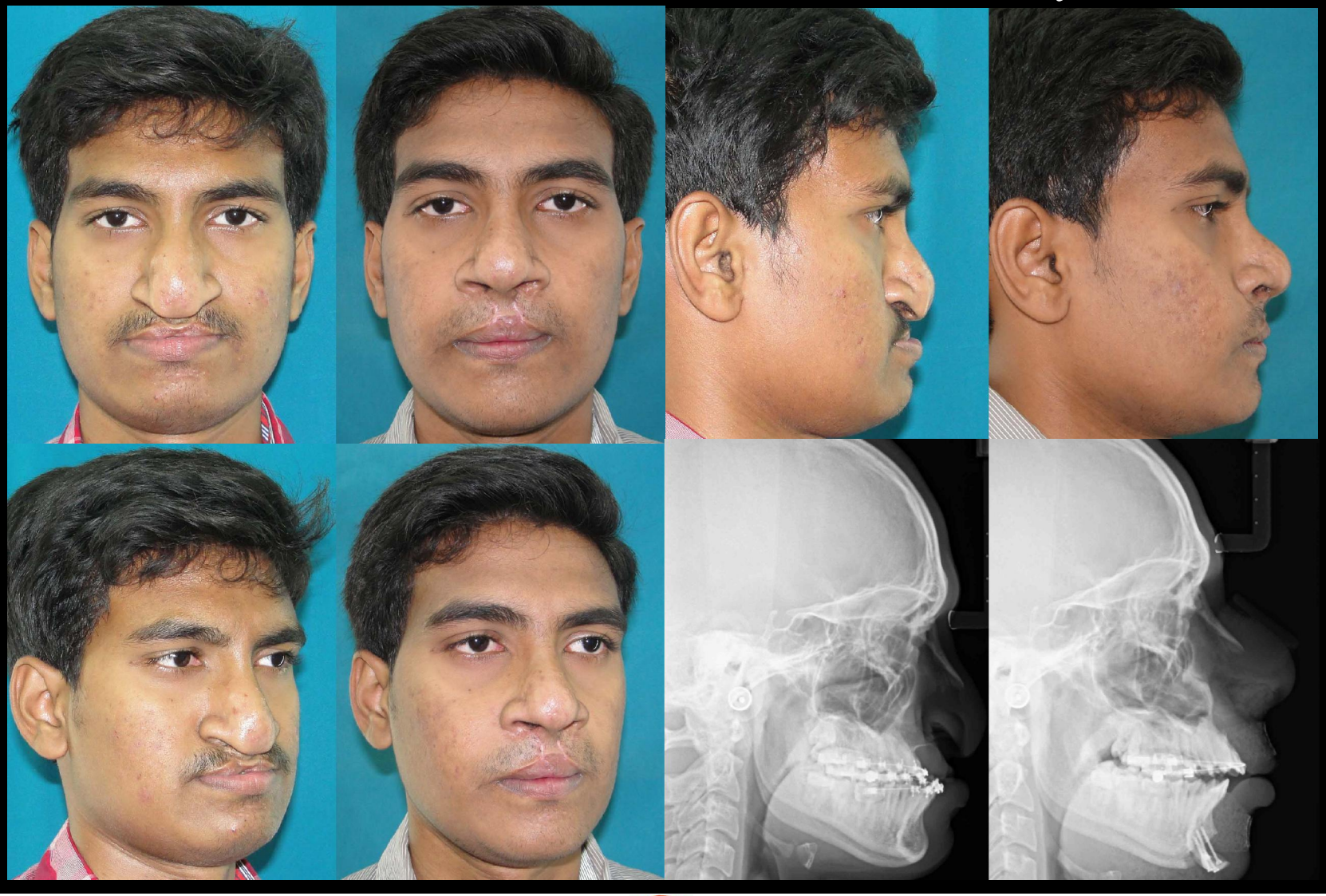


Surgical Procedure Distraction

Surgical Procedure Rhinoplasty

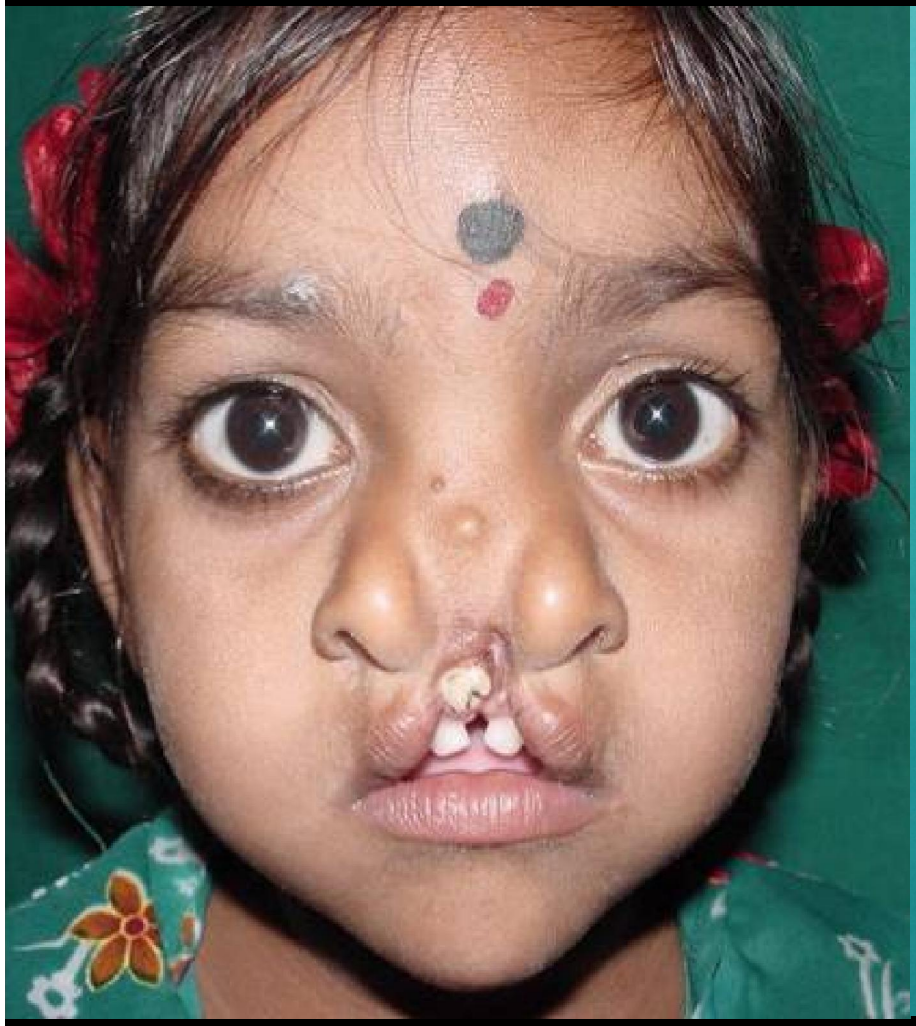
Surgical Procedure Distraction

If good orthodontics is done
LeFort I Maxillary Advancement, Genioplasty and Rhinoplasty with Lip Revision can all be done simultaneously



Orthodontist and Surgeon
Only team that works in managing the Cleft Maxilla

Bring the Smile Back



Thank You

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