# MORPHO-FUNCTIONAL CHEILOPLASTY FOR BILATERAL CLEFT LIP

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# Anatomy of Cleft Lip

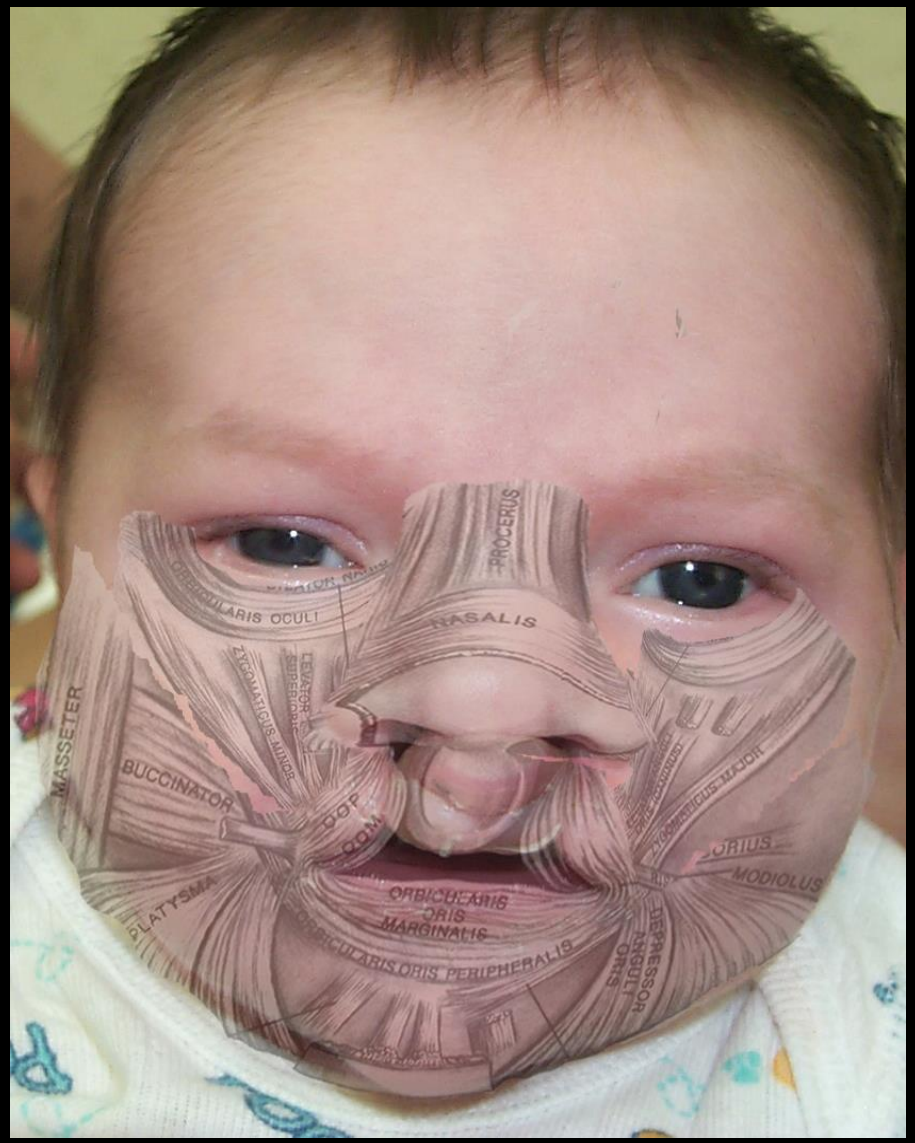
## Bilateral Cleft Lip

### Nasal

- Slumping of alar dome
- Lateral displacement ala
- Shortening of medial crus
- Displacement of septum
- Loss of overlap of upper and lower cartilages
- Loss of bony support

### Lip

- Discontinuity of orbicularis oris muscle
- Mal insertion of  other oral muscles
- Lip length discrepancy



# Incomplete or Partial Bilateral Cleft Lip

Symmetrical cleft involving vermillion and white roll of lip without involvement of nostrils (Type I a)

Symmetrical cleft involving vermillion and white roll of lip with involvementof nostrils (Type I b)

Asymmetrical cleft involvingvermillion and white roll of lip without involvement of nostrils (Type II a)

Asymmetrical cleft involving vermillion and white roll of lip with involvementof nostrils (Type II b)

# Complete Bilateral Cleft Lip

Bilateral cleft lip with symmetry:
Complete cleft on both sides (Type I a)

Bilateral cleft lip without symmetry:
Complete cleft on one side and incomplete cleft on the other (Type I b)

Premaxillawithin the confines of the arch
(Type II a)

Premaxilla protruding away/outsidefrom the arch (Type II b)

# Complete Bilateral Cleft Lip

Cleft lip with prolabial-columellar angle < 120° (Type III a)

Cleft lip with prolabial-columellar angle > 120° (Type III b)

Type I b, II b, III a complete bilateral cleft lip, alveolus, hard and soft palate (Complete cleft on both sides, with premaxilla protruding away from arch and prolabial-columellar angle < 120°)

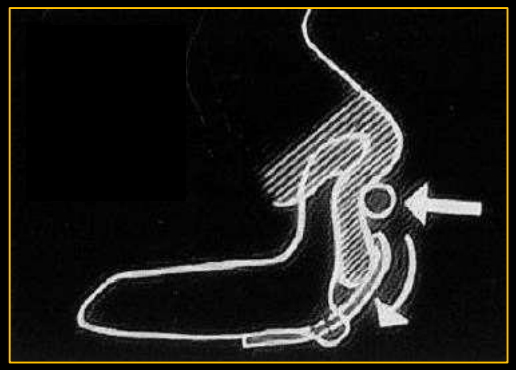
# Before primary lip repair (NAM)

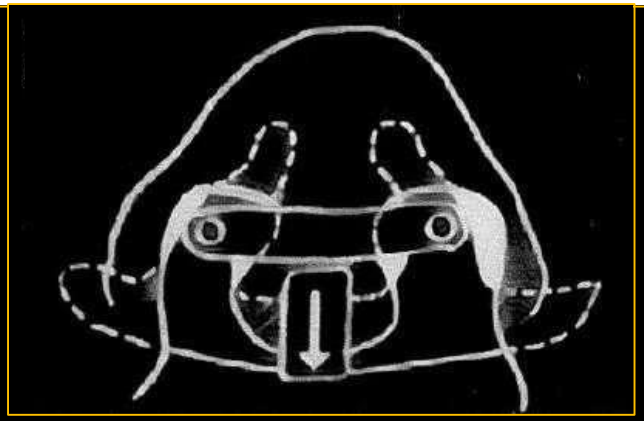
## Presurgical Nasoalveolar Orthopedic Molding in Primary Correction of the Nose, Lip, and Alveolus of Infants Born With Unilateral and Bilateral Clefts

BARRY H. GRAYSON, DDS
COURT B. CUTTING, M.D.

This addendum to the "State of the Art Dental Treatment of Predental and Infant Patients With Clefts and Craniofacial Anomalies," by Prahl-Andersen (*Cleft Palate Craniofac J.* 2000;37:528–532), offers an extended perspective on this controversial subject. This article reviews the role of combined nasal and alveolar (nasoalveolar) molding in the primary correction of the nose, lip, and alveolus of infants born with unilateral and bilateral clefts. The background of presurgical nasoalveolar orthopedic molding, the technique, and the literature are presented. The proposed benefits of treatment from the traditional techniques of presurgical orthopedics have been shown to be unsubstantiated (Kuijpers-Jagtman and Prahl, 1996). A close comparison of the proposed benefits of earlier forms of presurgical orthopedics, along with those of the current technique of nasoalveolar molding, is presented.

KEY WORDS: *bilateral unilateral cleft lip and palate, gingivoperiosteoplasty, nasal stent, nasoalveolar molding, nonsurgical columella elongation, presurgical orthopedics*





Presurgical Nasoalveolar Orthopedic Moulding in Primary Correction of the Nose, Lip, and Alveolus of Infants Born with Unilateral and Bilateral Clefts

Dr. Barry H. Grayson, DDS[,], Dr. Court B. Cutting, M.D. *The Cleft Palate-Craniofacial Journal* Vol38, Issue 3, pp 193 – 198, May.2001

In our nearly 30 years of practice as a high-volume comprehensive cleft and craniomaxillofacial care centre in Southern India“No NAM device” was used since 1996 to 2021

We achieved remarkable and stable long-term surgical outcomes. Our morpho-functional approach to lip and nose repair, utilizing the Afroze incision, has proven sufficient for achieving excellent lip and nose outcomes.

Since 2021, we have started using passive plate with nasal elevator. We changed our protocol to get a better nasal contour.

## OLD PROTOCOL

- Primary Cheiloplasty + perialveoloplasty and septoplasty : 4months of age: Morphofunctional cleft lip repair
- Primary palatoplasty : 1 year of age : Bardach's two flap technique modified Furlow's with levator myoplasty / furlow's double opposing Z plasty
- Speech Therapy : 4-10 years of age
- SABG : >8 years of age
- Orthodontic treatment : >12 years of age
- OGS : If required : >16 years of age
- Rhinoplasty : >16 years of age
- Hair transplantation – for Male patients

## NEW PROTOCOL

- Pre surgical : Passive Plate + Nasal elevator
- Primary Cheiloplasty : 4months of age :Morphofunctional cleft lip repair with gingivoperiosteoplasty
- 6 months of post operative nasal stenting
- Primary palatoplasty : 1 year of age : Bardach's two flap technique/ modified Furlow's with levator myoplasty / furlow's double opposing Z plasty
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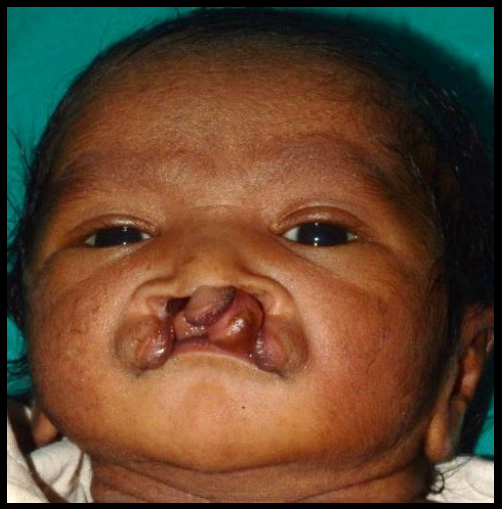
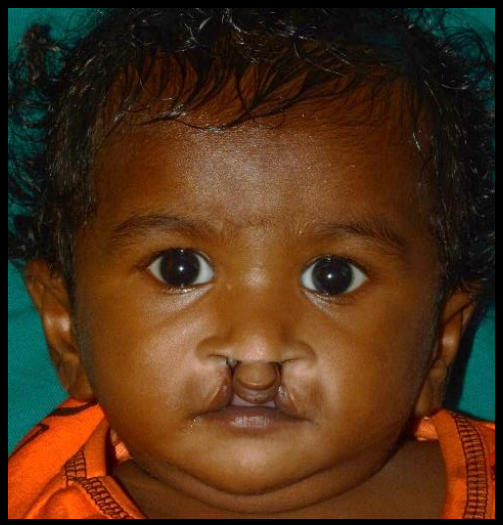
# Presurgical Naso-alveolar Moulding

Pre NAM

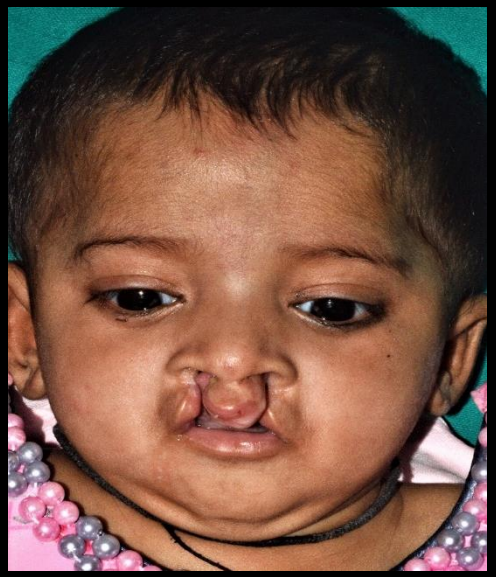
Post NAM

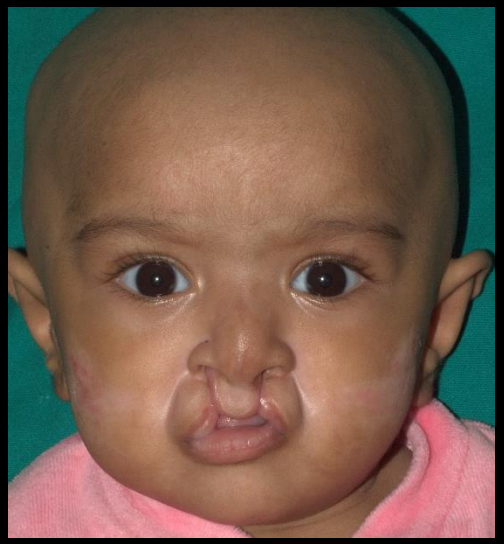




Pre NAM

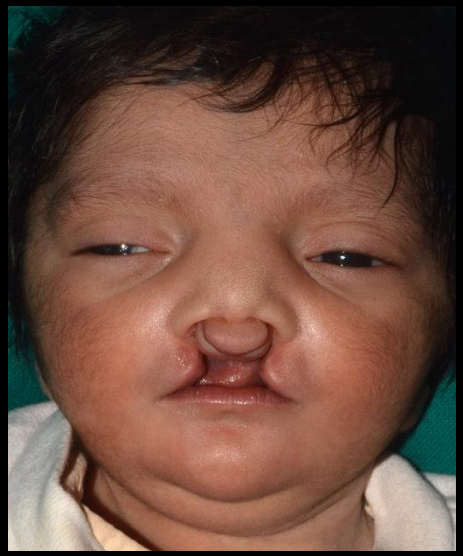
Post NAM

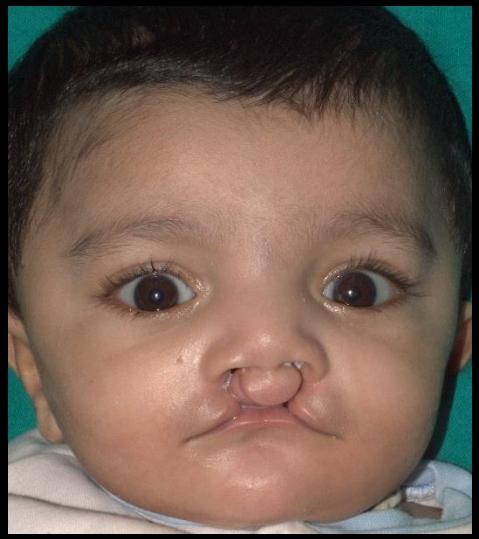


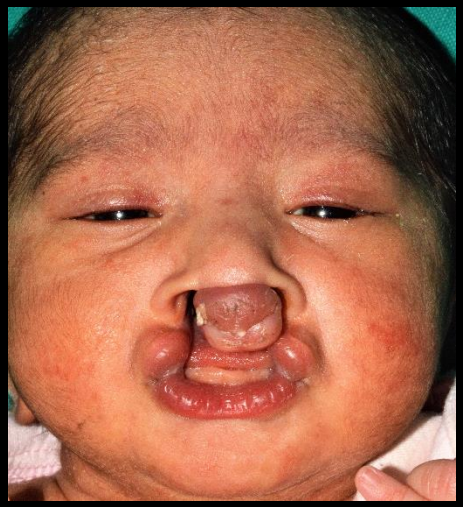


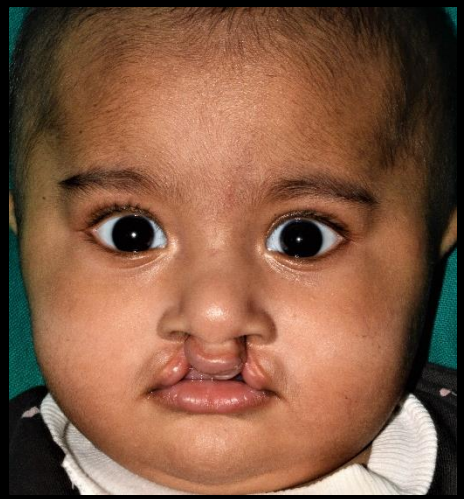
Pre NAM

Post NAM



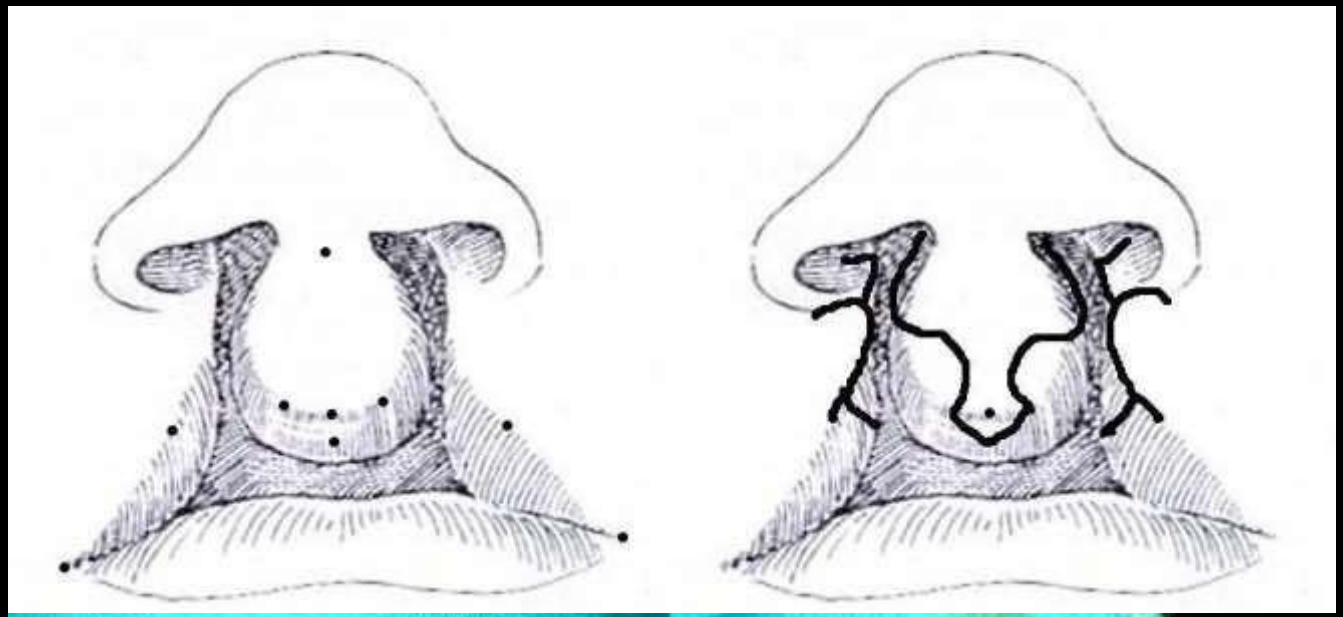




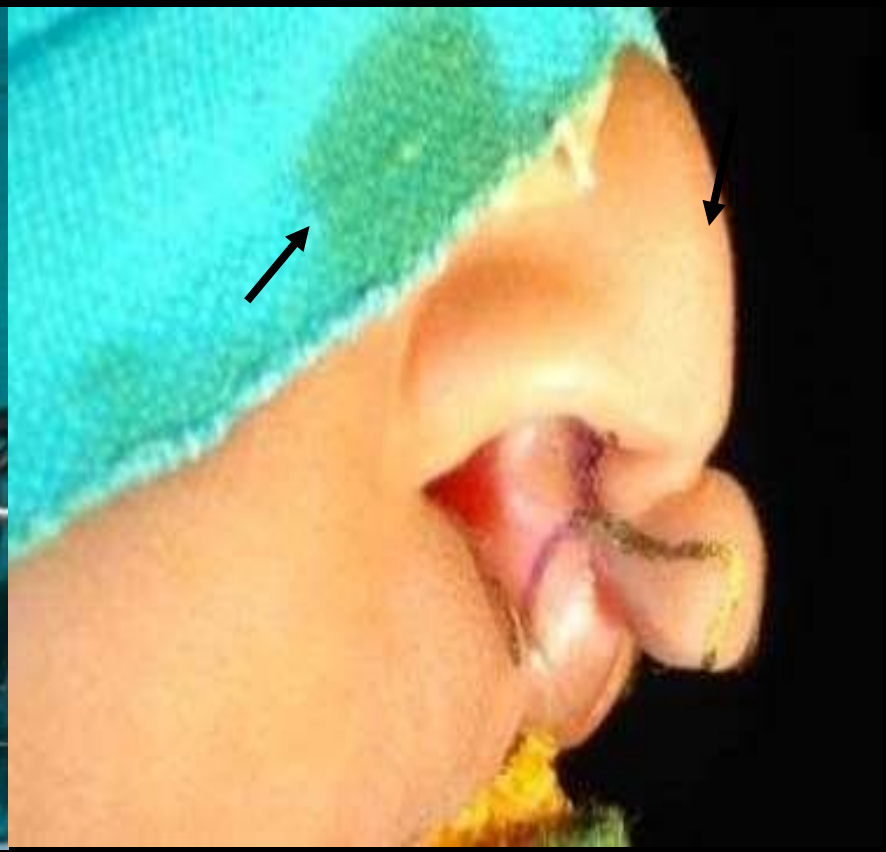


# Bilateral Cleft Lip Repair

Incision design for bilateral cleft lip surgery

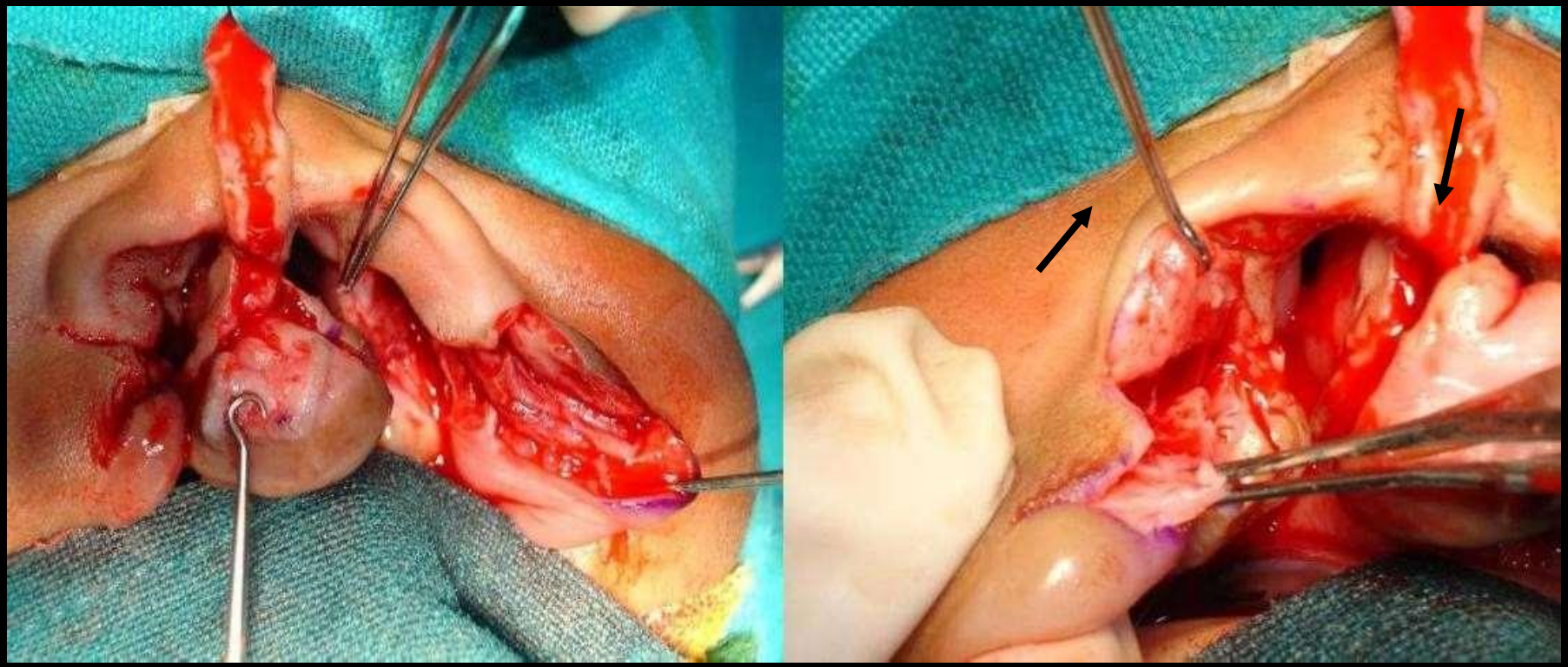


# Bilateral Cleft Lip Repair



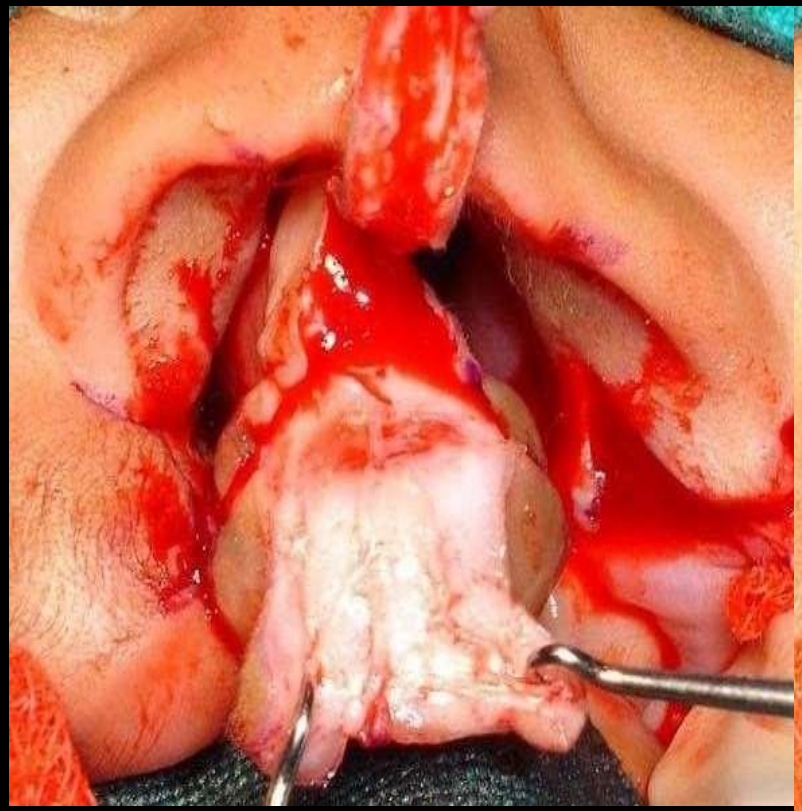
Afroze Incision

# Bilateral Cleft Lip Repair



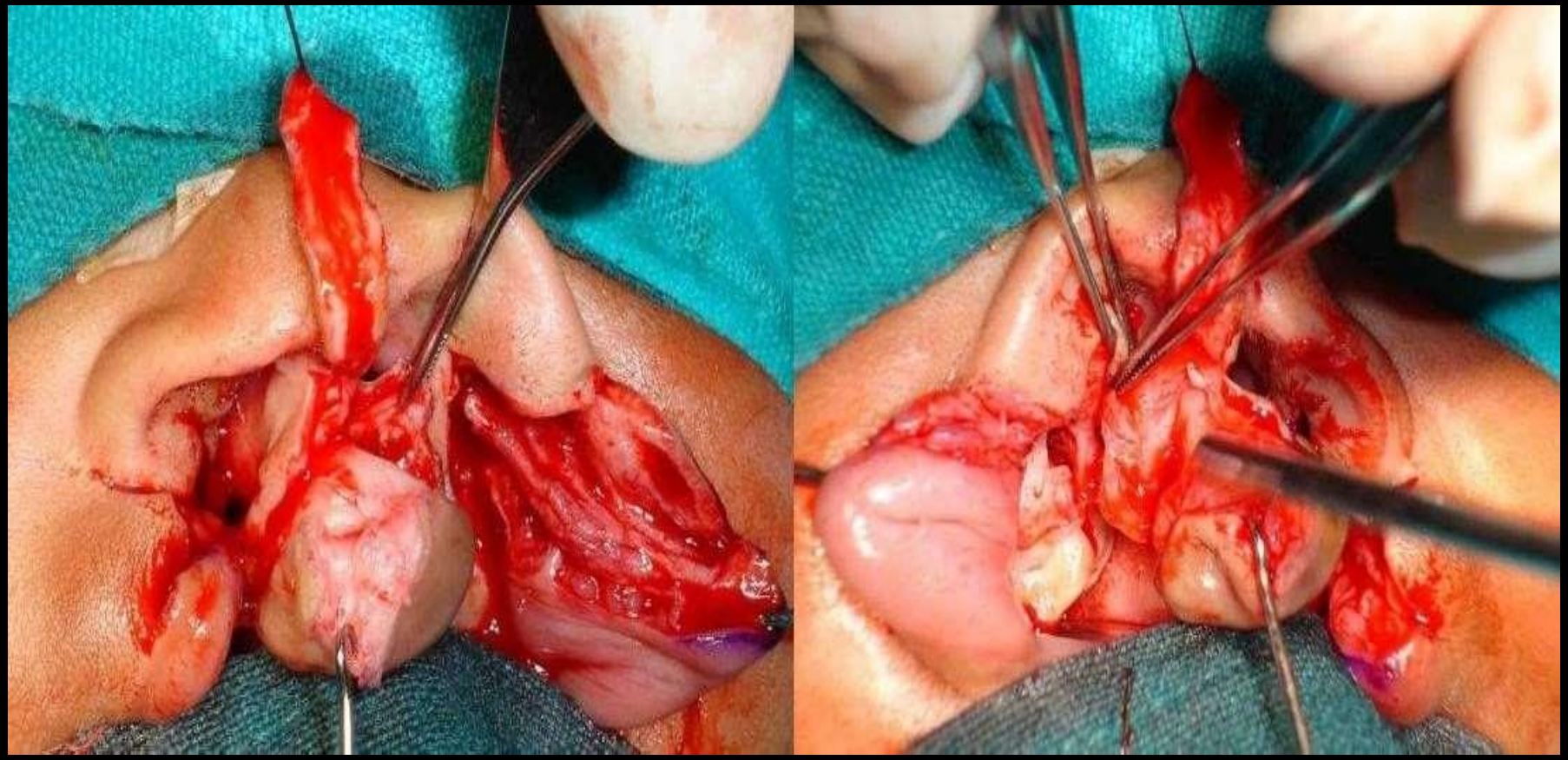
Minimal muscle dissection ensuring dissection of transverse nasalis muscle

# Bilateral Cleft Lip Repair



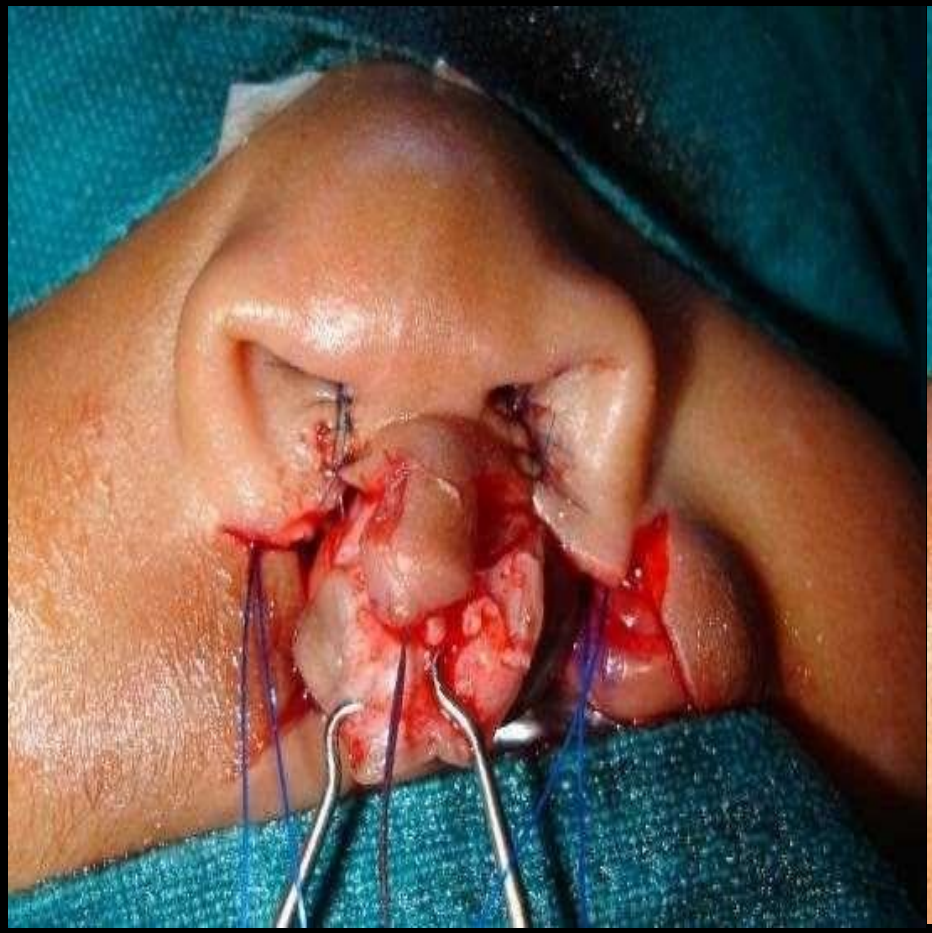
Dissection of the prolabium is done to separate vestibular mucosa from skin. All the fibro-adipose tissue is removed and the vestibular mucosa is trimmed

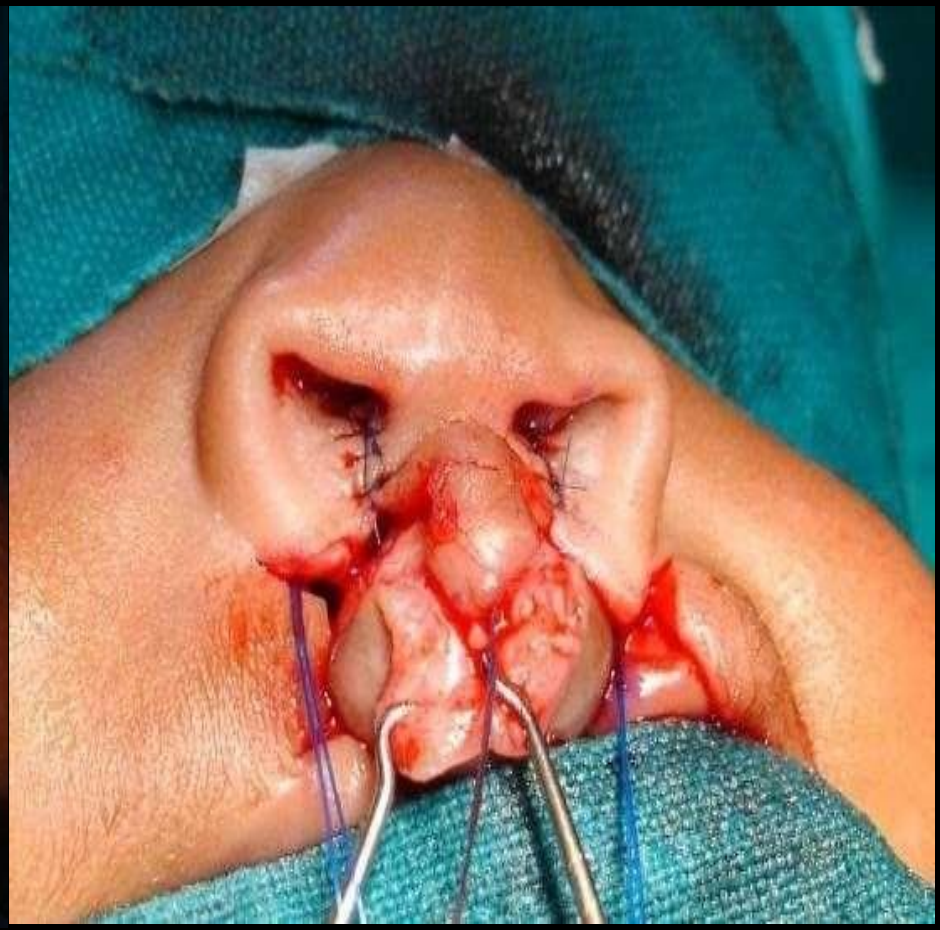
# Bilateral Cleft Lip Repair



Periosteoplasty is done in patients who have associated cleft alveolus and/or cleft palate. It is done to receive the bone graft later on and to minimize the formation of “Y” junction fistula

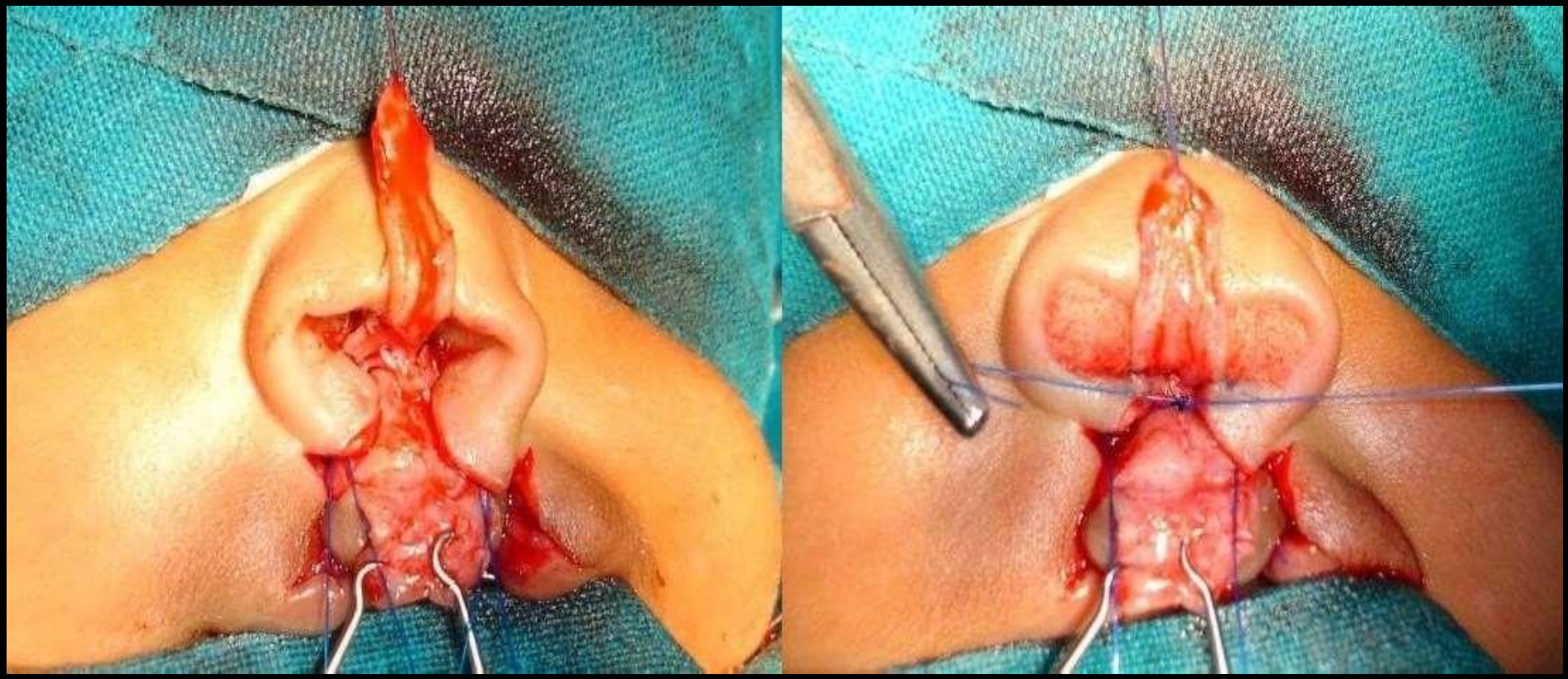
# Bilateral Cleft Lip Repair





Nasal sill is closed bilaterally

# Bilateral Cleft Lip Repair



Ala of the nose is stabilized syymetrically.

# Bilateral Cleft Lip Repair

Prolabial-Columellar Angle >120°

Vestibule formed with tissue from prolabium and corresponding labial mucosa

Prolabial-Columellar Angle <120°

Tissue from prolabium is sutured to premaxilla

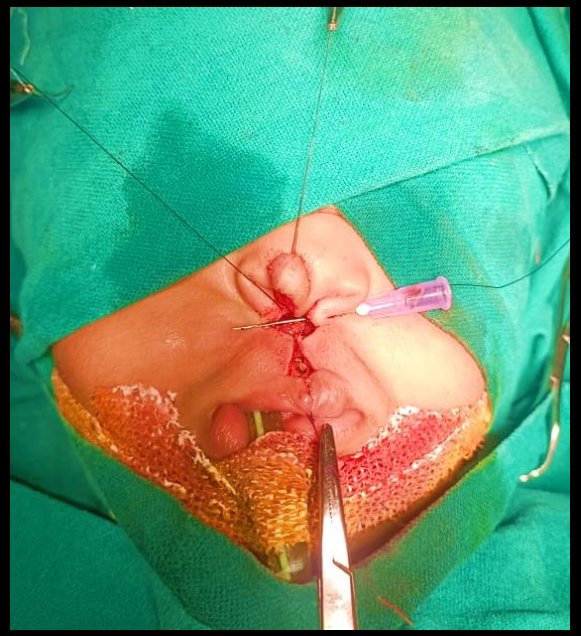
Vestibule formed by closing both side labial mucosa

# Bilateral Cleft Lip Repair

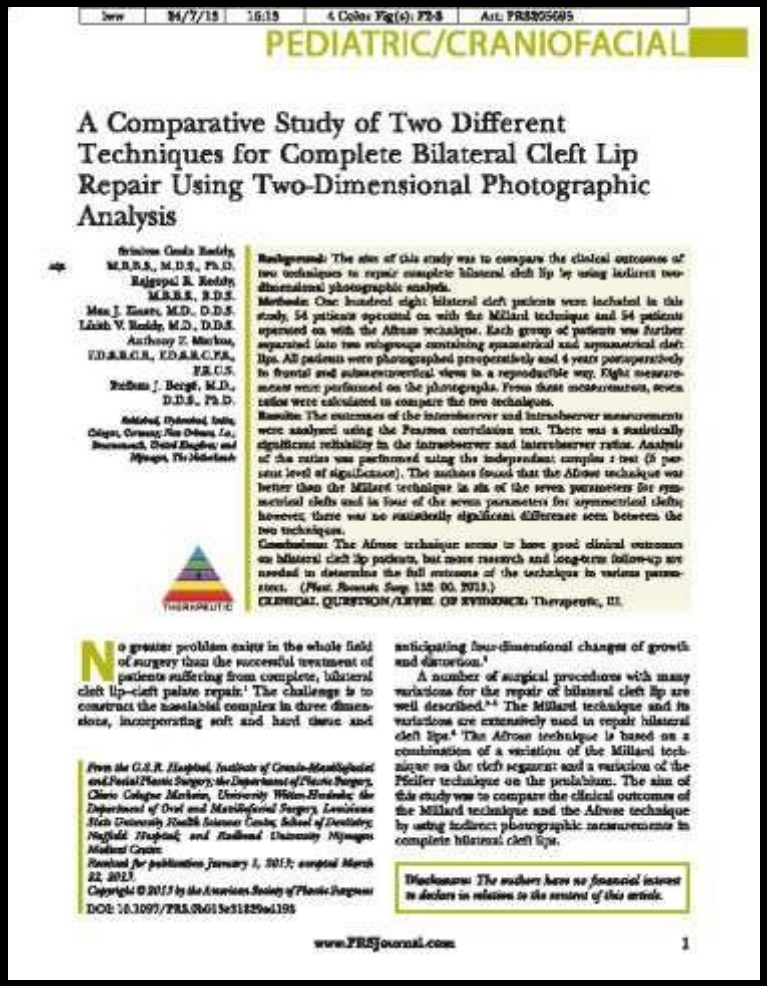
Muscle approximation and closure is done

# EVOLUTION OF OUR TECHNIQUE

| PROCEDURE | DRAWBACKS | CHANGES INCORPORATED |
|---|---|---|
| Primary cheiloplasty | To lift the alar base | Alar suspension suture using needle |
| Patients treated with NAM device | | Gingivoperiosteoplasty |



# 2 Dimensional Photographic Analysis



PEDIATRIC/CRANIOFACIAL

## A Comparative Study of Two Different Techniques for Complete Bilateral Cleft Lip Repair Using Two-Dimensional Photographic Analysis

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Rajagopal R. Reddy, M.B.B.S., D.D.S.
Max J. Stauss, M.D., D.D.S.
Lilith V. Reddy, M.D., D.D.S.
Anthony T. Markus, F.D.S.R.C.S., F.D.S.R.C.P.S., F.R.C.S.
Willem J. Bergé, M.D., D.D.S., Ph.D.

Hyderabad, Hyderabad, India; Cologne, Germany; San Antonio, Texas; Bournemouth, United Kingdom; and Nijmegen, The Netherlands

**Background:** The aim of this study was to compare the clinical outcomes of two techniques to repair complete bilateral cleft lip by using indirect two-dimensional photographic analysis.

**Methods:** One hundred eight bilateral cleft patients were included in this study. 54 patients operated on with the Millard technique and 54 patients operated on with the Afrose technique. Each group of patients was further separated into two subgroups containing symmetrical and asymmetrical cleft lips. All patients were photographed preoperatively and 4 years postoperatively in frontal and submentovertical views in a reproducible way. Eight measurements were performed on the photographs. From these measurements, seven ratios were calculated to compare the two techniques.

**Results:** The outcomes of the intraobserver and interobserver measurements were analyzed using the Pearson correlation test. There was a statistically significant reliability in the intraobserver and interobserver ratios. Analysis of the ratios was performed using the independent samples *t* test (5 percent level of significance). The authors found that the Afrose technique was better than the Millard technique in six of the seven parameters for symmetrical clefts and in four of the seven parameters for asymmetrical clefts; however, there was no statistically significant difference seen between the two techniques.

**Conclusions:** The Afrose technique seems to have good clinical outcomes in bilateral cleft lip patients, but more research and long-term follow-up are needed to determine the full outcomes of the technique in various parameters. (*Plast. Reconstr. Surg.* 132: 00, 2013.)

CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, III.

No greater problem exists in the whole field of surgery than the successful treatment of patients suffering from complete, bilateral cleft lip–cleft palate repair.[1] The challenge is to construct the nasolabial complex in three dimensions, incorporating soft and hard tissue and anticipating four-dimensional changes of growth and distortion.[2]

A number of surgical procedures with many variations for the repair of bilateral cleft lip are well described.[3–5] The Millard technique and its variations are extensively used to repair bilateral cleft lips.[4] The Afrose technique is based on a combination of a variation of the Millard technique on the cleft segment and a variation of the Pfeifer technique on the prolabium. The aim of this study was to compare the clinical outcomes of the Millard technique and the Afrose technique by using indirect photographic measurements in complete bilateral cleft lips.

*From the G.S.R. Hospital, Institute of Cranio-Maxillofacial and Facial Plastic Surgery; the Department of Plastic Surgery, Clinic Cologne Merheim, University Witten-Herdecke; the Department of Oral and Maxillofacial Surgery, Louisiana State University Health Sciences Center, School of Dentistry; Nuffield Hospital; and Radboud University Nijmegen Medical Center.*

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**Disclosure:** *The authors have no financial interest to declare in relation to the content of this article.*



A comparative study of two different techniques for complete bilateral cleft lip repair using two-dimensional photographic analysis

Plastic and Reconstructive Surgery 2013

# 2 Dimensional Photographic Analysis

Results

SYMMETRICALBILATERALLIP

- Difference, statistically not significant (Afroze group better)

  Labial, nasal, and nostril symmetry

- Difference, statistically not significant (Millard group better)

  Vermillion symmetry

ASYMMETRICALBILATERALLIP

- Difference, statistically not significant (Afroze group better)

  Labial and nasal symmetry

- Difference, statistically not significant (Millard group better)

  Vermillion symmetry

Conclusion

The Afroze technique seems to have good clinical outcomes on bilateral cleft lip patients, although there were no statistical differences between the two techniques

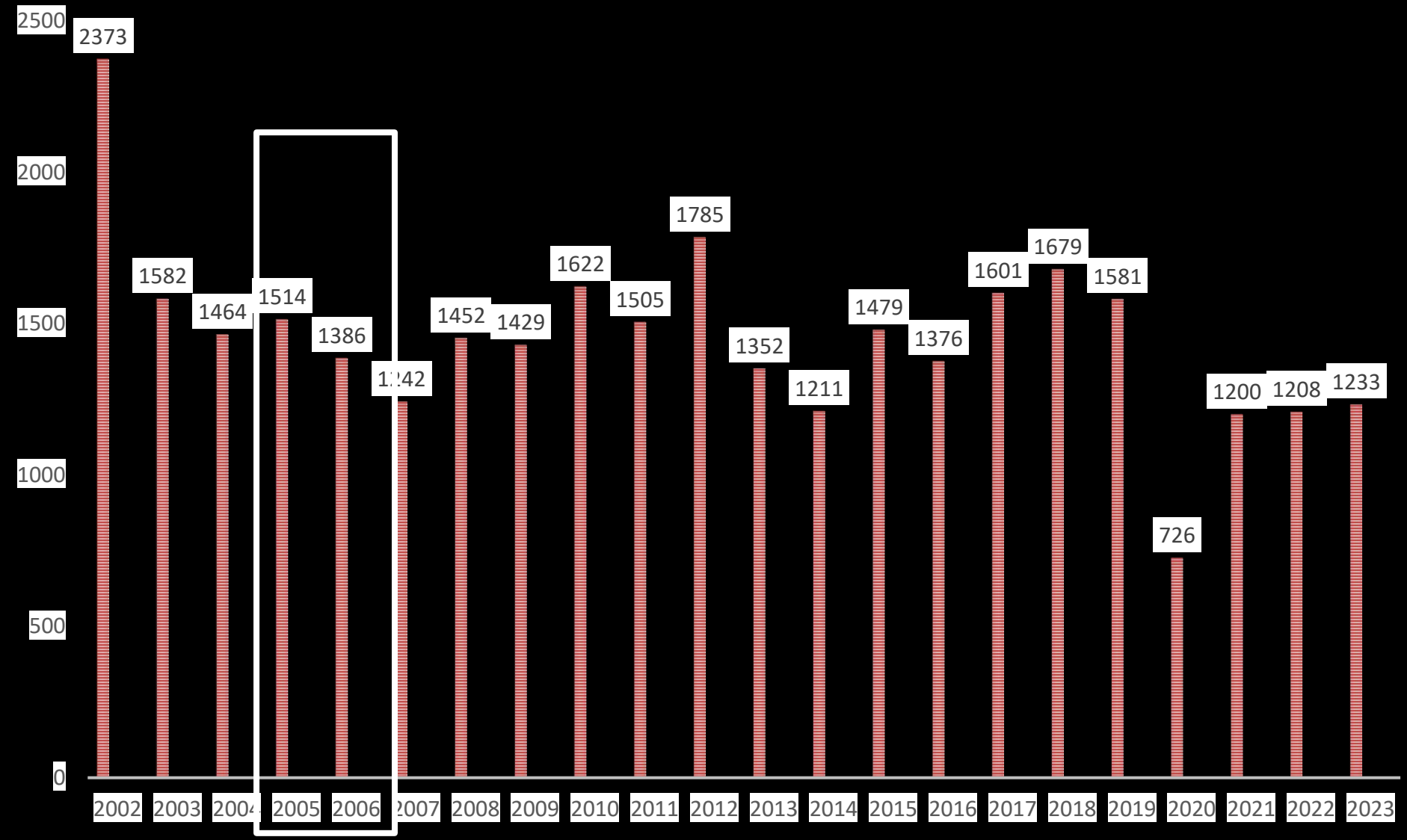
Source:
Gosla Reddy S, et al A comparative study of two different techniques for complete bilateral cleft lip repair using two-dimensional photographic analysis. Plastic and Reconstructive Surgery, 2013

# ANALYSIS OF OUR OUTCOMES

Growth in 100 consecutive patients with bilateral cleft lip and palate operated for primary cheiloplasty and one stage primary palatoplasty in the year 2005 and 2006 were analyzed over a minimum period of 18 years

Lateral cephalogram, upper and lower arch dental models and speech samples were collected to evaluate the facial growth and to assess the speech outcome.

All the 100 patients were assessed by 2 experienced surgeons as inter and intra observers along with an orthodontist and a speech pathologist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2021
2022
2023

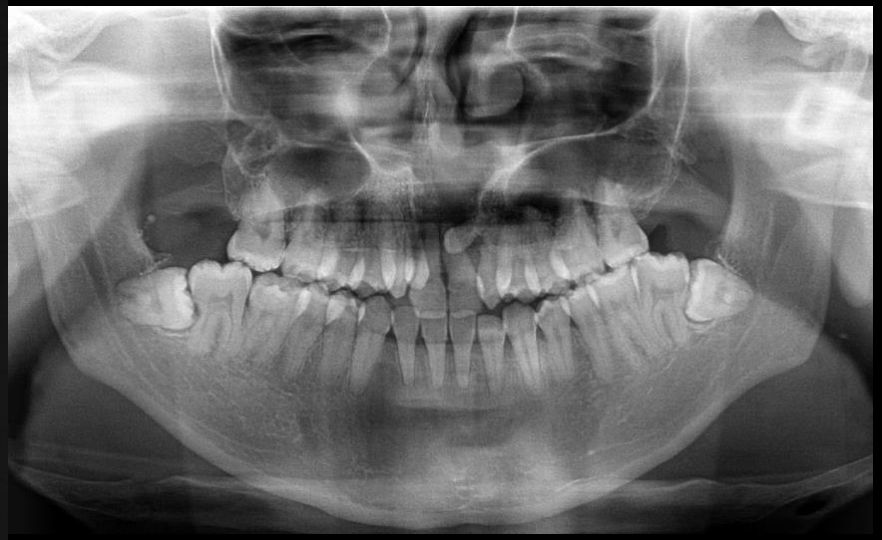
Patient 1

After 18 Yrs


Procedures Undergone:

1. Primary Cheiloplasty
2. Primary Palatoplasty
3. Speech therapy
4. SABG
5. Rhinoplasty

# RADIOGRAPHS SHOWING NO GROWTH DEFICIENCY

# SPEECH SAMPLE EXHIBITING GOOD SPEECH INTELLIGIBILITY

Patient 2

After 18 Yrs

Procedures Undergone:

1. Primary Cheiloplasty
2. Primary Palatoplasty
3. Speech therapy
4. SABG
5. Rhinoplasty
6. Ongoing removable orthodontics

# RADIOGRAPHS SHOWING NO GROWTH DEFICIENCY

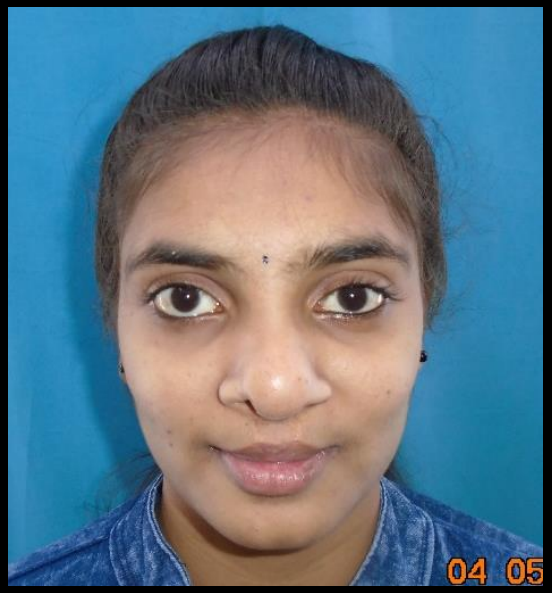

# SPEECH SAMPLE EXHIBITING GOOD SPEECH INTELLIGIBILITY

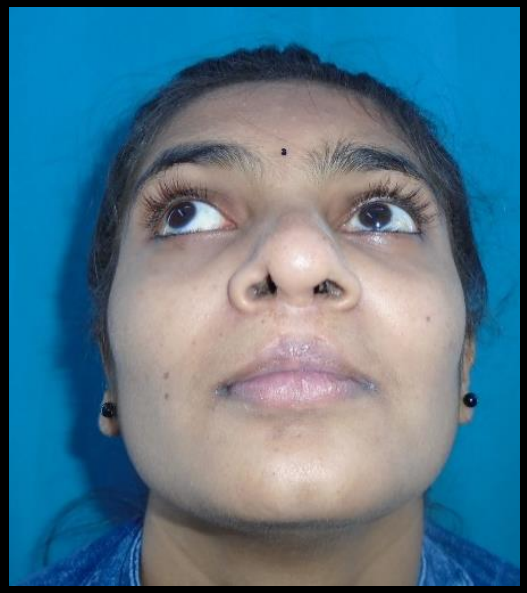
Patient 3






After 18 Yrs

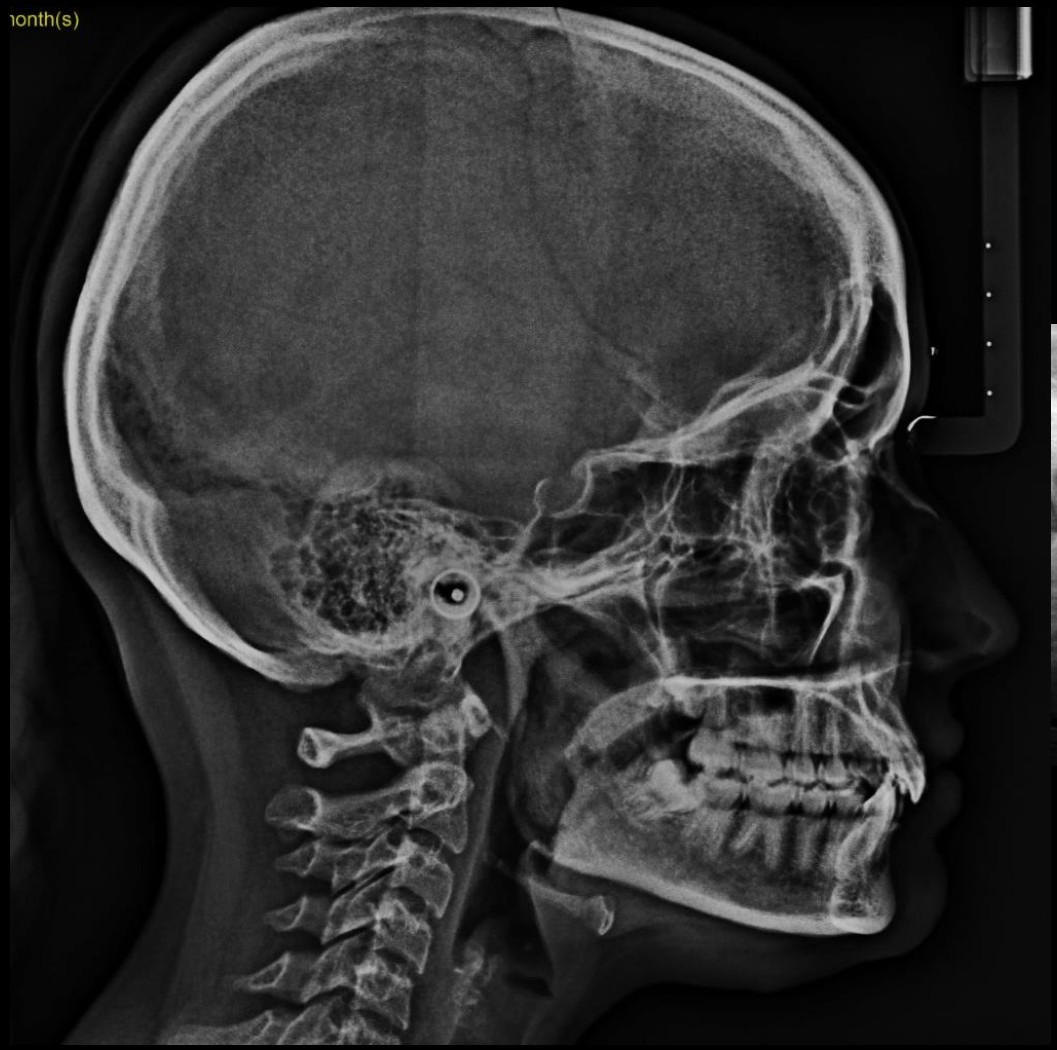


Procedures Undergone:

1. Primary Cheiloplasty
2. Primary Palatoplasty
3. Speech therapy
4. SABG
5. Rhinoplasty

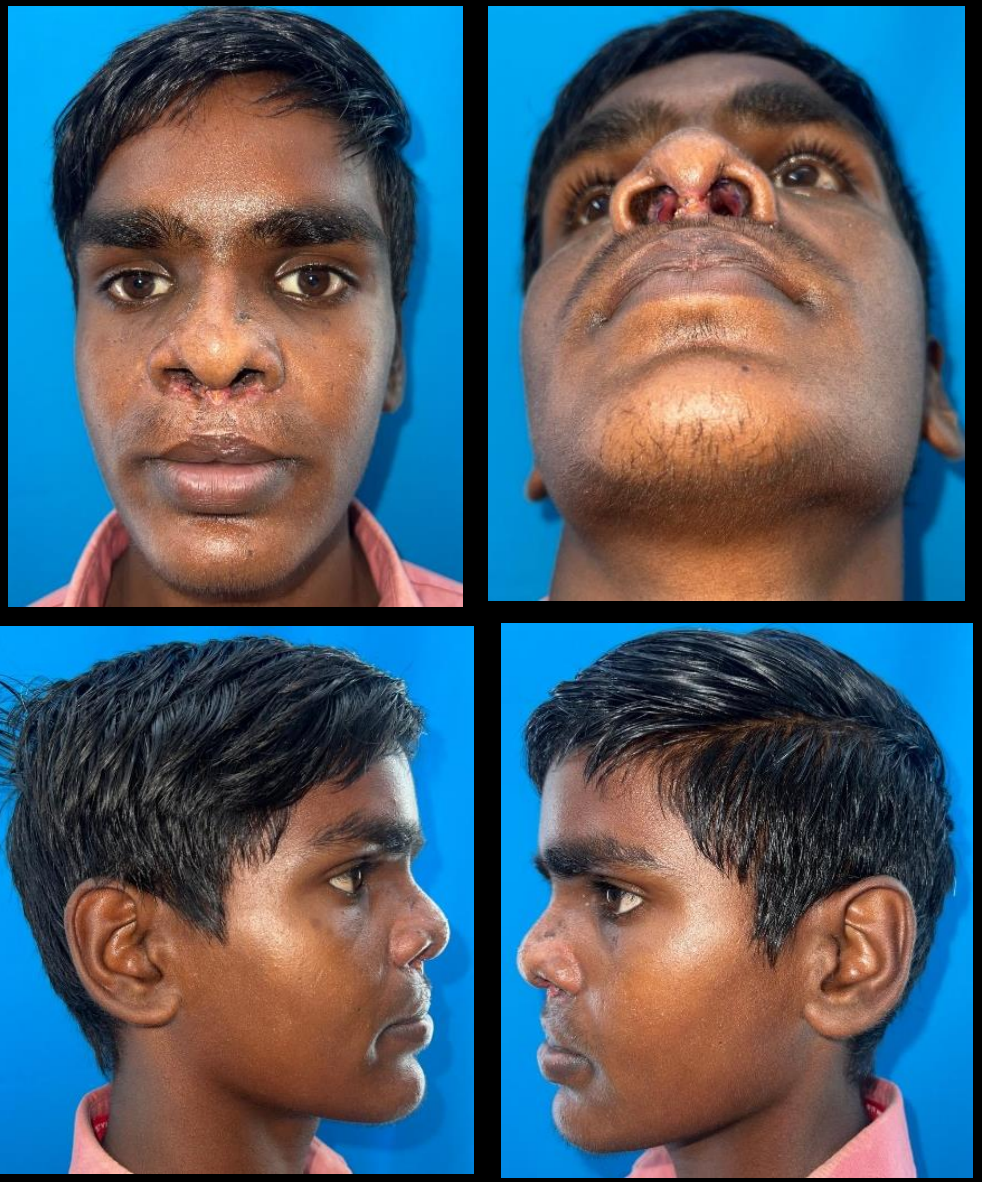
# RADIOGRAPHS SHOWING NO GROWTH DEFICIENCY




# SPEECH SAMPLE EXHIBITING GOOD SPEECH INTELLIGIBILITY

Patient 4

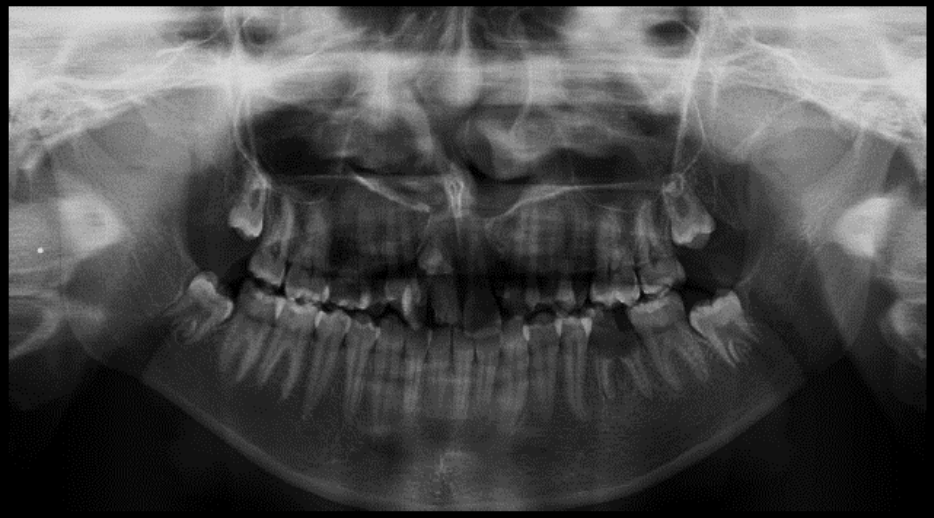
After 18 Yrs



Procedures Undergone:

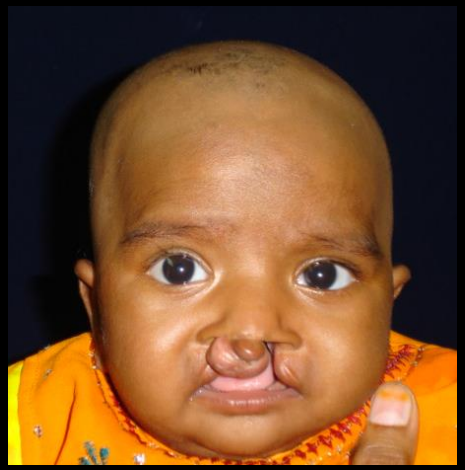
1. Primary Cheiloplasty
2. Primary Palatoplasty
3. Speech therapy
4. SABG
5. Rhinoplasty

# RADIOGRAPHS SHOWING NO GROWTH DEFICIENCY



# SPEECH SAMPLE EXHIBITING GOOD SPEECH INTELLIGIBILITY

Patient 5






After 18 Yrs



Procedures Undergone:

1. Primary Cheiloplasty
2. Primary Palatoplasty
3. Speech therapy
4. SABG
5. Rhinoplasty

# RADIOGRAPHS SHOWING MINIMAL GROWTH DEFICIENCY


# SPEECH SAMPLE EXHIBITING GOOD SPEECH INTELLIGIBILITY

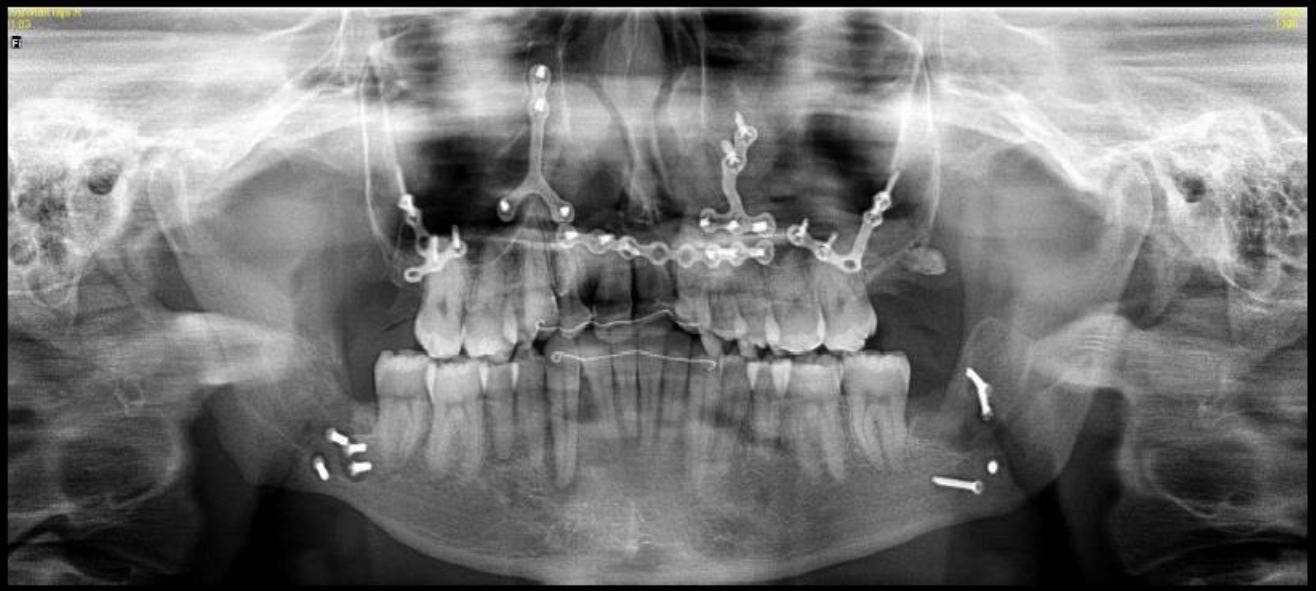
Patient 6

AFTER 18 Yrs

Patient presenting with midface deficiency

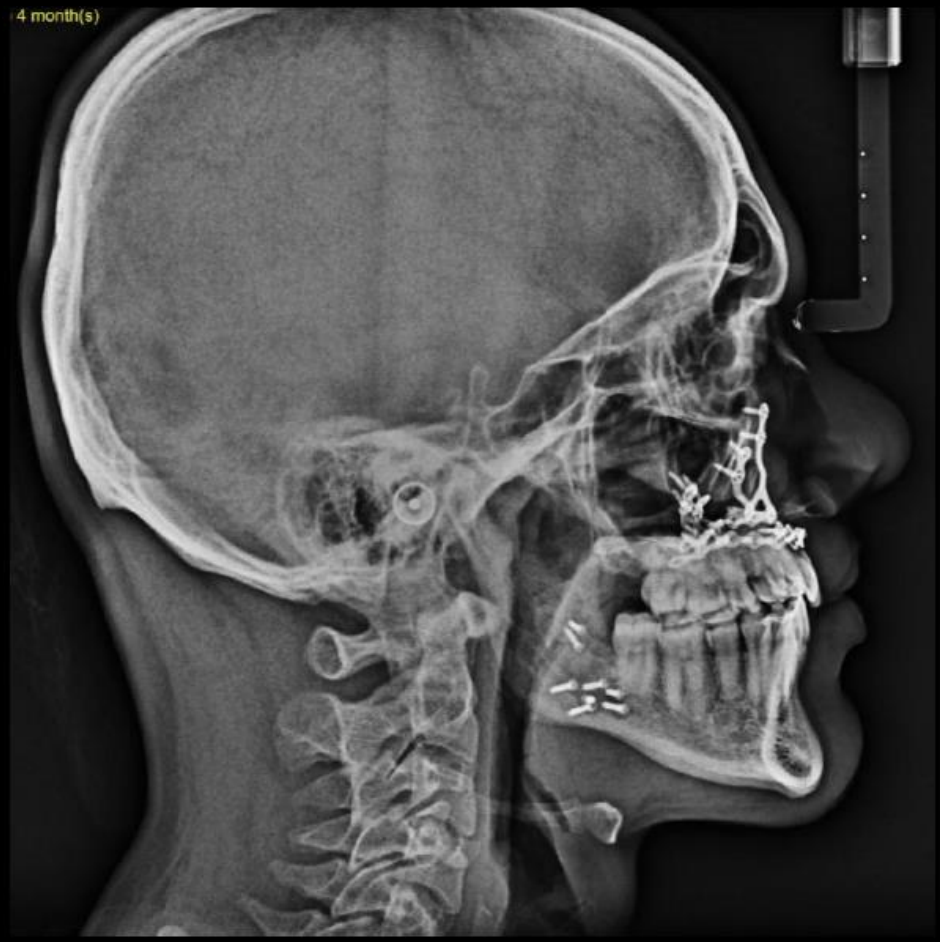
PRE OP OPG

POST OP OPG

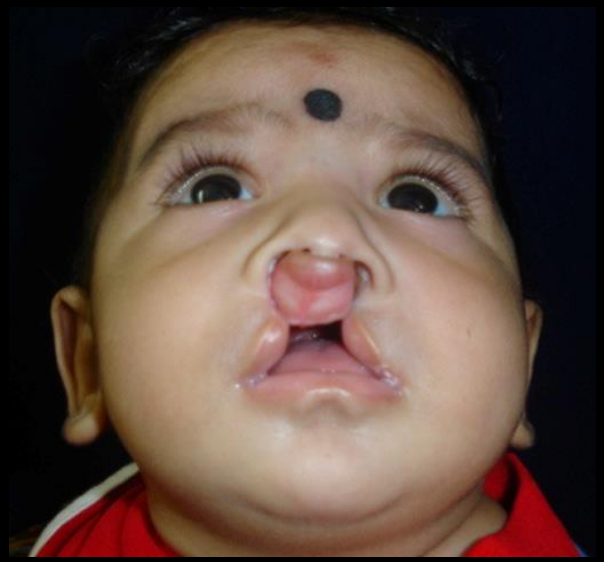


PRE OP LATERAL CEPH

POST OP LATERAL CEPH

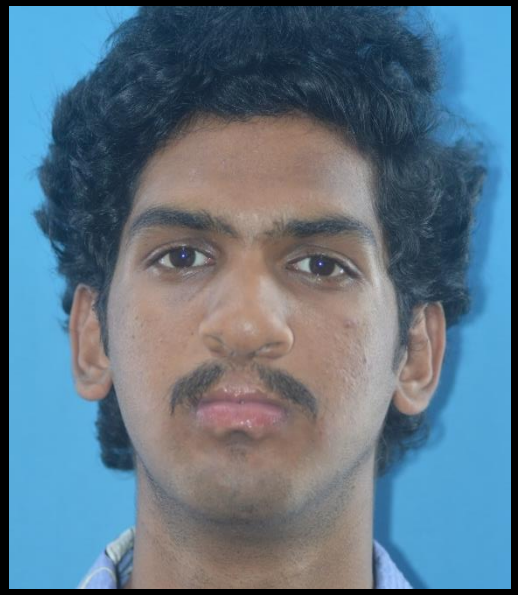


Patient 7

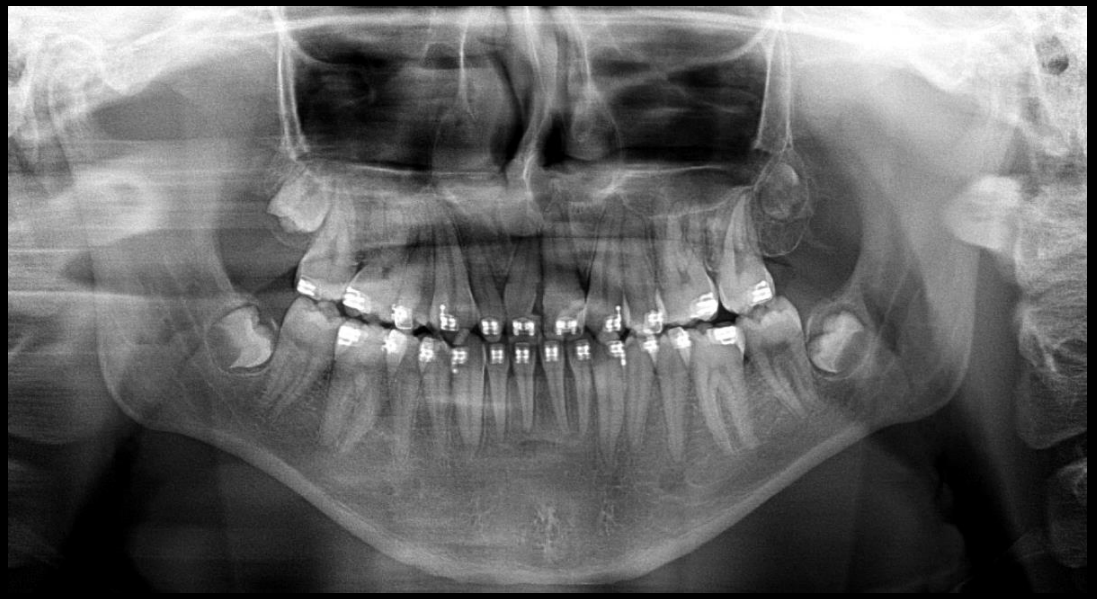


AFTER 18 Yrs

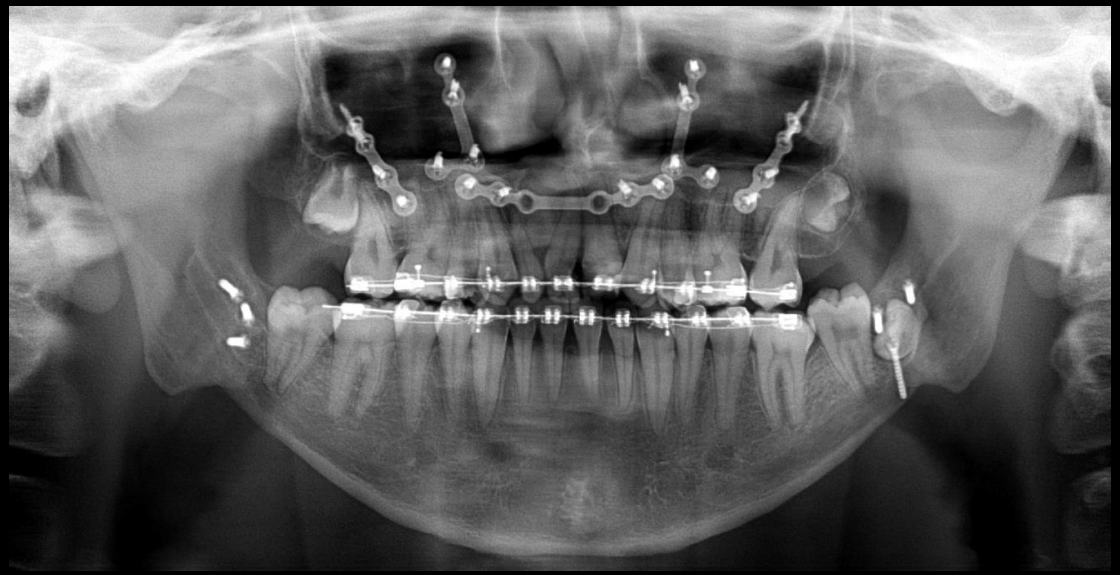
Patient presenting with midface deficiency




PRE OP OPG



POST OP OPG



PRE OP LATERAL CEPH

POST OP LATERAL CEPH

# GOSLON'S INDEX

**Table 1.** GOSLON five group's description.

| Group | Description | Long-term outcome |
|---|---|---|
| Group 1 | Positive overjet with average inclined or retroclined incisors with no crossbite or open bite. | Excellent |
| Group 2 | Positive overjet with average inclined or proclined incisors with unilateral crossbite or crossbite tendency with or without open bite tendency around the cleft site. | Good |
| Group 3 | Edge-to-edge bite with average inclined or proclined incisors or reverse overjet with retroclined incisors. Unilateral crossbite with or without open bite tendency around the cleft site. | Fair |
| Group 4 | Reverse overjet with average inclined or proclined incisors. Unilateral crossbite with or without bilateral crossbite tendency with or without open bite tendency around the cleft site. | Poor |
| Group 5 | Reverse overjet with proclined incisors, bilateral crossbite, and poor maxillary arch form and palatal vault anatomy. | Very poor |

# OBSERVATION AND CONCLUSION

Out of the 100 patients operated for cleft lip and palate the outcome was as follows:

5% : Very Poor
10% : Poor
15% : Fair
35% : Good
35% : Excellent

# OBSERVATION AND CONCLUSION

Morpho-functional cleft repair addresses the issues with premaxillary protrusion and also helps in columellar elongation.

Our long term follow ups signifies that Maxillary growth and speech of the patients were near normal

# Bring the Smile Back

# Thank You

# Bring the Smile Back

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