MORPHO – FUNCTIONAL CHEILOPLASTY FOR UNILATERAL CLEFT LIP

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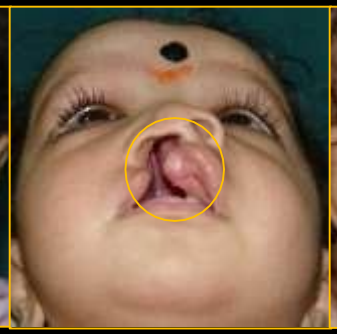
GSR Institute of Facial Plastic Surgery

- Non-profit hospital established in 1996
- Dedicated Cleft & Craniofacial Centre of Excellence
- Presently 1,600 cleft and cranio-facial surgeries are done every year
- 4 surgeons and 6 fellows with full support team
- More than 4 0,000 documented cleft & craniofacial surgeries have been performed since 1996
- 600 primary new born cleft children are registered every year

Unilateral Cleft Lip Defect
A 3-Dimensional Problem








Oral

- Discontinuity and mal insertion of Orbicularis oris muscle causing horizontal and vertical lip length discrepancy

Nasal

- Deformity of nasal form caused due to mal insertion of Nasalis and other oro-nasal muscles

- Displacement of septum

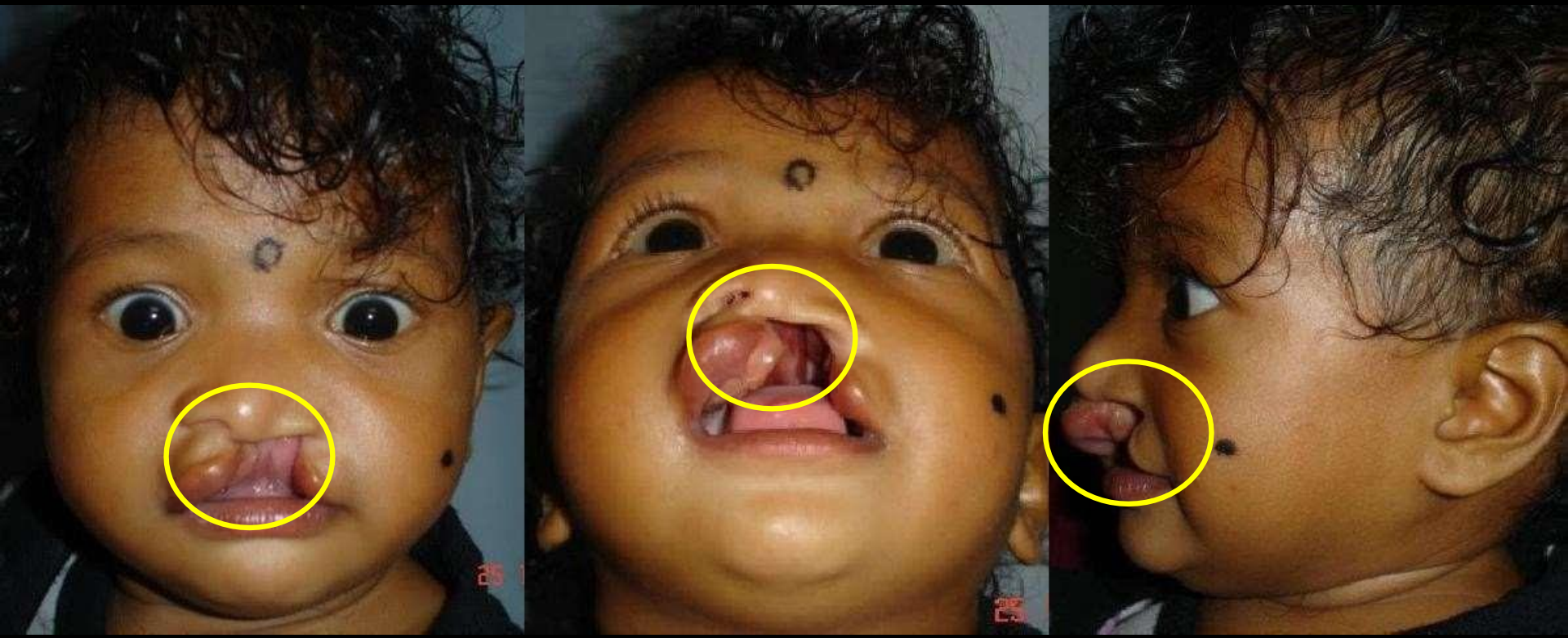
Alveolar

- Loss of bony support

Markus, A. F.,and Delaire, J. Functional primary closure of cleft lip. Br. J. Oral Maxillofac. Surg. 31: 281, 1993

Unilateral Cleft Lip Defect

Is the morphology of the unilateral cleft lip defect the same in all patients?



Complete Unilateral Cleft Lip

Without Simonart's band (Type I a)

With Simonart's band (Type I b)

Without complete collapse of nasal dome and ala (Type II a)

With completecollapse of nasal dome and ala (Type II b)

Complete Unilateral Cleft Lip

Without difference in level of alveolar ridges (Type III a)

With difference in level of alveolar ridges (Type III b)

Problems of Wide Clefts

- Differential height of the alveolar segments.
- Variations in the horizontal width of the segments.
- Inward turning of the Cupid's bow towards Columellar base on non cleft side.
- Leading to Severe shortening of skin for Millard rotation.
- Shortening of vertical Height on cleft side and retraction of tissue into the nasal web.
- Collapsed of the nasal dome and severe deviation of nasal septum.

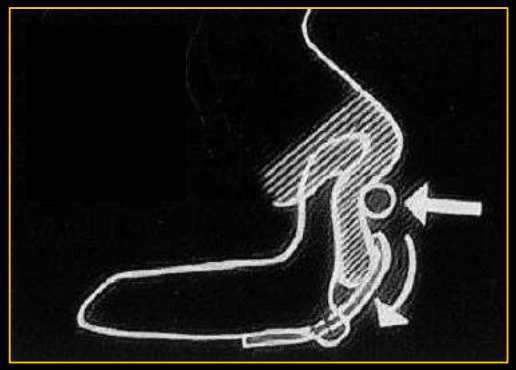
Before primary lip repair (NAM)

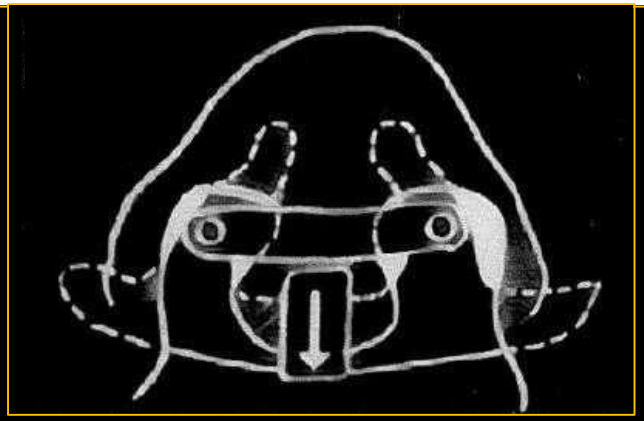
Presurgical Nasoalveolar Orthopedic Molding in Primary Correction of the Nose, Lip, and Alveolus of Infants Born With Unilateral and Bilateral Clefts

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

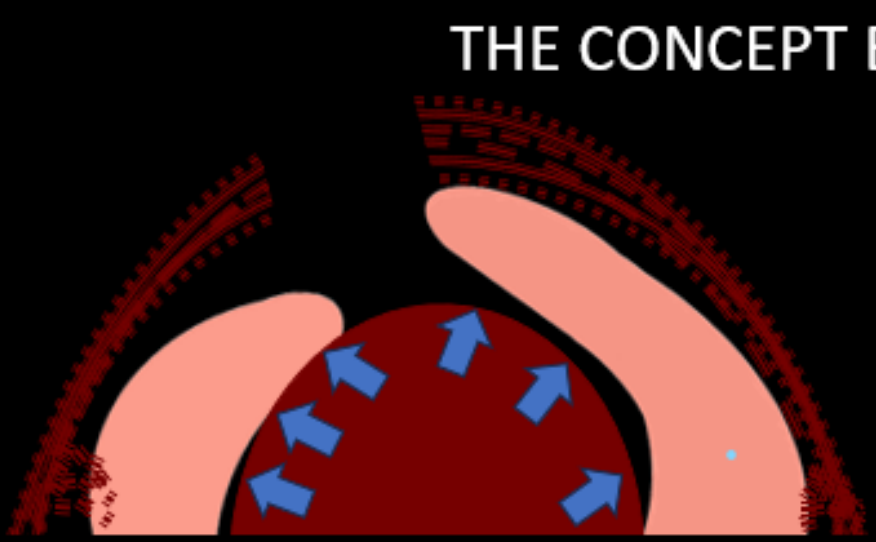
Dr. Barry H. Grayson, DDS[,], Dr. Court B. Cutting, M.D. *The Cleft Palate-Craniofacial Journal* Vol38, Issue 3, pp 193 – 198, May.2001

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.

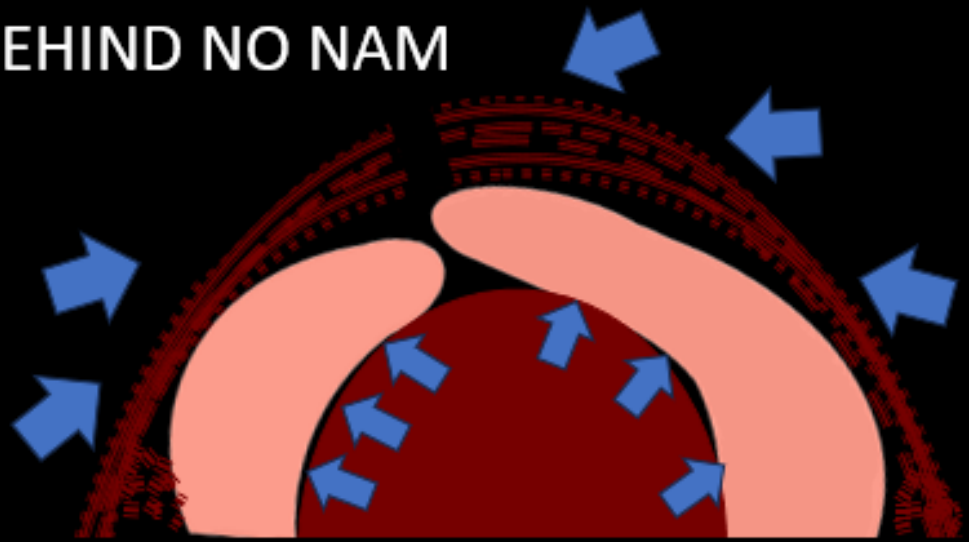
Since 2021, we have started using passive plate with nasal elevator. We changed our protocol to get a better nasal contour.

THE CONCEPT BEHIND NO NAM



Orbicularis Oris muscle fiber attached to buccinator muscle.

And buccinator muscle attached to the lateral side of alveolus.



Approximating of lip – Muscle repair (ala nasalis and orbicularis oris) + perialveoloplasty and septoplasty redirect the growing alveolar segment in ideal anatomical relation.

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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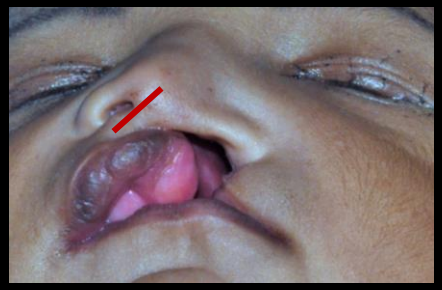
Presurgical Naso-alveolar Moulding

Pre NAM

Post NAM



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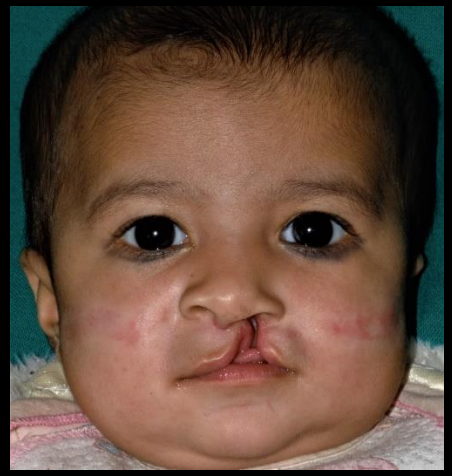
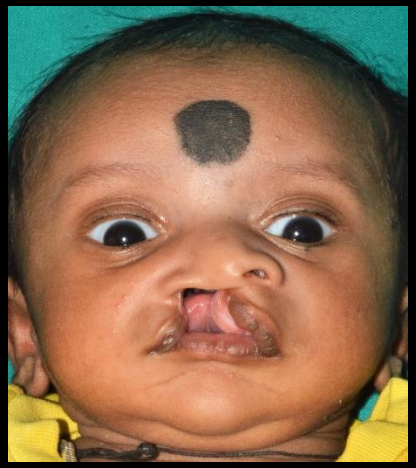
Pre NAM

Post NAM



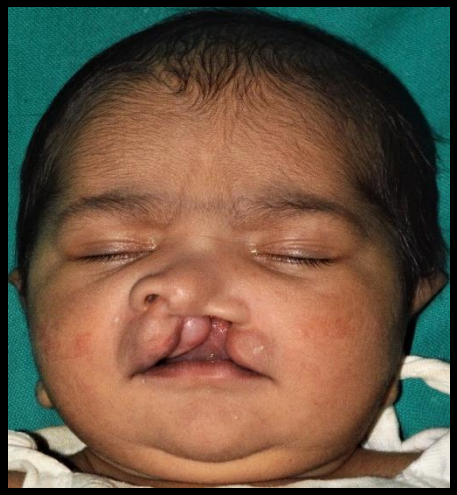
Pre NAM

Post NAM



Pre NAM

Post NAM



Pre NAM

Post NAM

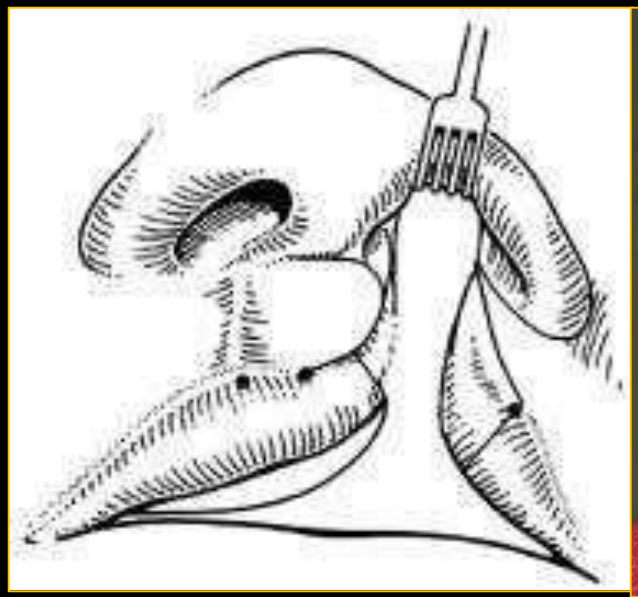
Goals of Morphofunctional Correction of Unilateral Cleft Lip Defects

A functional anatomical repair of the underlying hard and soft tissues is essential.

Goals of primary cleft lip repair

- Harmonious lip form in vertical and horizontal dimension
- Nasal symmetry
- Bridging the alveolar ridge

Millard's Incision for Unilateral Cleft Lip (1996-2000)

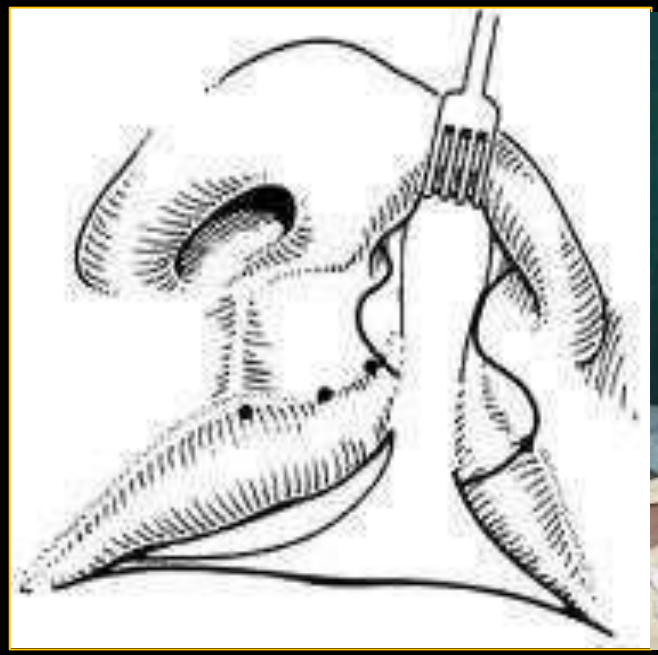


Produces better results where

- preoperatively there was a more prominent Cupid's bow and
- where the width of the lip and nostril on the cleft (lateral) side were greater than mean values

Source:
Choice of Incision for Primary Repair of Unilateral Complete Cleft Lip: A Comparative Studyof Outcomes in 796 Patients.
Gosla Srinivas Reddy et. al.; Plastic Reconstr. Surg.; 121: 932, 2008

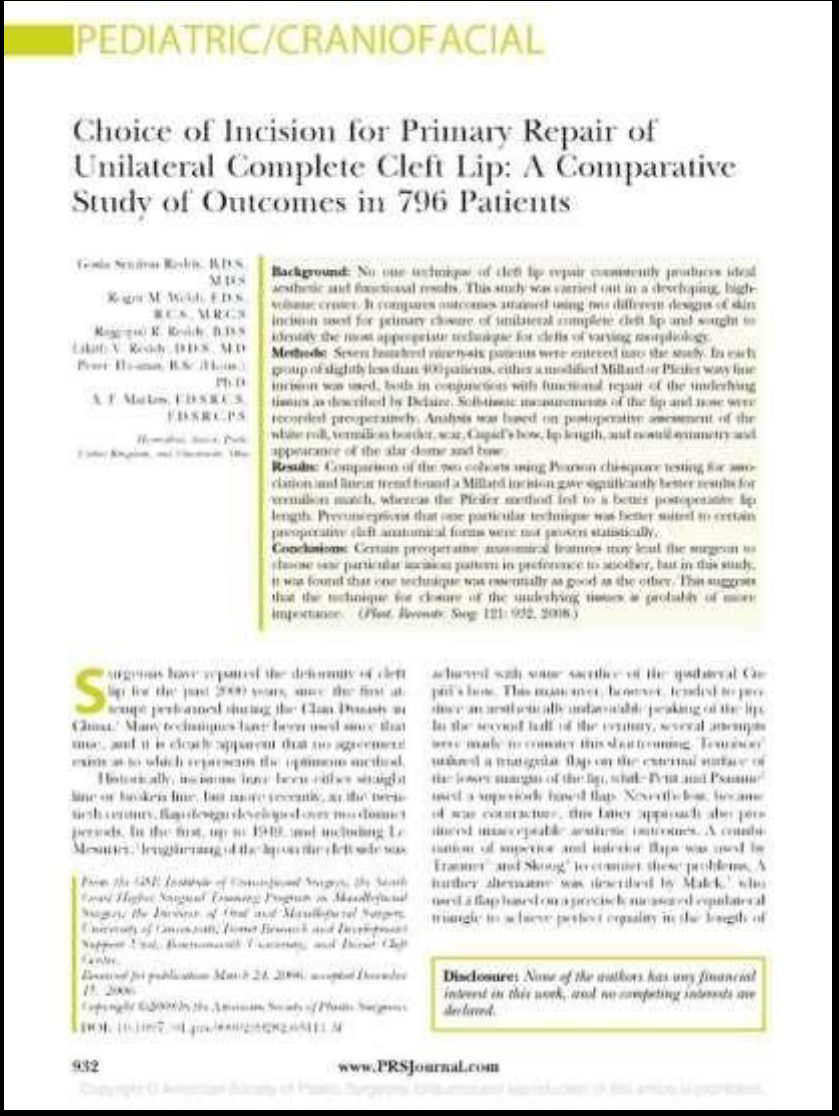
Pfeifer's Incision for Unilateral Cleft Lip (2000-2003)



Produces better results

- where the height of the lip on the cleft side was greater and
- where the columella height and width were greater than mean values

Source:
Choice of Incision for Primary Repair of Unilateral Complete Cleft Lip: A Comparative Studyof Outcomes in 796 Patients.
Gosla Srinivas Reddy et. al.; Plastic Reconstr. Surg.; 121: 932, 2008



PEDIATRIC/CRANIOFACIAL

Choice of Incision for Primary Repair of Unilateral Complete Cleft Lip: A Comparative Study of Outcomes in 796 Patients

Gosia Sitzman Rivkin, B.D.S., M.D.S.
Roger M. Welch, F.D.S., R.C.S., M.R.C.S.
Reggie H. Rivkin, B.D.S.
Lilah V. Rivkin, D.D.S., M.D.
Peter Hosman, B.Sc. (Hons.), Ph.D.
A. F. Markus, F.D.S.R.C.S., F.D.S.R.C.P.S.

Background: No one technique of cleft lip repair consistently produces ideal aesthetic and functional results. This study was carried out in a developing, high-volume center. It compares outcomes attained using two different designs of skin incision used for primary closure of unilateral complete cleft lip and sought to identify the most appropriate technique for clefts of varying morphology.
Methods: Seven hundred ninety-six patients were entered into the study. In each group of slightly less than 400 patients, either a modified Millard or Pfeifer wave-line incision was used, both in conjunction with functional repair of the underlying tissues as described by Delaire. Soft-tissue measurements of the lip and nose were recorded preoperatively. Analysis was based on postoperative assessment of the white roll, vermilion border, scar, Cupid's bow, lip length, and nostril symmetry and appearance of the alar dome and base.
Results: Comparison of the two cohorts using Pearson chi-square testing for association and linear trend found a Millard incision gave significantly better results for vermilion match, whereas the Pfeifer method led to a better postoperative lip length. Preconceptions that one particular technique was better suited to certain preoperative cleft anatomical forms were not proven statistically.
Conclusions: Certain preoperative anatomical features may lead the surgeon to choose one particular incision pattern in preference to another, but in this study, it was found that one technique was essentially as good as the other. This suggests that the technique for closure of the underlying tissues is probably of more importance. (*Plast. Reconstr. Surg.* 121: 932, 2008.)

Surgeons have repaired the deformity of cleft lip for the past 2000 years, since the first attempt performed during the Han Dynasty in China.[1] Many techniques have been used since that time, and it is clearly apparent that no agreement exists as to which represents the optimum method.

Historically, incisions have been either straight line or broken line, but more recently, as the twentieth century, flap design developed over two distinct periods. In the first, up to 1949, and including Le Mesurier's "lengthening of the lip on the cleft side was achieved with some sacrifice of the ipsilateral Cupid's bow. This manoeuvre, however, tended to produce an aesthetically unfavorable peaking of the lip. In the second half of the century, several attempts were made to counter this shortcoming. Tennison[2] utilized a triangular flap on the external surface of the lower margin of the lip, while Peer and Pfeanne[3] used a superiorly based flap. Nevertheless, because of scar contracture, this latter approach also produced unacceptable aesthetic outcomes. A combination of superior and inferior flaps was used by Trauner[4] and Skoog[5] to counter these problems. A further alternative was described by Malek,[6] who used a flap based on a precisely measured equilateral triangle to achieve perfect equality in the length of

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Disclosure: *None of the authors has any financial interest in this work, and no competing interests are declared.*

- The Millard flap produced better results when there was a need to rotate the cupids bow
- Pfeifer's design produced better results in the vertical elongation of the lip

It was found that one technique was essentially as good as the other.

Choice of Incision for Primary Repair of Unilateral Complete Cleft Lip: AComparative Study of Outcomes in 796 Patients.

Plastic and Reconstructive Surgery 121: 932, 2008

An incision utilizing the advantages of both Millard and Pfeifer incision

Afroze incision

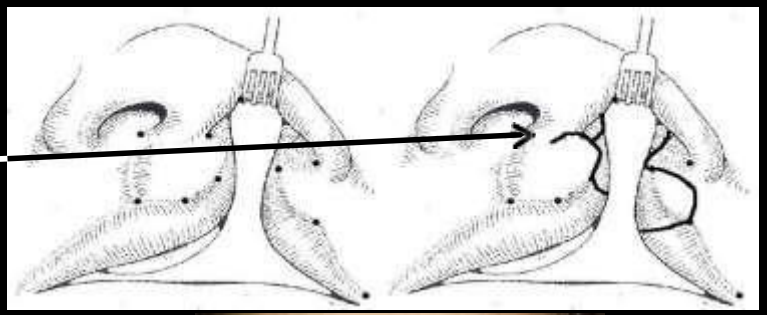
- Developed to address the problem of lip length discrepancy and vermillion matching using only one incision.
- Combined the Millard incision on the non-cleft side (medial side) and the Pfeifer incision on the cleft side (lateral side).
- Millard incision on the non-cleft side aids rotation and the Pfeifer incision on the cleft side aids lengthening trying to address horizontal and vertical discrepancies of the lip.

Source:
Afroze Incision for Functional Cheiloplasty, Technical Note
Gosla Srinivas Reddy et. al.; J. Craniofac. Surg. 20(8):1733-1736, September 2009.

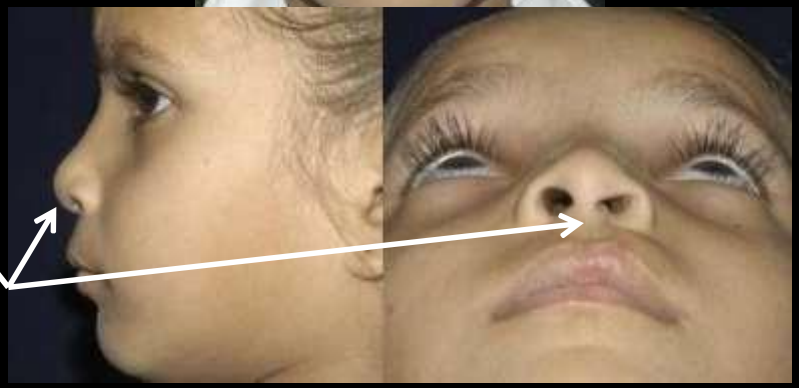
Afroze Incision

The Afroze incision does not cross onto the base of columella.

Incisions which cross the columella cause scarring leading to growth retardation and severe downward pull of the columella on affected side



The Afroze incision separates the medial part of ala on cleft side and its associated mal-aligned muscle to further lift the tip of the nose and improve the alar contour and reduce the webbing in the nose



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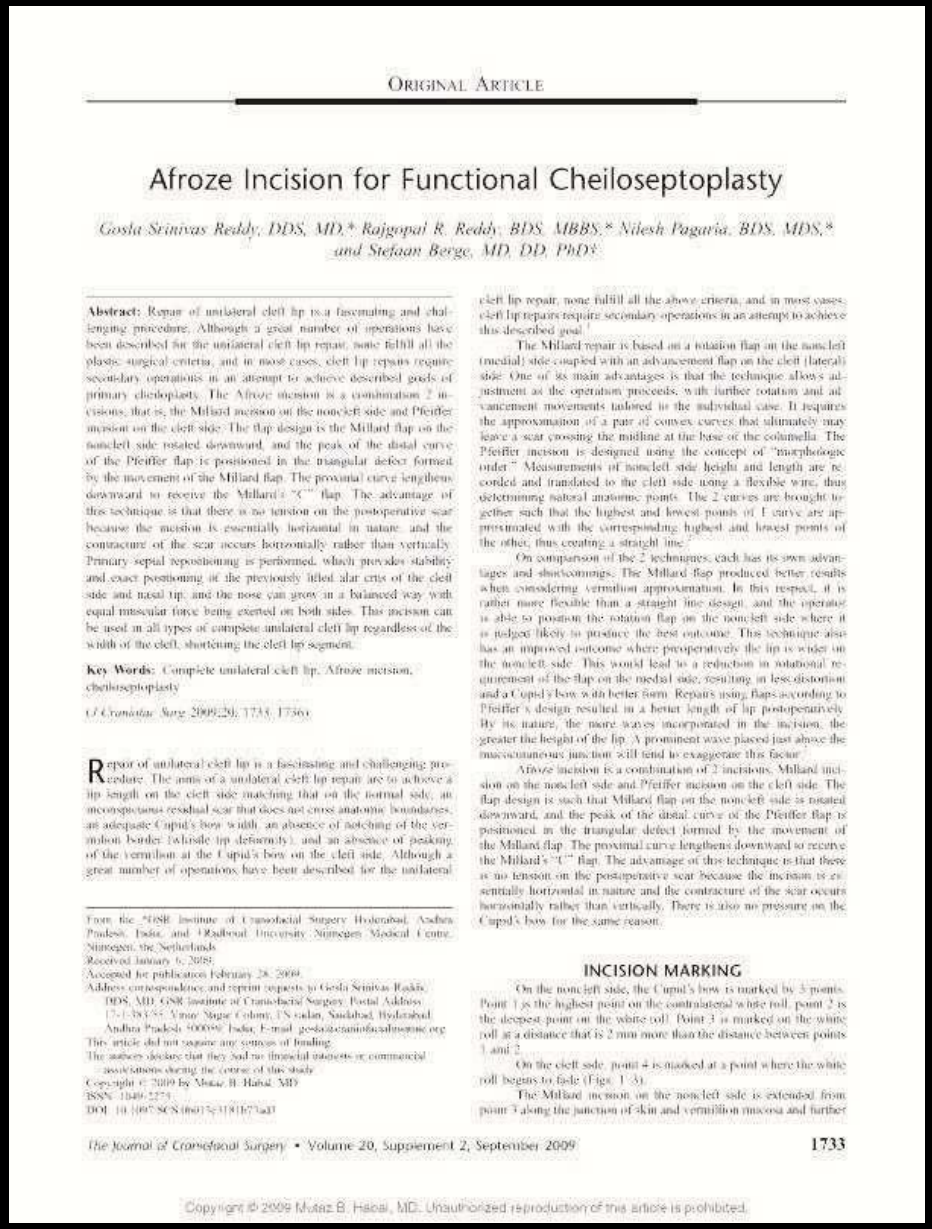

ORIGINAL ARTICLE

Afroze Incision for Functional Cheiloseptoplasty

Gosla Srinivas Reddy, DDS, MD, Rajgopal R. Reddy, BDS, MBBS,* Nilesh Pagaria, BDS, MDS,* and Stefaan Berge, MD, DD, PhD†*

Abstract: Repair of unilateral cleft lip is a fascinating and challenging procedure. Although a great number of operations have been described for the unilateral cleft lip repair, none fulfill all the plastic surgical criteria, and in most cases, cleft lip repairs require secondary operations in an attempt to achieve described goals of primary cheiloplasty. The Afroze incision is a combination 2 incisions, that is, the Millard incision on the noncleft side and Pfeiffer incision on the cleft side. The flap design is the Millard flap on the noncleft side rotated downward, and the peak of the distal curve of the Pfeiffer flap is positioned in the triangular defect formed by the movement of the Millard flap. The proximal curve lengthens downward to receive the Millard's "C" flap. The advantage of this technique is that there is no tension on the postoperative scar because the incision is essentially horizontal in nature and the contracture of the scar occurs horizontally rather than vertically. Primary septal repositioning is performed, which provides stability and exact positioning of the previously lifted alar crus of the cleft side and nasal tip, and the nose can grow in a balanced way with equal muscular force being exerted on both sides. This incision can be used in all types of complete unilateral cleft lip regardless of the width of the cleft, shortening the cleft lip segment.

Key Words: Complete unilateral cleft lip, Afroze incision, cheiloseptoplasty

J Craniofac Surg 2009;20: 1733–1736

Repair of unilateral cleft lip is a fascinating and challenging procedure. The aims of a unilateral cleft lip repair are to achieve a lip length on the cleft side matching that on the normal side, an inconspicuous residual scar that does not cross anatomic boundaries, an adequate Cupid's bow width, an absence of notching of the vermilion border (whistle lip deformity), and an absence of peaking of the vermilion at the Cupid's bow on the cleft side. Although a great number of operations have been described for the unilateral cleft lip repair, none fulfill all the above criteria, and in most cases, cleft lip repairs require secondary operations in an attempt to achieve this described goal.[1]

The Millard repair is based on a rotation flap on the noncleft (medial) side coupled with an advancement flap on the cleft (lateral) side. One of its main advantages is that the technique allows adjustment as the operation proceeds, with further rotation and advancement movements tailored to the individual case. It requires the approximation of a pair of convex curves that ultimately may leave a scar crossing the midline at the base of the columella. The Pfeiffer incision is designed using the concept of "morphologic order." Measurements of noncleft side height and length are recorded and translated to the cleft side using a flexible wire, thus determining natural anatomic points. The 2 curves are brought together such that the highest and lowest points of 1 curve are approximated with the corresponding highest and lowest points of the other, thus creating a straight line.[2]

On comparison of the 2 techniques, each has its own advantages and shortcomings. The Millard flap produced better results when considering vermilion approximation. In this respect, it is rather more flexible than a straight line design, and the operator is able to position the rotation flap on the noncleft side where it is judged likely to produce the best outcome. This technique also has an improved outcome where preoperatively the lip is wider on the noncleft side. This would lead to a reduction in rotational requirement of the flap on the medial side, resulting in less distortion and a Cupid's bow width better form. Repairs using flaps according to Pfeiffer's design resulted in a better length of lip postoperatively. By its nature, the more waves incorporated in the incision, the greater the height of the lip. A prominent wave placed just above the mucocutaneous junction will tend to exaggerate this factor.[3]

Afroze incision is a combination of 2 incisions, Millard incision on the noncleft side and Pfeiffer incision on the cleft side. The flap design is such that Millard flap on the noncleft side is rotated downward, and the peak of the distal curve of the Pfeiffer flap is positioned in the triangular defect formed by the movement of the Millard flap. The proximal curve lengthens downward to receive the Millard's "C" flap. The advantage of this technique is that there is no tension on the postoperative scar because the incision is essentially horizontal in nature and the contracture of the scar occurs horizontally rather than vertically. There is also no pressure on the Cupid's bow for the same reason.

INCISION MARKING

On the noncleft side, the Cupid's bow is marked by 3 points. Point 1 is the highest point on the contralateral white roll, point 2 is the deepest point on the white roll. Point 3 is marked on the white roll at a distance that is 2 mm more than the distance between points 1 and 2.

On the cleft side, point 4 is marked at a point where the white roll begins to fade (Figs. 1–3).

The Millard incision on the noncleft side is extended from point 3 along the junction of skin and vermilion mucosa and further

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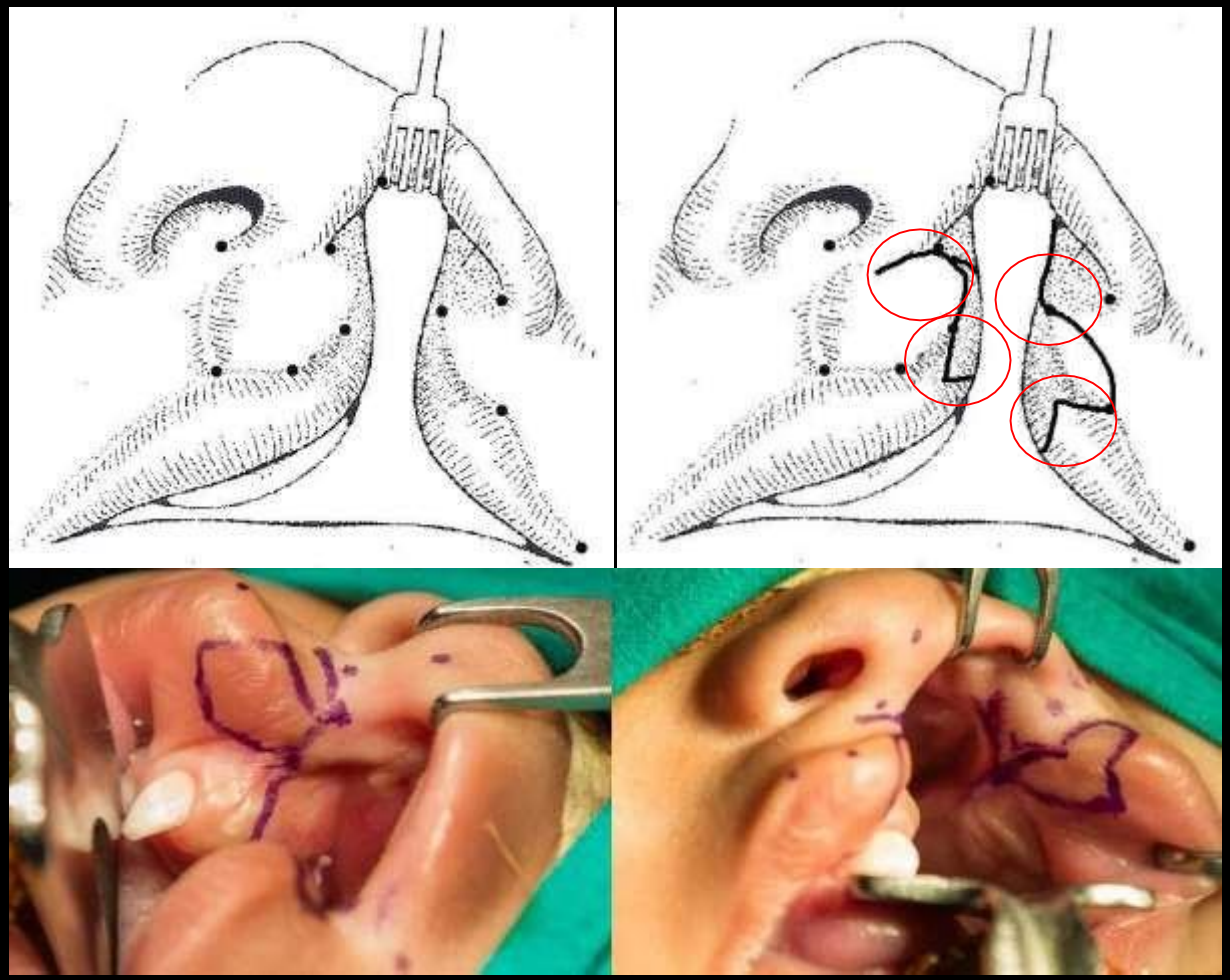
Srinivas Gosla Reddy et al.

Afroze Incision for Functional Cheiloplasty,

J. Craniofac. Surg. 20(8):1733-1736, September 2009.

Morpho-functional Cleft Lip Repair

Incision design for unilateral cleft lip surgery



Source:

Afroze Incision for Functional Cheiloplasty, Technical Note

Gosla Srinivas Reddy et. al.; J. Craniofac. Surg. 20(8):1733-1736, September 2009.

Morpho-functional Cleft Lip Repair

Minimal muscle dissection on cleft side ensuring dissection of OrbicularisOris and Alar head of Nasalis muscle

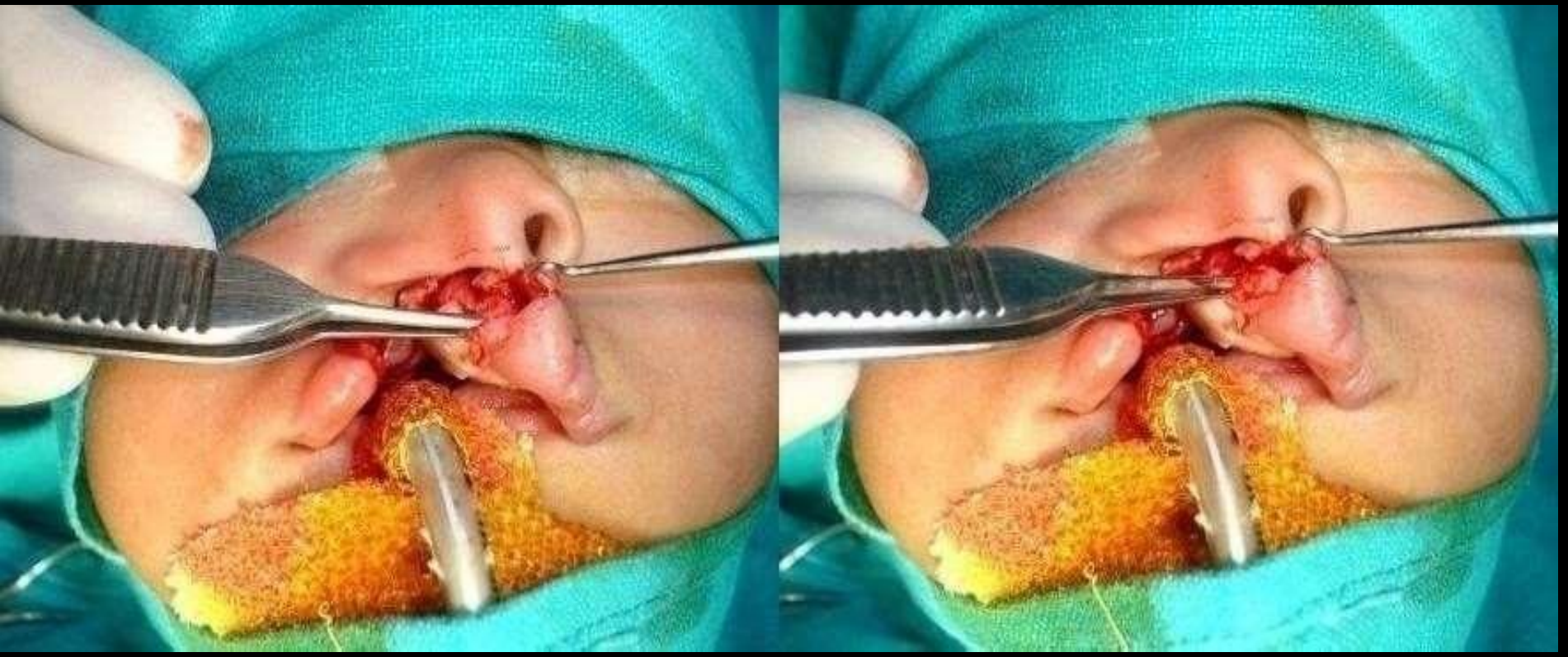
Source:
Afroze Incision for Functional Cheiloplasty, Technical Note
Gosla Srinivas Reddy et. al.; J. Craniofac. Surg. 20(8):1733-1736, September 2009.

Morpho-functional Cleft Lip Repair

Wide sub-periosteal dissection is done from the vestibule on the cleft side over the piriform rim, nasal bone, infraorbital and malar to lift the facial mask

Source:
Afroze Incision for Functional Cheiloplasty, Technical Note
Gosla Srinivas Reddy et. al.; J. Craniofac. Surg. 20(8):1733-1736, September 2009

Morpho-functional Cleft Lip Repair



Minimal muscle dissection is done on the non-cleft side relieving all abnormal attachments on anterior nasal spine and columella

Source:
Afroze Incision for Functional Cheiloplasty, Technical Note
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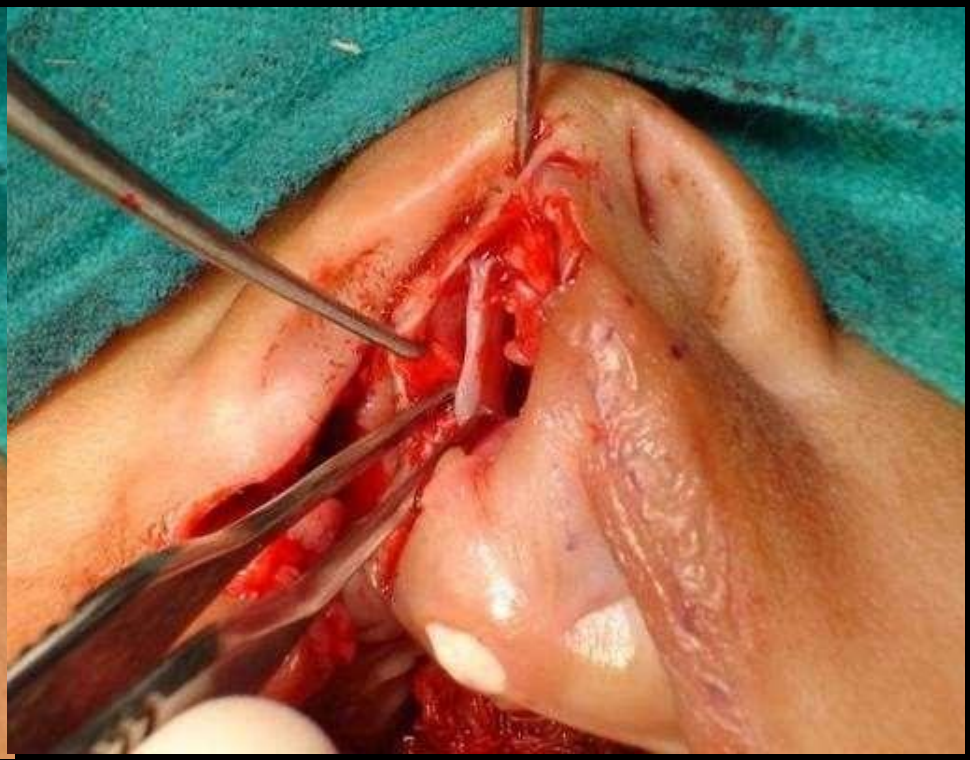
Morpho-functional Cleft Lip Repair



SEPTUM IS KEY

The septum is positioned in its rightful anatomical position

Source:
Afroze Incision for Functional Cheiloplasty, Technical Note
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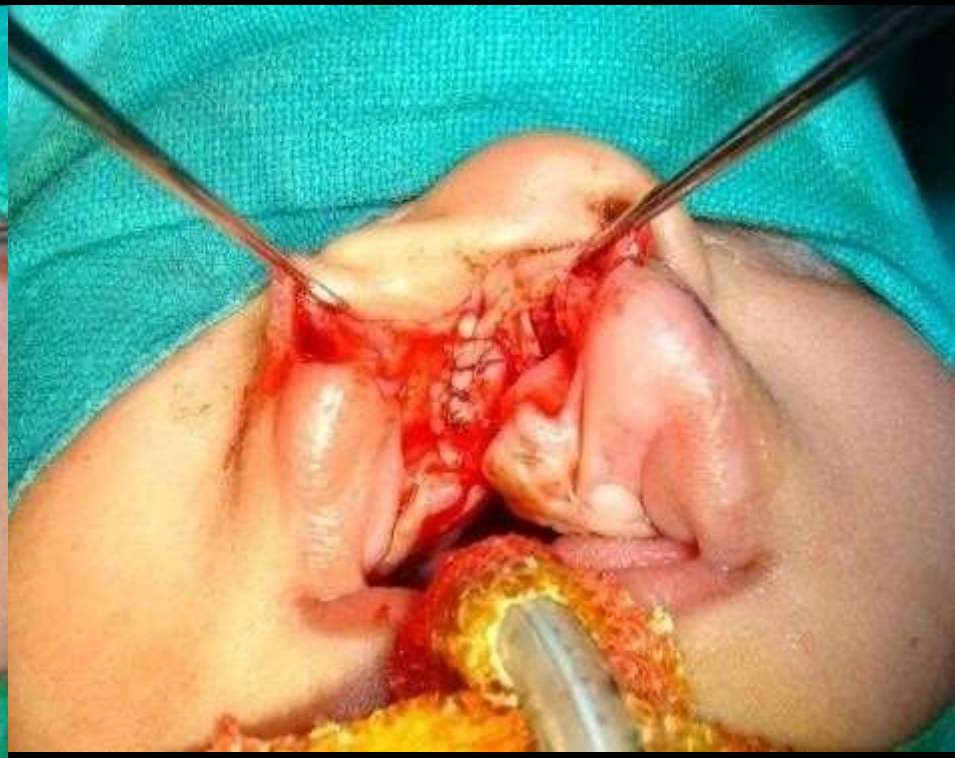
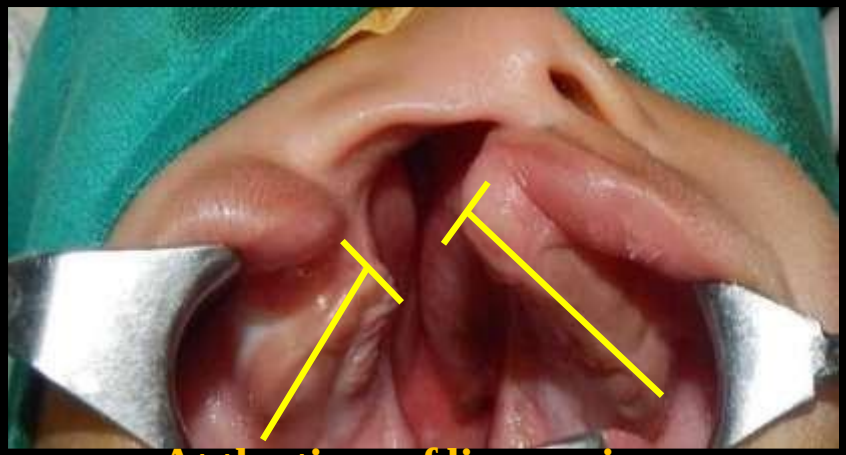
Morpho-functional Cleft Lip Repair



Perialveoloplasty is done to exert more medial pressure on the palatal shelves

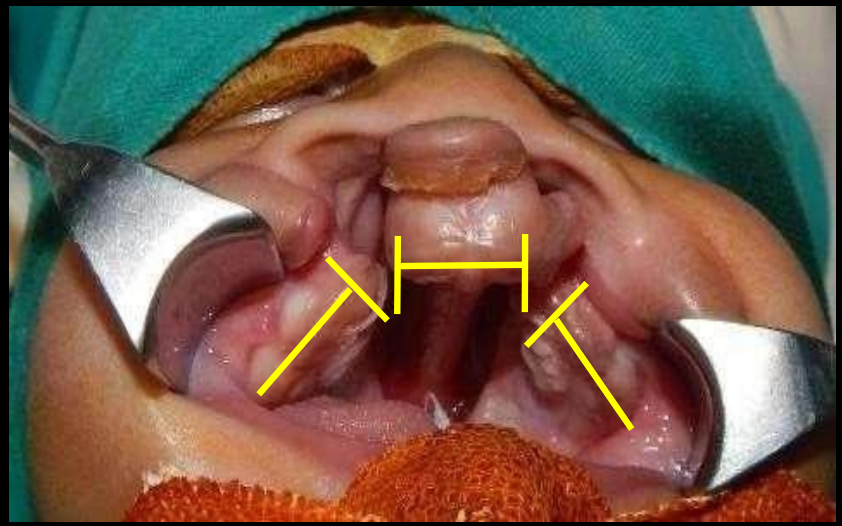
Source:
Afroze Incision for Functional Cheiloplasty, Technical Note
Gosla Srinivas Reddy et. al.; J. Craniofac. Surg. 20(8):1733-1736, September 2009.

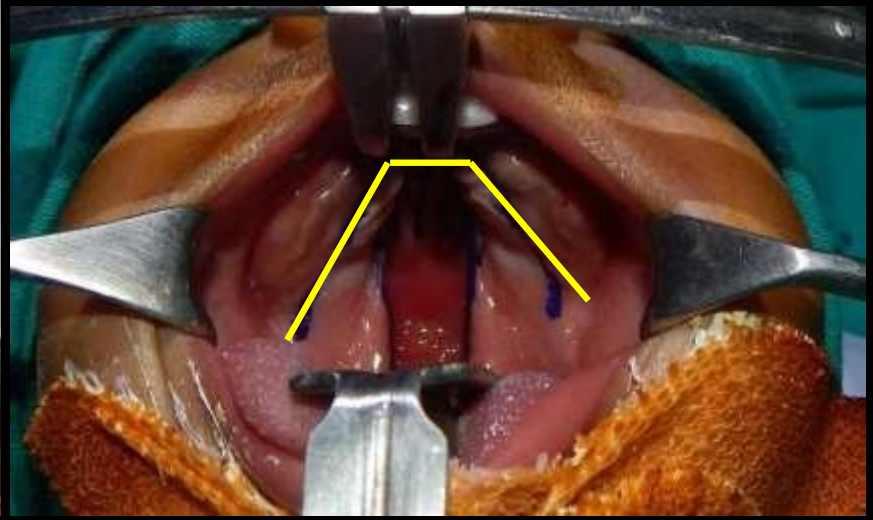
At the time of primary lip repair (Morphofunctional Cleft Lip Repair-Perialveoplasty)



At the time of lip repair

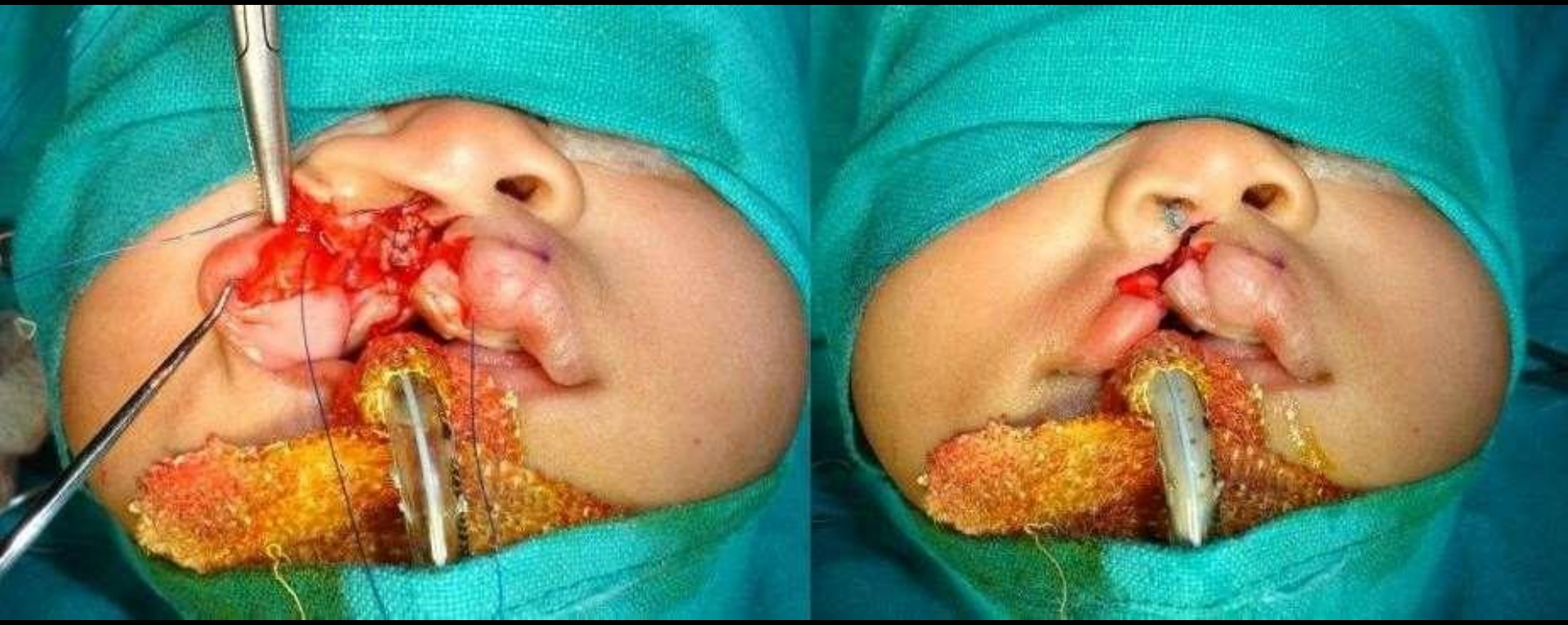
At the time of palate repair





Morpho-functional repair of complete unilateral cleft lip to achieve aesthetic balance between the lip and nose: an evidence based study Gosla-Reddy, S. et al.International Journal of Oral and Maxillofacial Surgery, Volume 44 , e13 - e14, 2015.

Morpho-functional Cleft Lip Repair



Ala of nose stabilized symmetrically to match that of the normal side by taking a suture through the alar head of the nasalis muscle on the cleft side to the contralateral muscle through the septum

Source:
Afroze Incision for Functional Cheiloplasty, Technical Note
Gosla Srinivas Reddy et. al.; J. Craniofac. Surg. 20(8):1733-1736, September 2009.

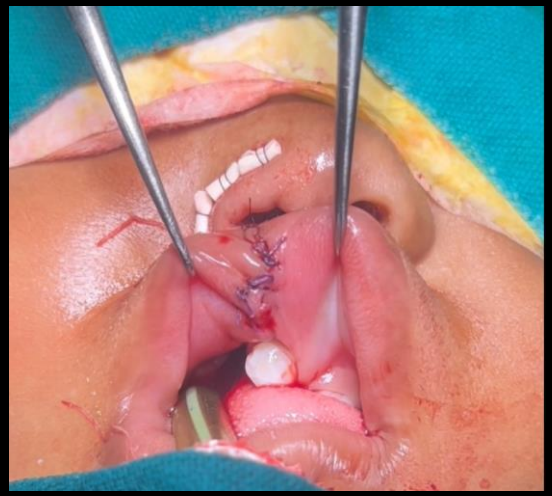
Morpho-functional Cleft Lip Repair

OrbicularisOris muscle approximation and closure is done

Source:
Afroze Incision for Functional Cheiloplasty, Technical Note
Gosla Srinivas Reddy et. al.; J. Craniofac. Surg. 20(8):1733-1736, September 2009.

EVOLUTION OF OUR TECHNIQUE

PROCEDURE	DRAWBACKS	CHANGES INCORPORATED
Primary cheiloplasty	Difference in the alar base height	Alar suspension suture using needle
Patients treated with NAM device		Gingivoperiosteoplasty



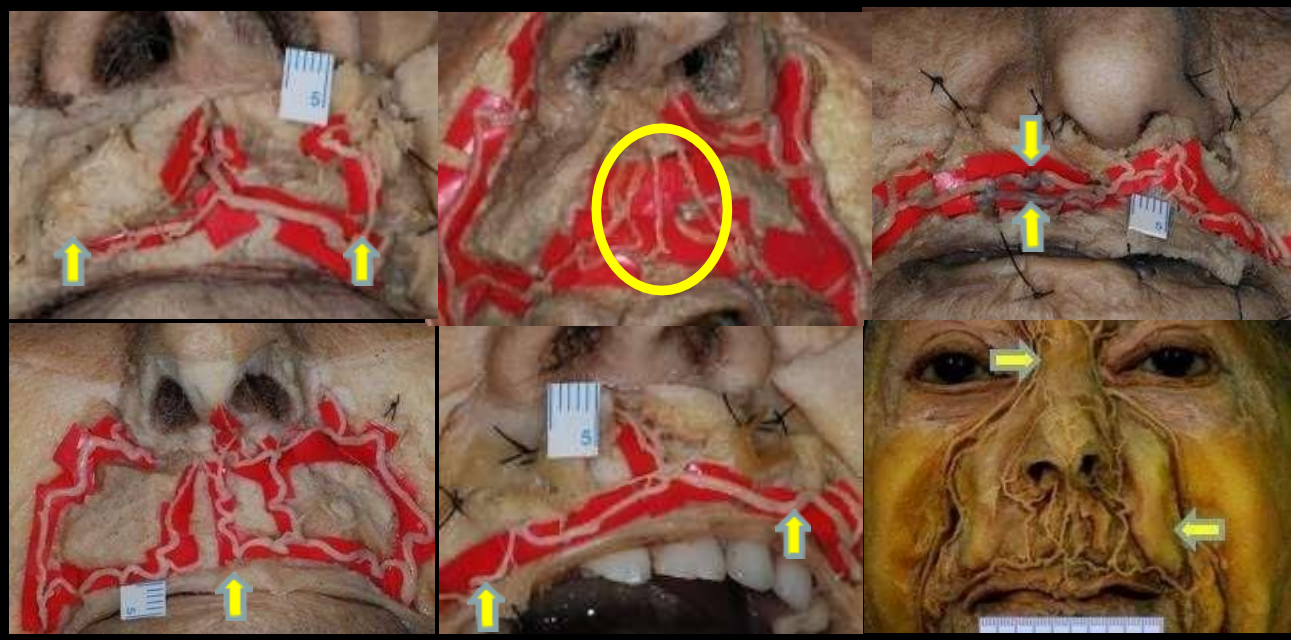
Gingivo-Peri-Osteoplasty Ala-Nasalis Repositioning - Alar Suspension

Does this incision design protect the vascularity of the lip?

What we have identified in naso-labial vasculature in cadaver dissection

Morphological and functional variability

- Superior LabialArtery Caliber asymmetry
- Superior Labial Artery Anastomosis Inconsistent
- Superior LabialArtery Duplications
- PhiltralArtery Redundancy Medially
- PhiltralArtery Asymmetry Laterally
- FacialisArtery Asymmetry



Measurments of S_vO_2, rHb, flow, (O_2-metab.) in 2 anatomical planes:

Tissue spectroscopy

Laser doppler flowmetry

0.4 mm →skin

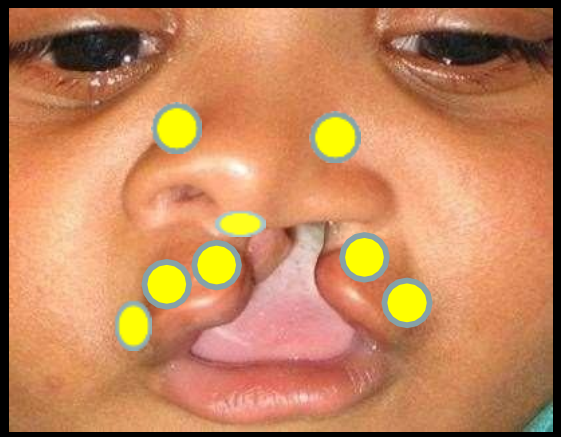
4 mm →muscle

8 surgical landmarks

22 normal

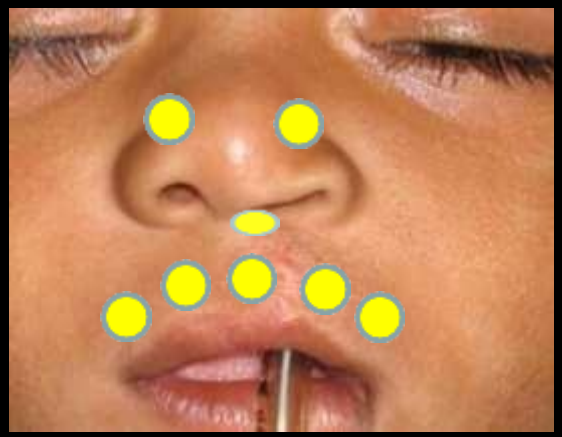
mean age 62m (SD 43)

33 unilat. Cleft preop



mean age 9m (SD 6)

29 unilat. cleft Late postop



mean age 23m (SD 48)
time postop 27.5m (SD 33.6m)

Intraoperative Vascular Anatomy, Arterial Blood Flow Velocity, and Microcirculation in Unilateral and Bilateral Cleft Lip Repair

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Dieter Schumann, M.D., D.M.D.
Rajgopal R. Reddy, M.B.B.S., B.D.S.
Katja Schwenzer-Zimmerer, M.D., D.M.D.
Magdalena Mueller-Gerbl, M.D.
Hans-Florian Zeilhofer, M.D., D.M.D.
Hermann F. Sailer, M.D., D.M.D.
Srinivas Gosla Reddy, M.D., M.B.B.S., Ph.D.

Basel and Zurich, Switzerland; and Hyderabad, India

Background: Cleft lip repair aims to normalize the disturbed anatomy and function. The authors determined whether normalization of blood circulation is achieved.
Methods: The authors measured the microcirculatory flow, oxygen saturation, and hemoglobin level in the lip and nose of controls ($n = 22$) and in patients with unilateral and bilateral cleft lip–cleft palate. The authors measured these parameters before lip repair ($n = 29$ and $n = 11$, respectively), at the end of lip repair ($n = 27$ and 10, respectively), and in the late postoperative period ($n = 33$ and $n = 20$, respectively). The arterial flow velocity was measured in unilateral groups at the same time points ($n = 18$, $n = 11$, and $n = 12$, respectively). Statistical differences were determined using analysis of variance.
Results: Before surgery, the arterial flow velocities and microcirculation values were similar on each side of the face and between groups. The microcirculatory flow was significantly higher in the prolabium of bilateral patients than in the philtrum of controls. All circulation values in unilateral and bilateral patients in the late postoperative period were within the range of controls and of those before surgery. Intraoperatively, the authors consistently found a perforating artery on the superficial side of the transverse nasalis muscle.
Conclusions: There appears to be no intrinsic circulatory deficit in unilateral and bilateral cleft lip–cleft palate patients. The increased flow in the prolabium indicates a strong hemodynamic need in this territory, compelling its vascular preservation. Whether surgical preservation of the nasalis perforator artery is of long-term benefit should be addressed in future studies. (*Plast. Reconstr. Surg.* 130: 1120, 2012.)
CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, V.

Cleft lip repair techniques differ mainly in the design of the skin incisions, how the muscle portions are reconstructed, and how the nasal framework is repositioned.[1] The vascular anatomy has remained largely unaddressed in current surgical techniques, and the reasons for this have yet to be explored.

Normal blood supply is a precondition for development and growth. Thus, it would be of clinical interest to determine whether cleft anatomy leads to a change in the blood supply before or after surgery.

Current techniques for cleft lip repair exclude surgical anastomosis of the lip artery. However, this clinical approach is not based on blood circulation data and so the current standard must be challenged. Vascular damage in cleft surgery interrupts the existent hemodynamics and necessitates further trauma to stop the bleeding, after which the blood circulation may take several months to recover.[2] Gentle surgical soft-tissue han-

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Received for publication January 17, 2012; accepted May 23, 2012.
Presented in part at the 20th Congress of the European Association for Craniomaxillofacial Surgery, in Bruges, Belgium, September 14 through 17, 2010; the Sixth International Bernd-Spiessl-Symposium for Innovative and Visionary Technologies in Craniomaxillofacial Surgery, in Basel, Switzerland, June 17 through 19, 2010; and the 9th European Craniofacial Congress, in Salzburg, Austria, September 14 through 17, 2011.

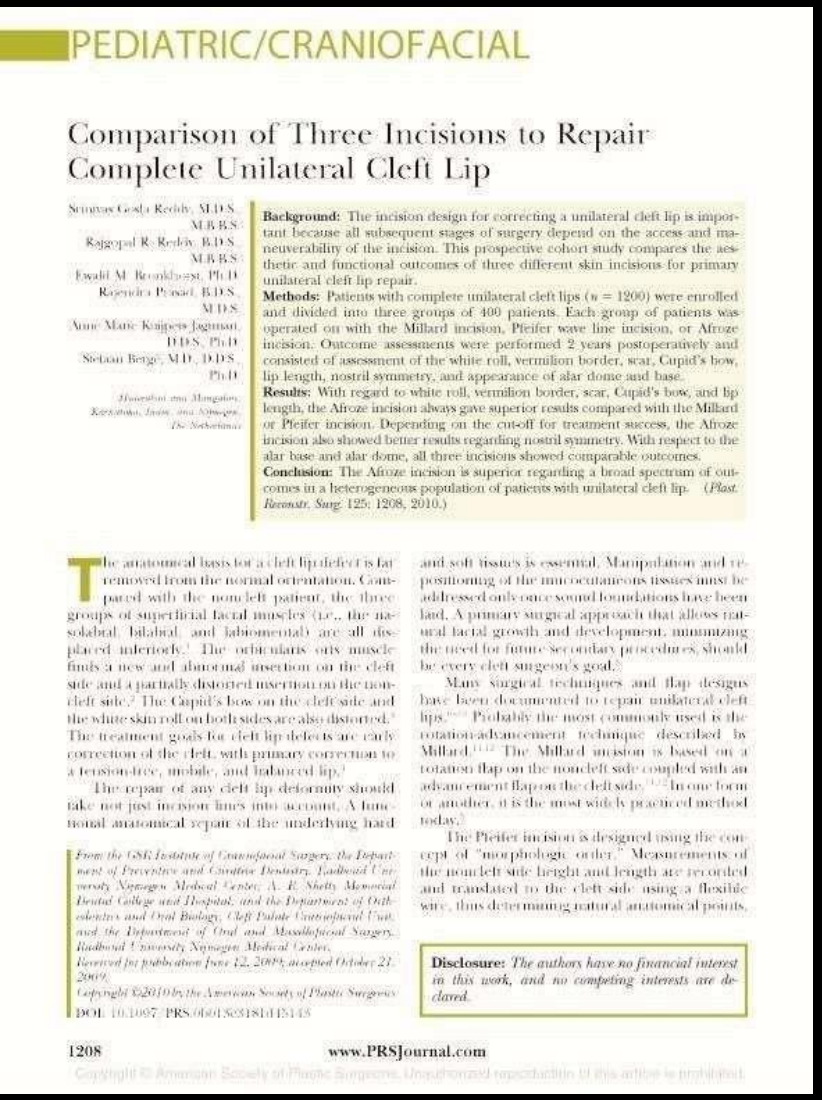
DOI: 10.1097/PRS.0b013e318267d4fb

Disclosure: *None of the authors has any conflicts of interest to declare.*

Vascular adaption
normal microcirculation late postoperative in cleft lips.

Columella shows a flow oversupply,
which is maintained late postoperative.

Intraoperative Vascular Anatomy,Arterial Blood Flow Velocityand Microcirculation in Unilateraland Bilateral Cleft Lip Repair
Plastic and Reconstructive Surgery 130 (5): 1120-1129,2013



PEDIATRIC/CRANIOFACIAL

Comparison of Three Incisions to Repair Complete Unilateral Cleft Lip

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Ewald M. Bronkhorst, Ph.D.
Rajendra Prasad, B.D.S., M.D.S.
Anne Marie Kuijpers-Jagtman, D.D.S., Ph.D.
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Hyderabad and Mangalore, Karnataka, India; and Nijmegen, The Netherlands

Background: The incision design for correcting a unilateral cleft lip is important because all subsequent stages of surgery depend on the access and maneuverability of the incision. This prospective cohort study compares the aesthetic and functional outcomes of three different skin incisions for primary unilateral cleft lip repair.

Methods: Patients with complete unilateral cleft lips ($n = 1200$) were enrolled and divided into three groups of 400 patients. Each group of patients was operated on with the Millard incision, Pfeifer wave line incision, or Afroze incision. Outcome assessments were performed 2 years postoperatively and consisted of assessment of the white roll, vermilion border, scar, Cupid's bow, lip length, nostril symmetry, and appearance of alar dome and base.

Results: With regard to white roll, vermilion border, scar, Cupid's bow, and lip length, the Afroze incision always gave superior results compared with the Millard or Pfeifer incision. Depending on the cut-off for treatment success, the Afroze incision also showed better results regarding nostril symmetry. With respect to the alar base and alar dome, all three incisions showed comparable outcomes.

Conclusion: The Afroze incision is superior regarding a broad spectrum of outcomes in a heterogeneous population of patients with unilateral cleft lip. (*Plast. Reconstr. Surg.* 125: 1208, 2010.)

The anatomical basis for a cleft lip defect is far removed from the normal orientation. Compared with the noncleft patient, the three groups of superficial facial muscles (i.e., the nasolabial, bilabial, and labiomental) are all displaced inferiorly.[1] The orbicularis oris muscle finds a new and abnormal insertion on the cleft side and a partially distorted insertion on the noncleft side.[2] The Cupid's bow on the cleft side and the white skin roll on both sides are also distorted.[3] The treatment goals for cleft lip defects are early correction of the cleft, with primary correction to a tension-free, mobile, and balanced lip.[4]

The repair of any cleft lip deformity should take not just incision lines into account. A functional anatomical repair of the underlying hard and soft tissues is essential. Manipulation and repositioning of the mucocutaneous tissues must be addressed only once sound foundations have been laid. A primary surgical approach that allows natural facial growth and development, minimizing the need for future secondary procedures, should be every cleft surgeon's goal.[5]

Many surgical techniques and flap designs have been documented to repair unilateral cleft lips.[6–11] Probably the most commonly used is the rotation-advancement technique described by Millard.[12–14] The Millard incision is based on a rotation flap on the noncleft side coupled with an advancement flap on the cleft side.[12–14] In one form or another, it is the most widely practiced method today.[5]

The Pfeifer incision is designed using the concept of "morphologic order." Measurements of the noncleft side height and length are recorded and translated to the cleft side using a flexible wire, thus determining natural anatomical points.

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DOI: 10.1097/PRS.0b013e3181d15145

Disclosure: *The authors have no financial interest in this work, and no competing interests are declared.*

- Afroze incision performed better
  - Cupids bow position
  - Lip length
  - Lip height
- Millard Incision performed
  - Scar position

What about the nose?

Comparison of Three Incisions to Repair Complete Unilateral Cleft Lip. Plastic and Reconstructive Surgery, 125 (4): 1208-1216, 2010.

Is Primary Septoplasty necessary???

No negative sequelae can be observed after manipulation of the septum in children.

(Smahel, Z. 1999)

Growth of the nose is favorable after primary rhinoplasty.

(McComb, H 1996)

Complete Unilateral Cleft Lip

Without Simonart's band (Type I a)

With Simonart's band (Type I b)

Without complete collapse of nasal dome and ala (Type II a)

With completecollapse of nasal dome and ala (Type II b)

Complete Unilateral Cleft Lip

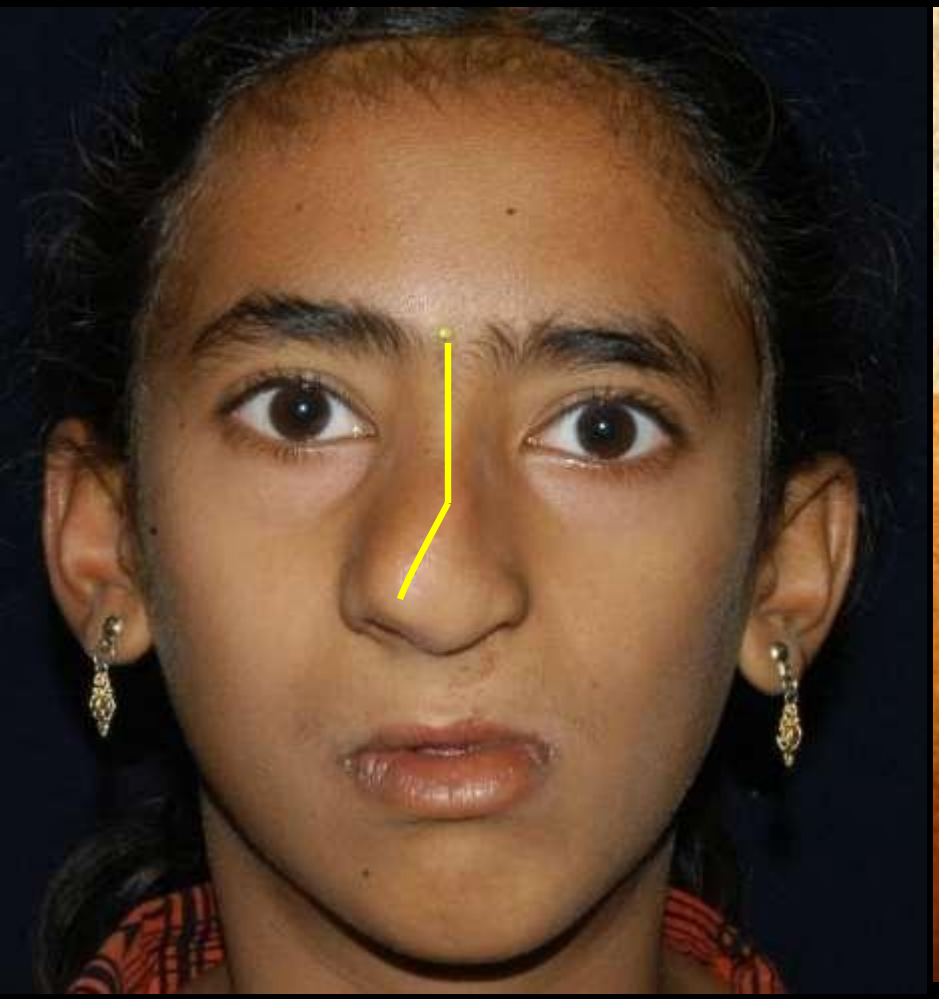
Without difference in level of alveolar ridges (Type III a)

With difference in level of alveolar ridges (Type III b)

COMMON FACTOR INALL UNILATERAL COMPLETECLEFT LIPS

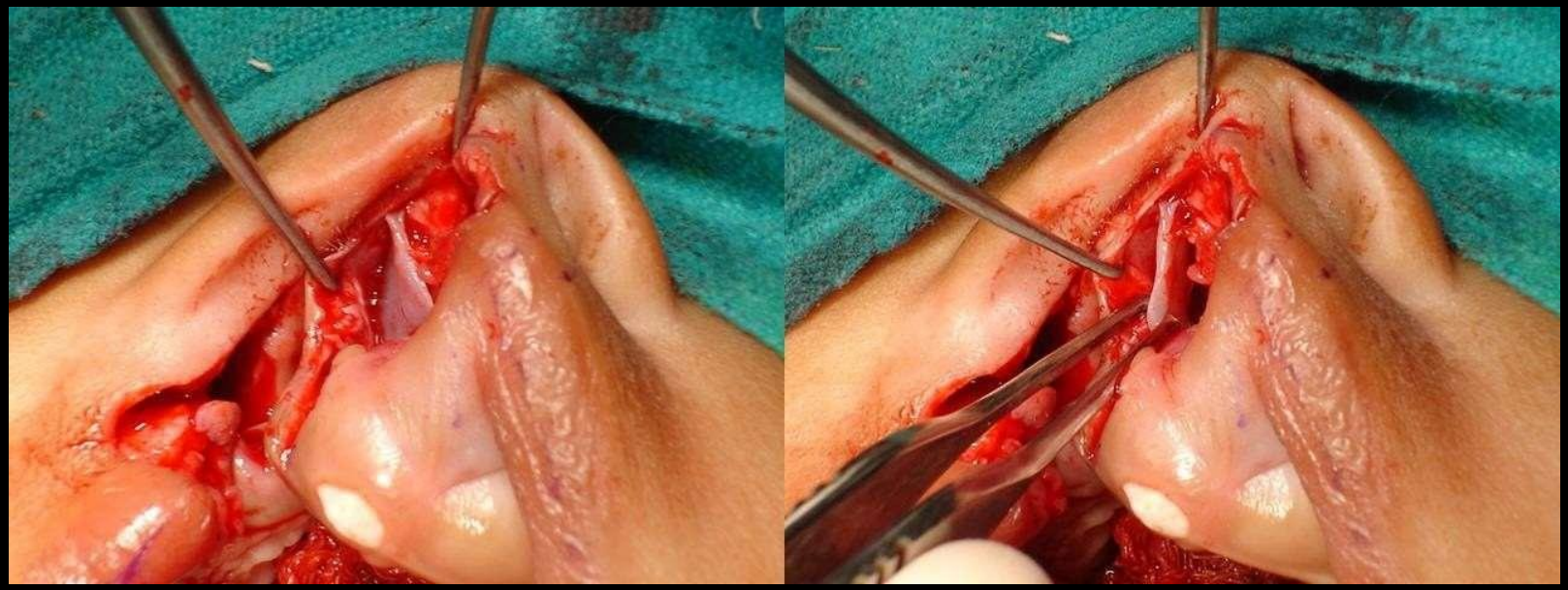
DEVIATED NASALSEPTUM

Is Primary Septoplasty necessary???



Afifteen year old patient with no primary septoplasty

SEPTOCHEILOPLASTY: Unilateral Cleft Lip



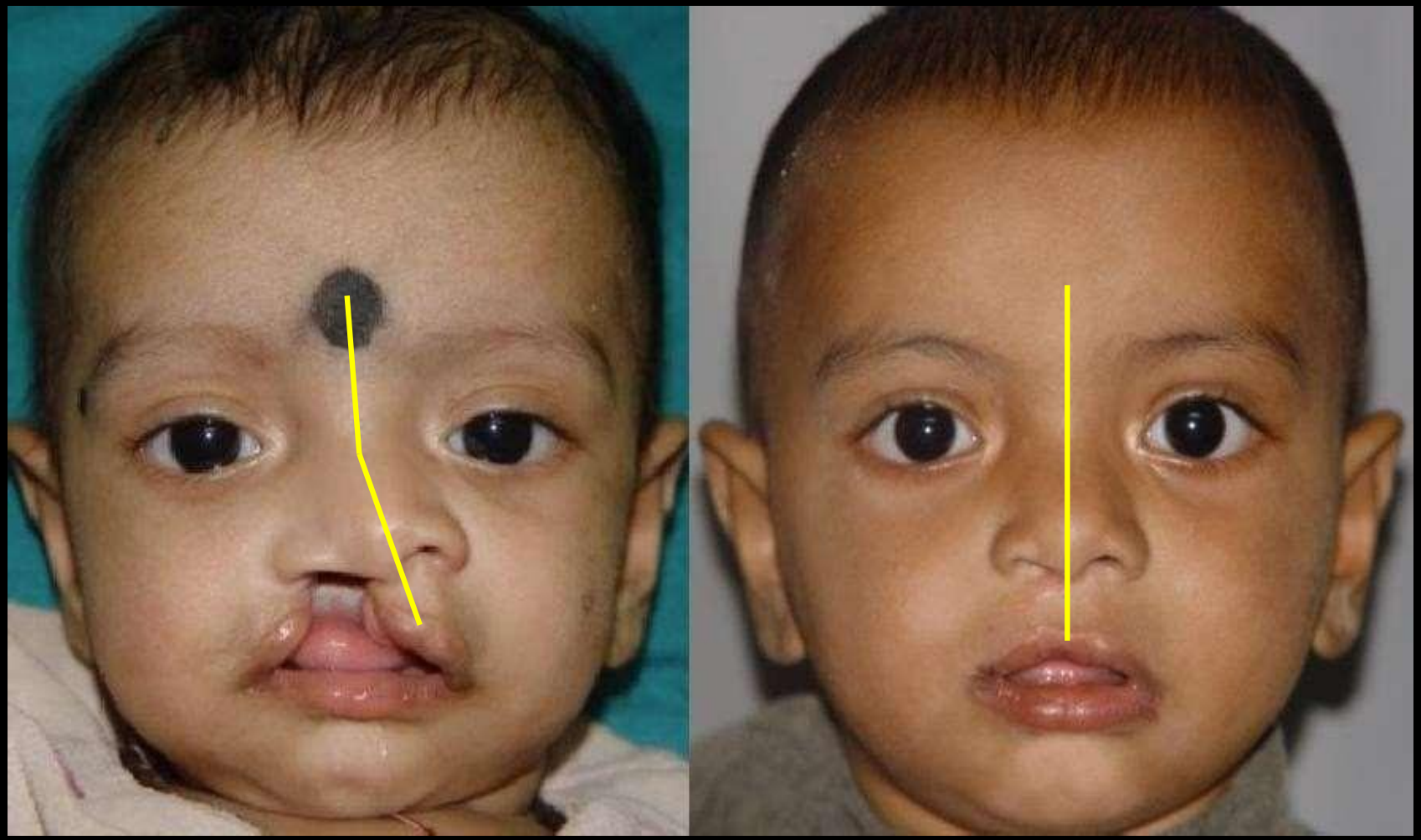
- Perichondrium is reflected on both sides of theseptum
- The septum is lifted off the nasal spine
- The septum is positioned in its anatomical center
- Perichondrium is closed
- Nasalis muscle from both sides are approximated to form a sling with the septum in the new central position

Source:

Afroze Incision for Functional Cheiloplasty, Technical Note

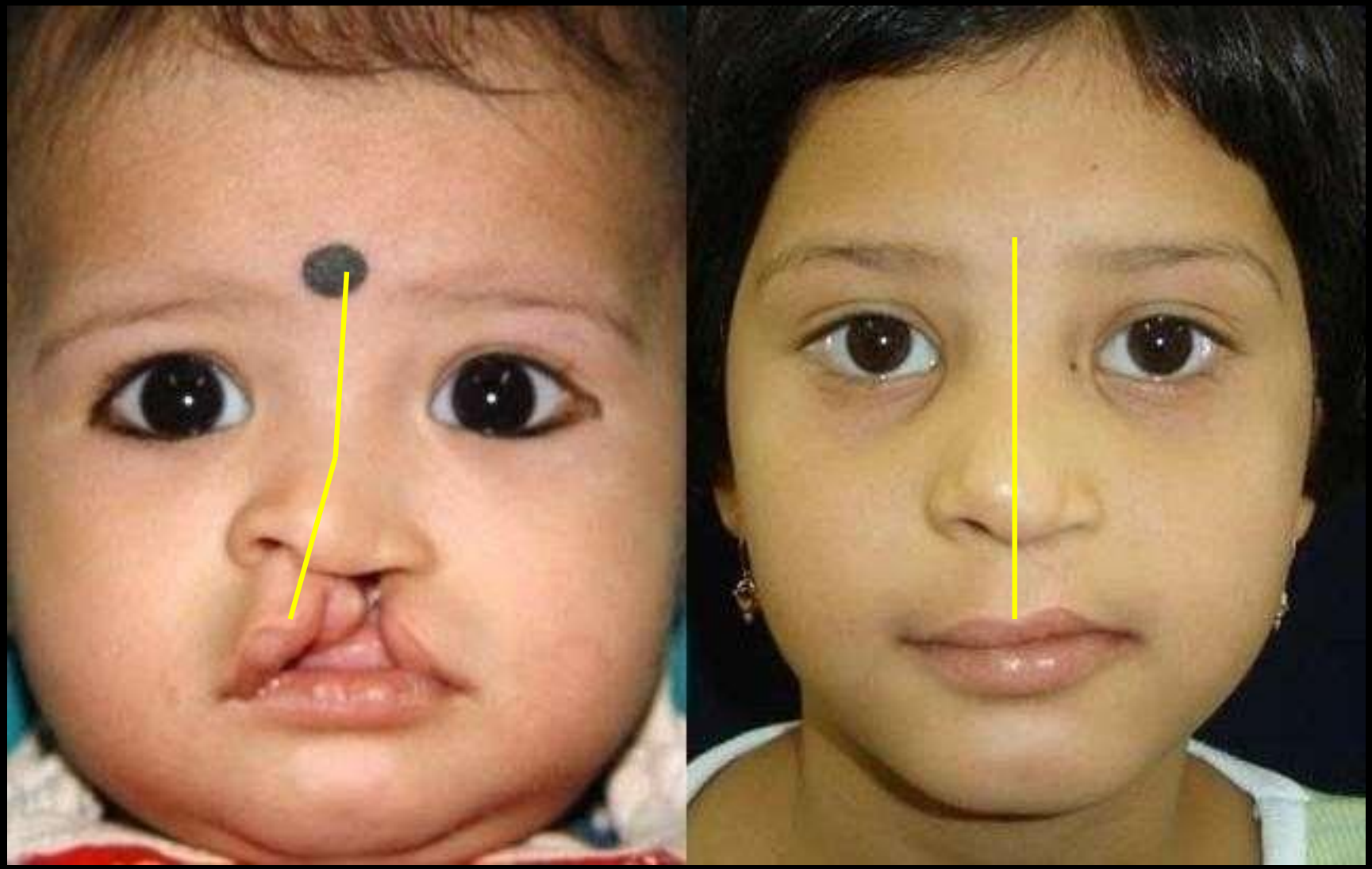
Gosla Srinivas Reddy et. al.; J. Craniofac. Surg. 20(8):1733-1736, September 2009.

Septocheiloplasty: 1 year post operatively

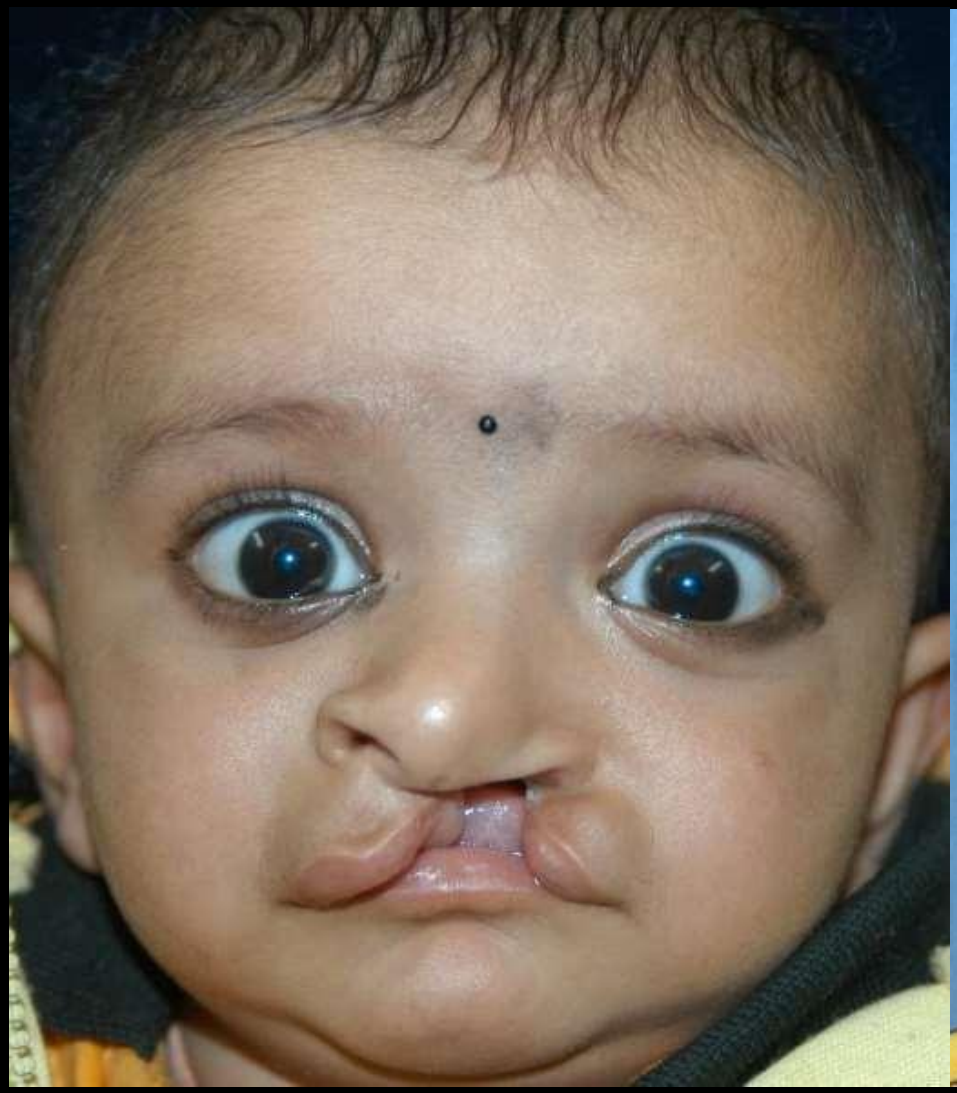


Septocheiloplasty: 3 years post operatively

Septocheiloplasty: 8 years post operatively

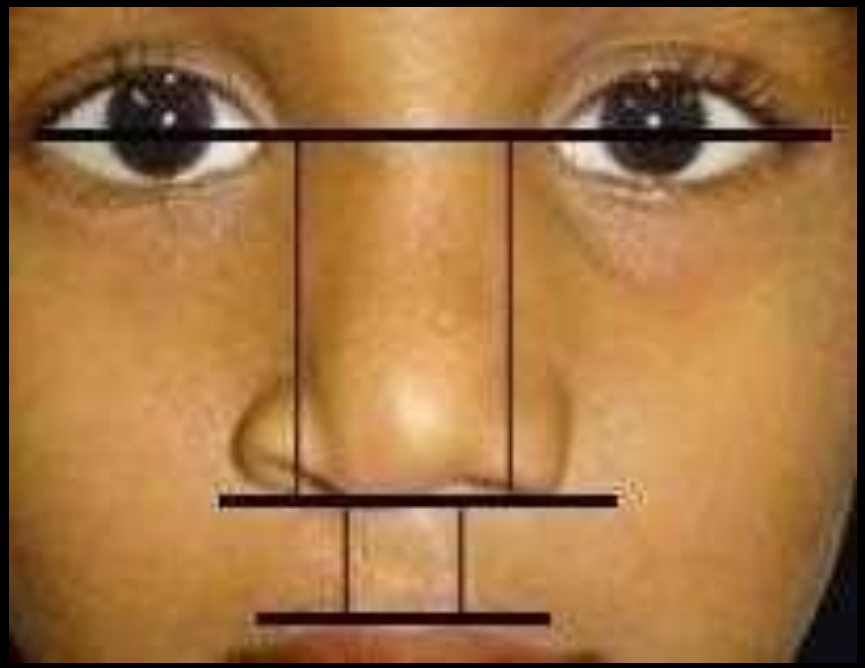


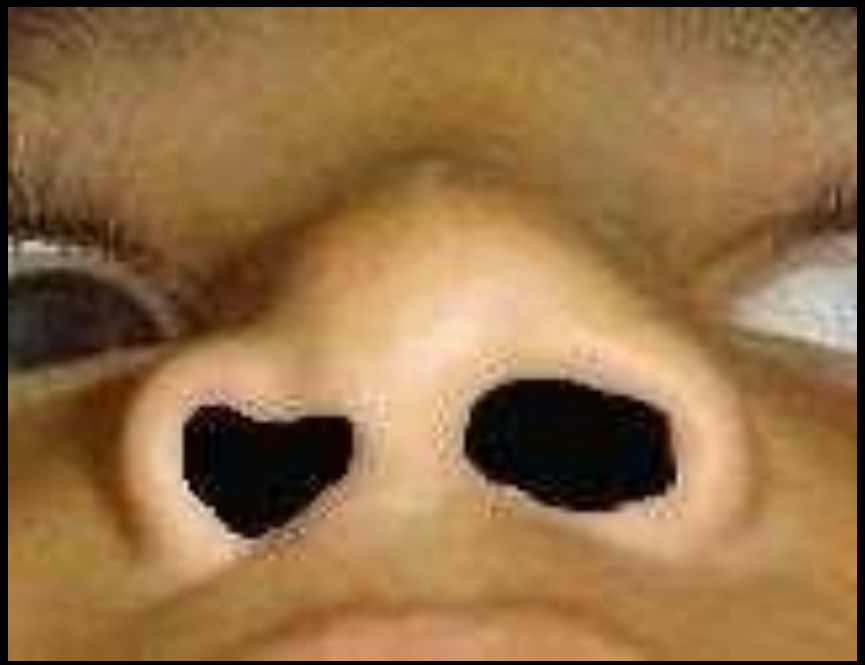
Septocheiloplasty: 15 years post operatively



2 Dimensional Photographic Analysis

Septocheiloplasty: Measuring Outcomes 2 Dimensional Photographic Analysis

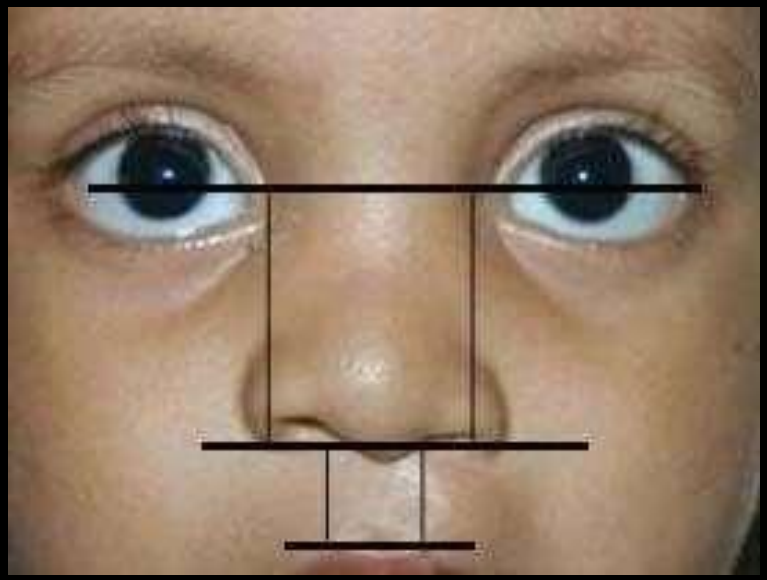




Primary Cheiloplasty without Septoplasty Note the septal deviation and alar droop

Source:
Gosla Reddy S, et al. Primary Septoplasty in the Repair of Unilateral Complete Cleft Lip and Palate. Plastic and Reconstructive Surgery, 127 (2): 761-767, 2011

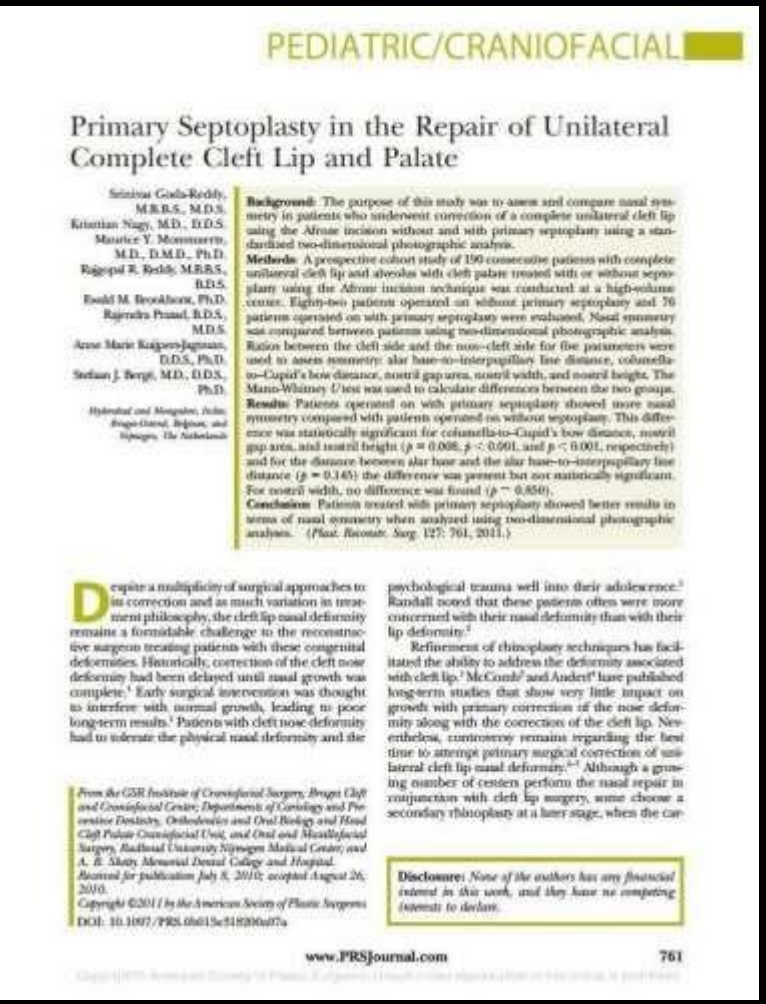
Septocheiloplasty: Measuring Outcomes
2 Dimensional Photographic Analysis



Primary Cheiloplasty with Septoplasty

Note the absence of septal deviation and reduced alar droop

Source:
Gosla Reddy S, et al. Primary Septoplasty in the Repair of Unilateral Complete Cleft Lip and Palate. Plastic and Reconstructive Surgery, 127 (2): 761-767, 2011



PEDIATRIC/CRANIOFACIAL

Primary Septoplasty in the Repair of Unilateral Complete Cleft Lip and Palate

Srinivas Gosla-Reddy, M.B.B.S., M.D.S.
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Rajagopal R. Reddy, M.B.B.S., B.D.S.
Roohi M. Brookhorst, Ph.D.
Rajendra Prasad, B.D.S., M.D.S.
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Stefaan J. Bergé, M.D., D.D.S., Ph.D.

Hyderabad and Mangalore, India; Bruges-Central, Belgium; and Nijmegen, The Netherlands

Background: The purpose of this study was to assess and compare nasal symmetry in patients who underwent correction of a complete unilateral cleft lip using the Afrose incision without and with primary septoplasty using a standardized two-dimensional photographic analysis.

Methods: A prospective cohort study of 190 consecutive patients with complete unilateral cleft lip and alveolus with cleft palate treated with or without septoplasty using the Afrose incision technique was conducted at a high-volume center. Eighty-two patients operated on without primary septoplasty and 70 patients operated on with primary septoplasty were evaluated. Nasal symmetry was compared between patients using two-dimensional photographic analysis. Ratios between the cleft side and the non–cleft side for five parameters were used to assess symmetry: alar base–to–interpupillary line distance, columella-to–Cupid's bow distance, nostril gap area, nostril width, and nostril height. The Mann-Whitney *U* test was used to calculate differences between the two groups.

Results: Patients operated on with primary septoplasty showed more nasal symmetry compared with patients operated on without septoplasty. This difference was statistically significant for columella-to–Cupid's bow distance, nostril gap area, and nostril height ($p = 0.008$, $p < 0.001$, and $p < 0.001$, respectively) and for the distance between alar base and the alar base–to–interpupillary line distance ($p = 0.145$); the difference was present but not statistically significant. For nostril width, no difference was found ($p = 0.850$).

Conclusion: Patients treated with primary septoplasty showed better results in terms of nasal symmetry when analyzed using two-dimensional photographic analysis. (*Plast. Reconstr. Surg.* 127: 761, 2011.)

Despite a multiplicity of surgical approaches to its correction and as much variation in treatment philosophy, the cleft lip nasal deformity remains a formidable challenge to the reconstructive surgeon treating patients with these congenital deformities. Historically, correction of the cleft nose deformity had been delayed until nasal growth was complete.[1] Early surgical intervention was thought to interfere with normal growth, leading to poor long-term results.[2] Patients with cleft nose deformity had to tolerate the physical nasal deformity and the psychological trauma well into their adolescence.[3] Randall noted that these patients often were more concerned with their nasal deformity than with their lip deformity.[3]

Refinement of chinoplasty techniques has facilitated the ability to address the deformity associated with cleft lip.[4] McComb[5] and Anderl[6] have published long-term studies that show very little impact on growth with primary correction of the nose deformity along with the correction of the cleft lip. Nevertheless, controversy remains regarding the best time to attempt primary surgical correction of unilateral cleft lip nasal deformity.[4–7] Although a growing number of centers perform the nasal repair in conjunction with cleft lip surgery, some choose a secondary rhinoplasty at a later stage, when the car-

From the GSR Institute of Craniofacial Surgery, Bruges Cleft and Craniofacial Center; Departments of Cariology and Preventive Dentistry, Orthodontics and Oral Biology and Head Cleft Palate Craniofacial Unit, and Oral and Maxillofacial Surgery, Radboud University Nijmegen Medical Center; and A. B. Shetty Memorial Dental College and Hospital.
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DOI: 10.1097/PRS.0b013e318200ad7a

Disclosure: *None of the authors has any financial interest in this work, and they have no competing interests to declare.*

Primary septoplasty showed better results in terms of nasal symmetry when analyzed using two-dimensional photographic analyses.

Primary Septoplastyin the Repair of Unilateral Complete Cleft Lip and Palate. Plastic and Reconstructive Surgery, 127 (2): 761-767, 2011

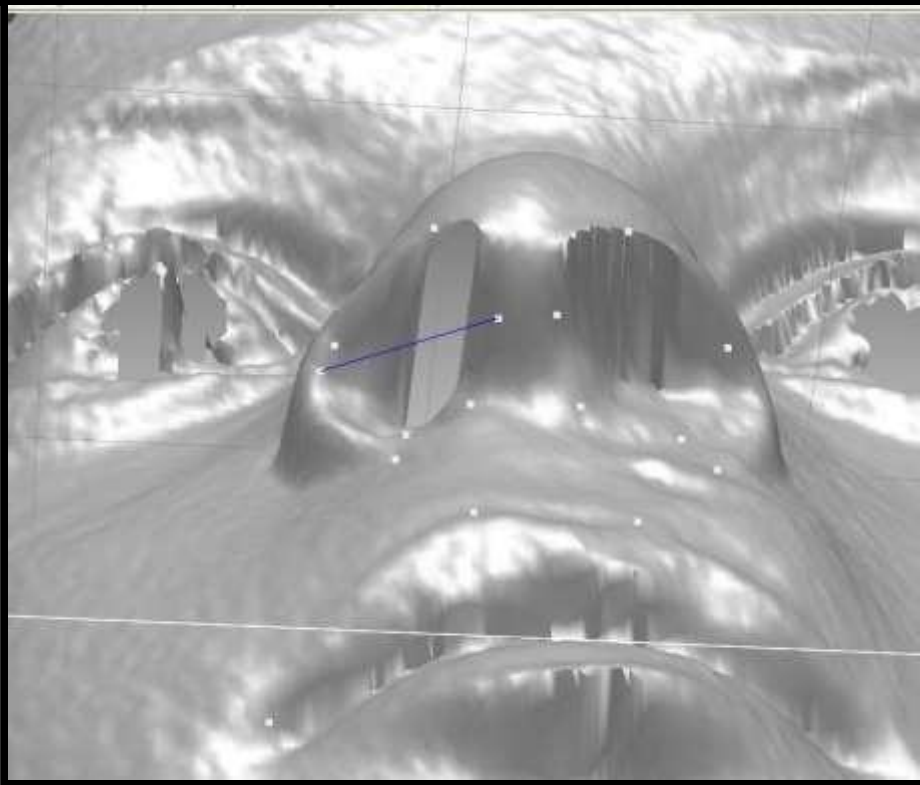
3 Dimensional Photographic Analysis

3 Dimensional Photographic Equipment

3 Dimensional LASER Equipment

Measurement: Right Nostril (Transversal)

Right Nostril Transversal: 12.1 mm



Right Nostril Transversal: 12.9 mm

3D Stereophotogrammetric analysis supported by Radboud University, Nijmegen (Prof. Stefaan Berge) and University Medical Center, Basel (Prof. Hans Florian Zeilhofer)

Landmarks & Measurements
3 D Photographs and LASER Images

Results

3 Dimensional Nasal Analysis of Patients with Complete Unilateral Cleft Lip corrected with Septocheiloplasty

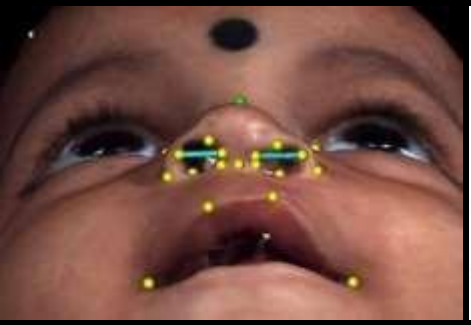
Volumetric analysis of the nose

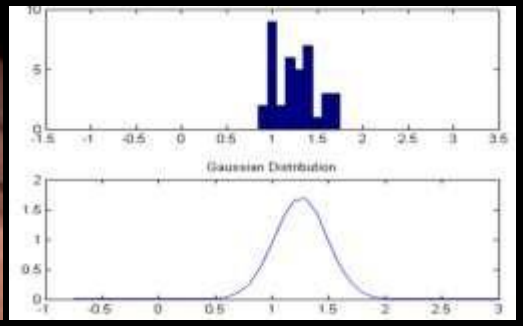
Source:
Gosla Reddy et.al. 3D Stereo photo grammetric analysis of lip and nasal symmetry after primary cheiloseptoplasty in primary cleft lip repair.
Rhinology, 49: 546-553, 2011

Results

3 Dimensional Nasal Analysis of Patients with Complete Unilateral Cleft Lip corrected with Septocheiloplasty

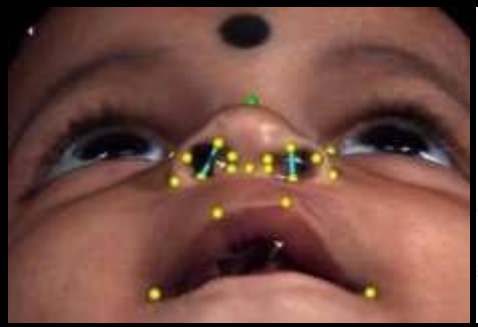
Transverse/Horizontal Nostril Length

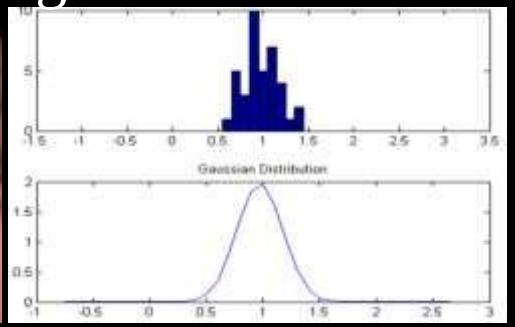




Mean Symmetry ratio of 1.25

Vertical Nostril Length





Mean Symmetry ratio of 0.97

Source:

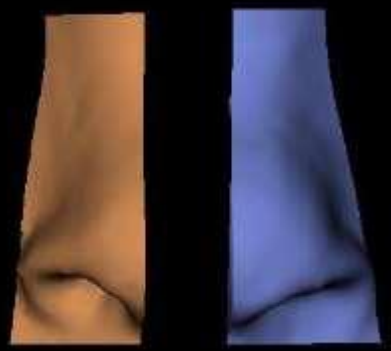
3 Dimensional Analysis of Patients with Complete Unilateral Cleft Lip corrected with Septocheiloplasty.

Gosla Reddy S, Mommaerts MY,Reddy R, Chaitidis D, Mueller A, Schwenzer K, Berge S: Ongoing Study, Radboud University, Netherlands and University of Basel, Switzerland

Results

3 Dimensional Nasal Analysis of Patients with Complete Unilateral Cleft Lip corrected with Septocheiloplasty

Volumetric analysis of the nose



Ratio Left Volume vs. Right Volume = 1.09

Source:
Gosla Reddy et.al. 3D Stereophotogrammetric analysis of lip and nasal symmetry after primary cheiloseptoplasty in primary cleft lip repair.
Rhinology, 49: 546-553, 2011

ORIGINAL CONTRIBUTION

Rhinology 49: 546-553, 2011

3D stereophotogrammetric analysis of lip and nasal symmetry after primary cheiloseptoplasty in complete unilateral cleft lip repair*

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SUMMARY

***Background**: The aim of this study was to evaluate symmetry of the lip and nose in patients with CUCLP after primary cheiloseptoplasty (Afroze technique), in comparison to non-cleft controls.*

***Methodology**: In this prospective study, forty-four patients with operated non-syndromic CUCLP were included. The control group consisted of 44 volunteers without cleft defects of approximately the same age and sex. Primary septoplasty was performed in conjunction with the cleft lip (CL) repair using the Afroze incision. 3D facial images were acquired using 3D stereophotogrammetry. After a 3D cephalometric analysis of the lip and nose was performed in both groups, linear and volumetric data were acquired. Lip and nose symmetry were calculated and compared using Student's t-tests as well as the Chi square test.*

***Results**: For all measurements, the control group was up to 36% closer to perfect symmetry compared to the CUCLP group after primary surgery. This difference was statistically significant.*

***Conclusions**: After primary cheiloseptoplasty according to the Afroze technique in patients with CUCLP, asymmetry in the nose and lip area still exists as compared to non-cleft controls. Although non-cleft individuals also show some degree of asymmetry, the results of this study stress the difficulty in obtaining near normal symmetrical relations.*

Key words: cleft palate, three-dimensional imaging, maxillofacial surgery, nose, rhinoplasty, 3D stereophotogrammetry, volume.

INTRODUCTION

The ultimate goal for repair of the complete unilateral cleft lip, alveolus and palate (CUCLP) deformity is to create normal oronasal form and function. This aim has resulted in a plethora of techniques and innovations to optimize the esthetic and functional results. However, the management of CUCLP deformities, especially that of the nose, remains a challenge.

Various studies [1-8] have been undertaken to evaluate the results of different operative procedures to correct the CUCLP nose deformity. However, quantification of rhinoplastic procedures remains difficult. Besides direct anthropometric measurements [9], studies comparing pre- and postoperative nose and lip changes in patients with clefts are limited to two dimension-

Footnote: #Both authors contributed equally to the study

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Primary septoplasty showed better results in terms of nasal symmetry when analyzed using three-dimensional photographic analyses.

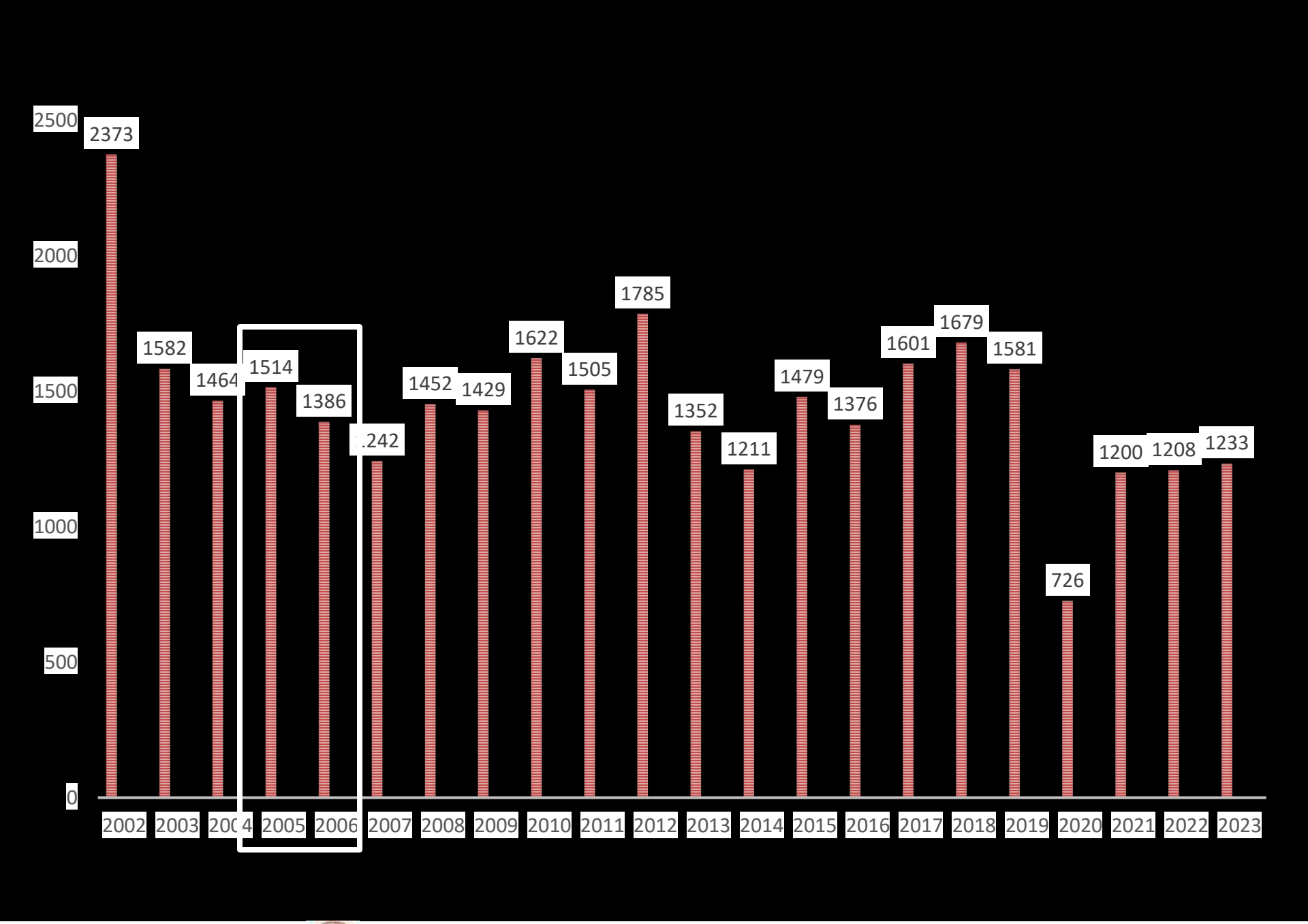
3D Stereophotogrammetric analysis of lip and nasal symmetry after primary cheiloseptoplasty in primary cleft lip repair.
Rhinology, 49: 546-553, 2011

ANALYSIS OF OUR OUTCOMES

Growth in 1000 consecutive patients with unilateral 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 1000 patients were assessed by 2 experienced surgeons as inter and intra observers along with an orthodontist and a speech pathologist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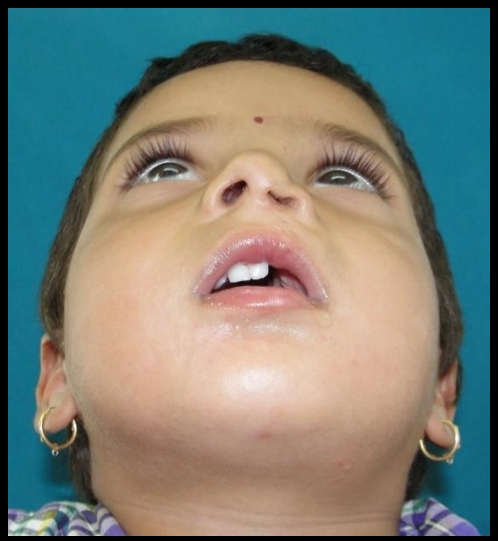
PATIENT 1

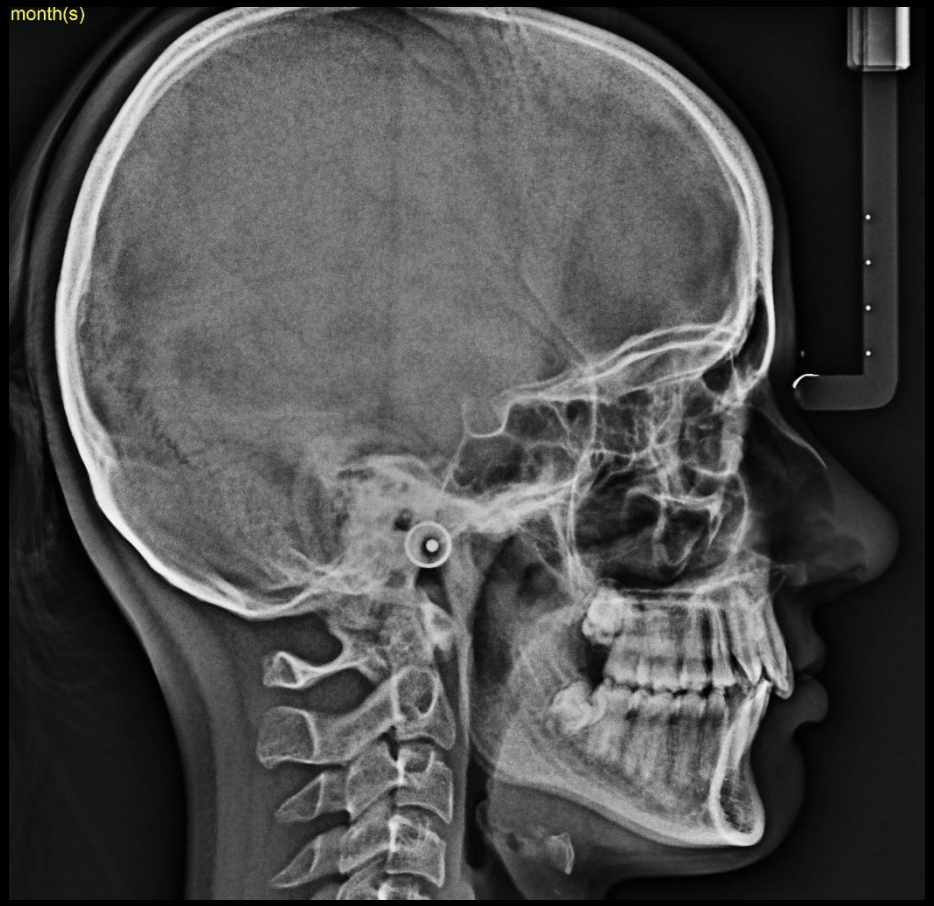


AFTER 18 Yrs

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

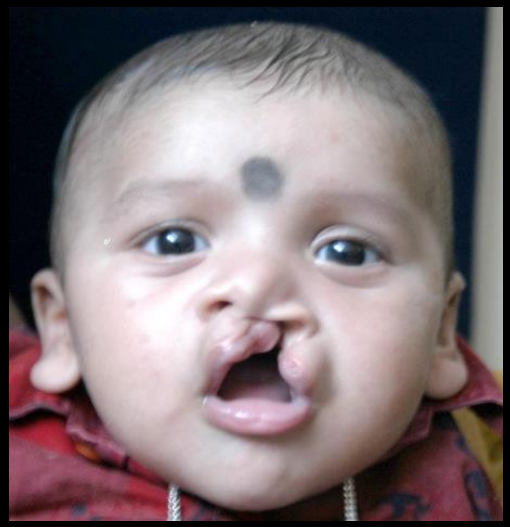
Procedures Undergone

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

RADIOGRAPHS SHOWING MINIMAL GROWTH DEFICIENCY

SPEECH SAMPLE EXHIBITING GOOD SPEECH INTELLIGIBILITY

PATIENT 3

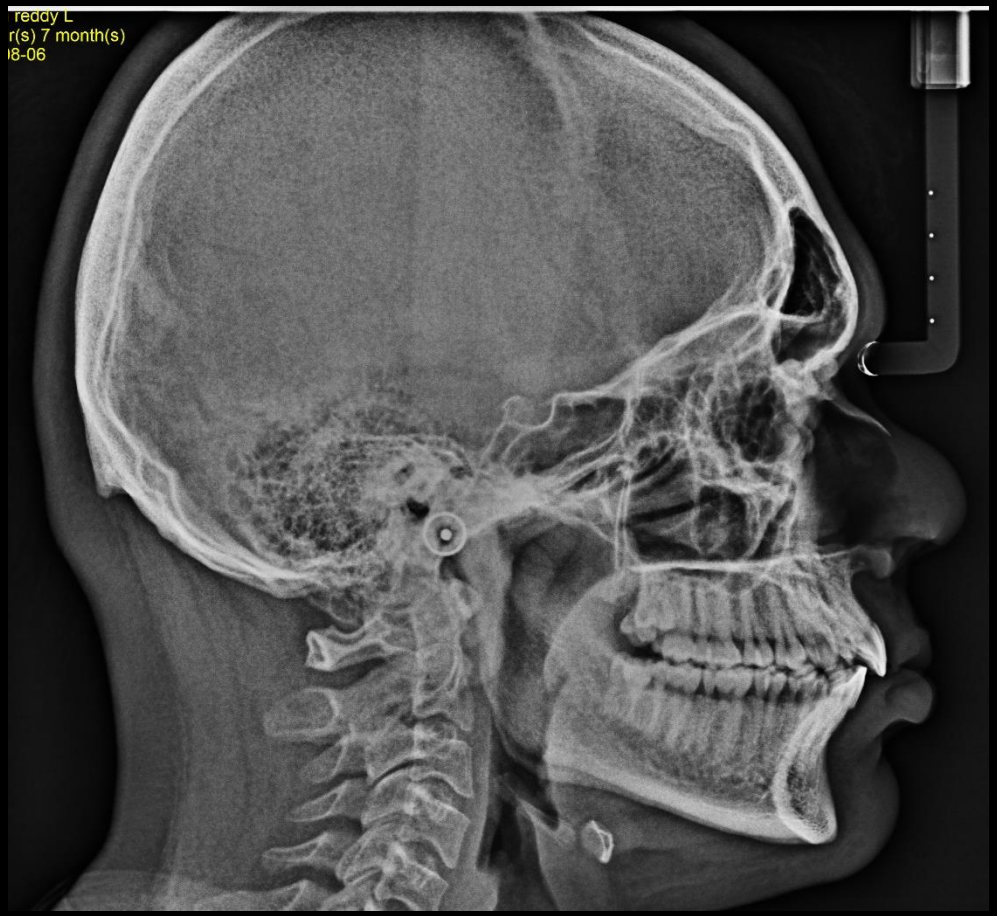


AFTER 18 Yrs

Procedures Undergone

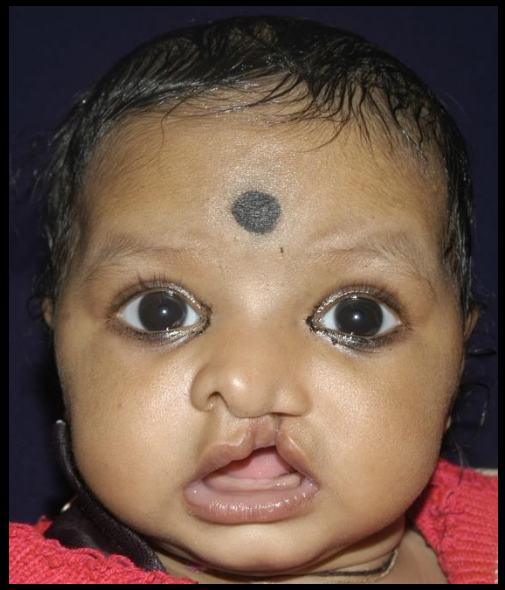
1. Primary Cheiloplasty
2. Primary Palatoplasty
3. Speech therapy
4. SABG
5. Rhinoplasty

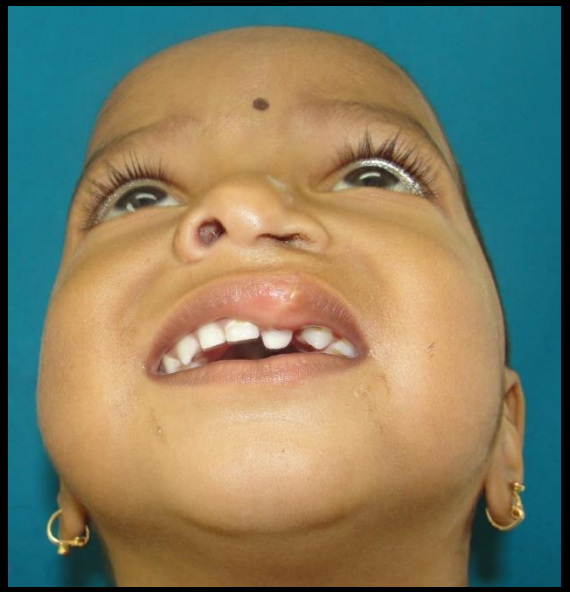
RADIOGRAPHS SHOWING NO GROWTH DEFICIENCY



SPEECH SAMPLE EXHIBITING GOOD SPEECH INTELLIGIBILITY

PATIENT 4



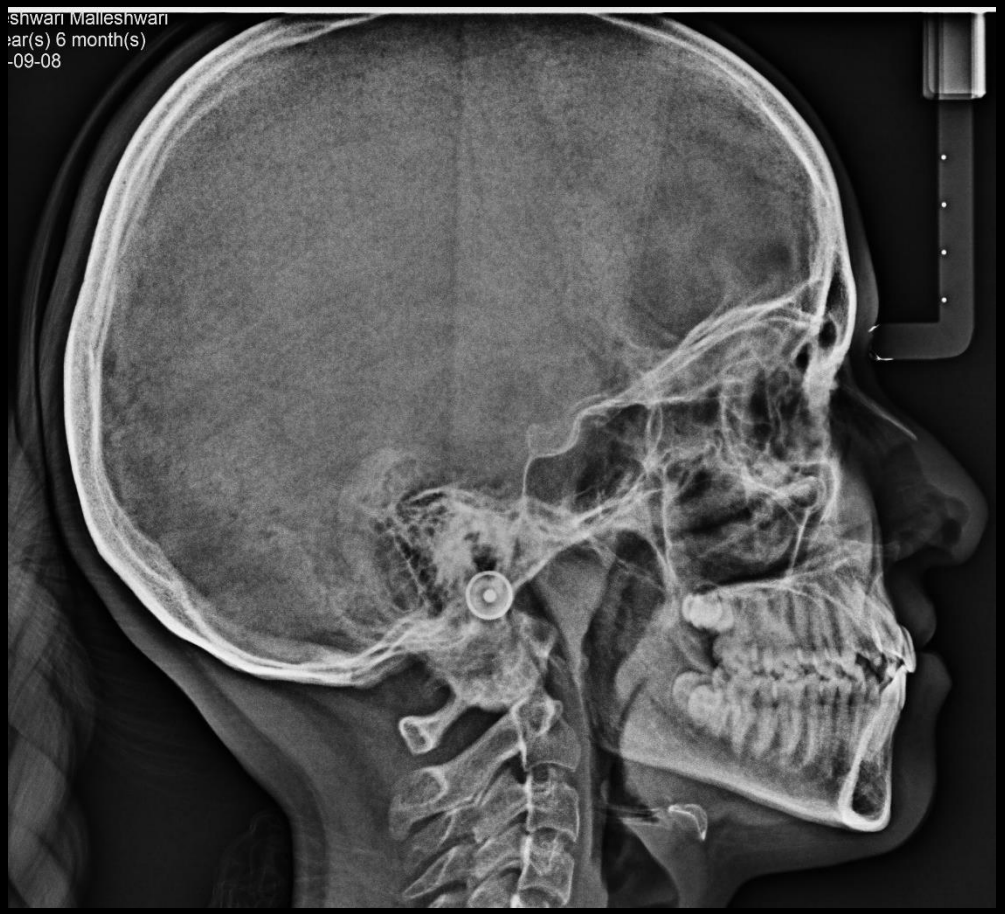


AFTER 18 Yrs

Procedures Undergone

1. Primary Cheiloplasty
2. Primary Palatoplasty
3. Speech therapy
4. SABG
5. Rhinoplasty
6. Ongoing orthodontic therapy for dental alignment

RADIOGRAPHS SHOWING MINIMAL 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

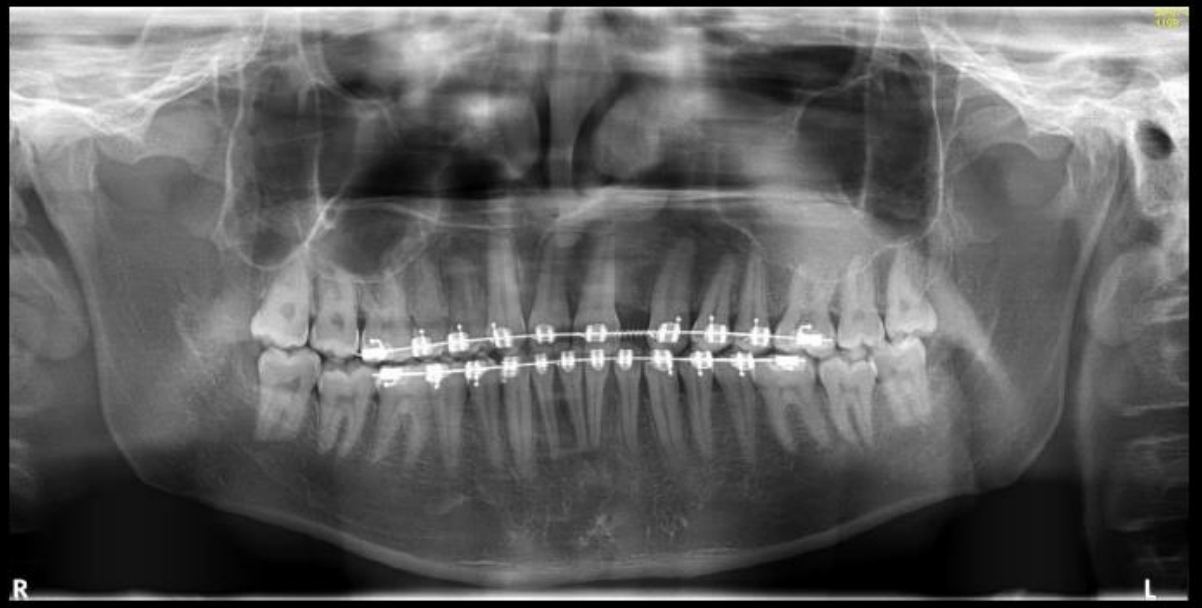
POST OP LATERAL CEPH

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 1000 patients operated for cleft lip and palate the outcome was as follows:

10% : Very Poor
10% : Poor
15% : Fair
35% : Good
30% : Excellent

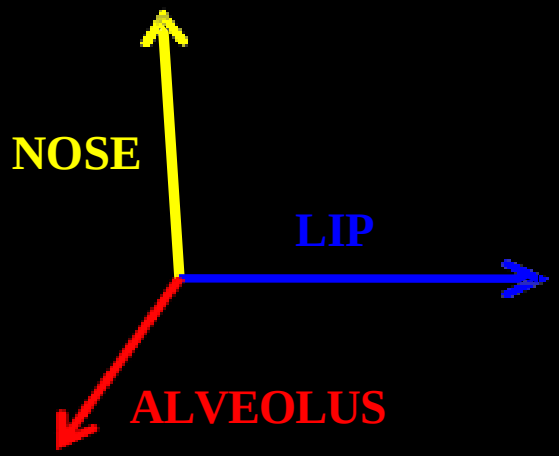
OBSERVATION AND CONCLUSION

Morpho-functional cleft repair causes minimal growth restriction

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

My Opinion

The cleft lip defect is a 3 dimensional problem



Only a MorphoFunctional approach that addresses all three dimensions will positively effect the repair of the Unilateral Lip.

My solution

CHEILOPLASTY, SEPTOPLASTY, PERIOPLASTY, GINGIVOPERIOSTEOPLASTY + NASAL ELEVATOR AND PASSIVE PLATE

Anatomy of Cleft Lip

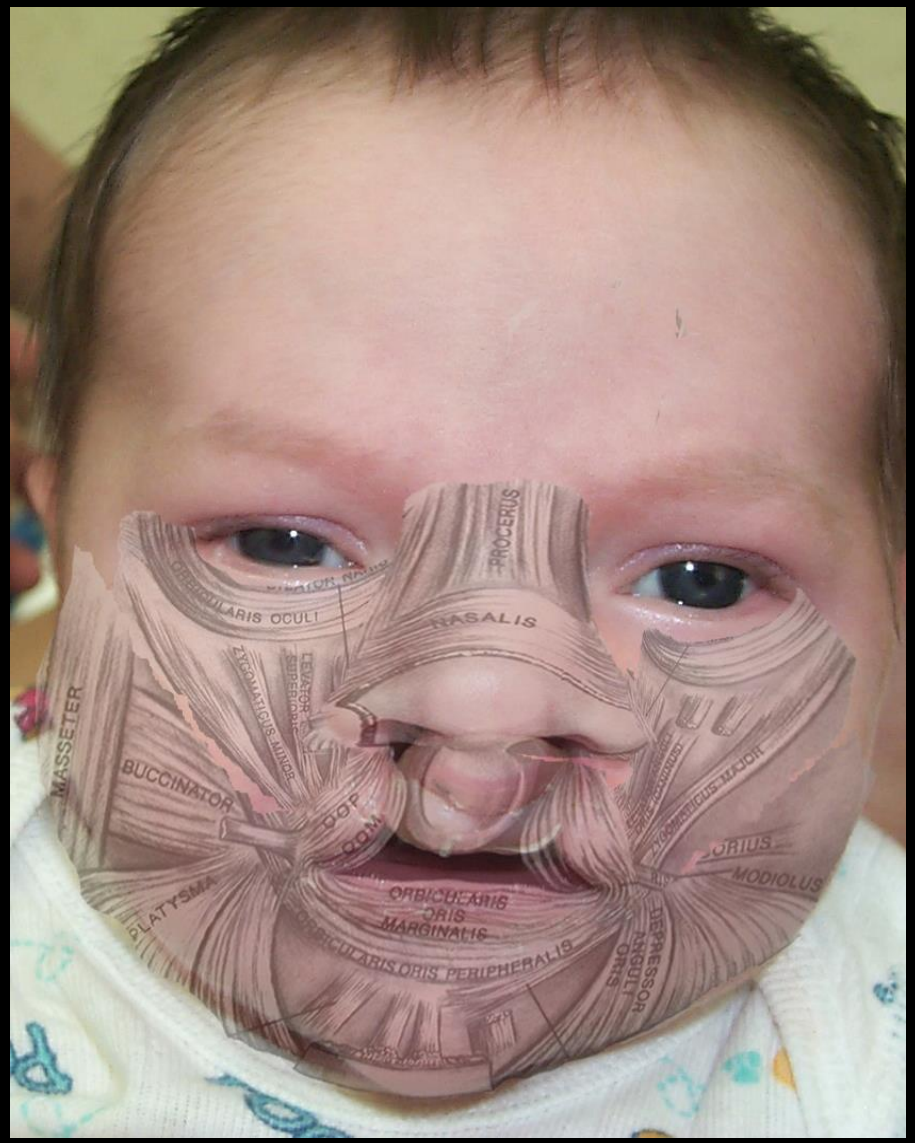
Bilateral Cleft Lip

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°)

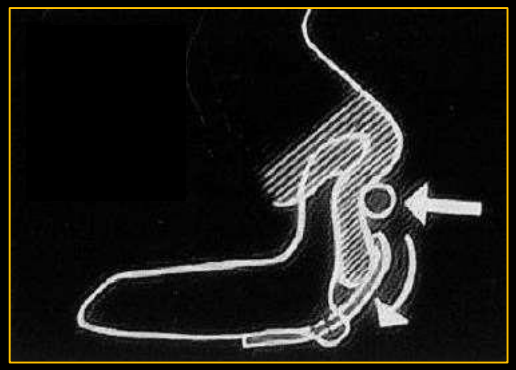
Before primary lip repair (NAM)

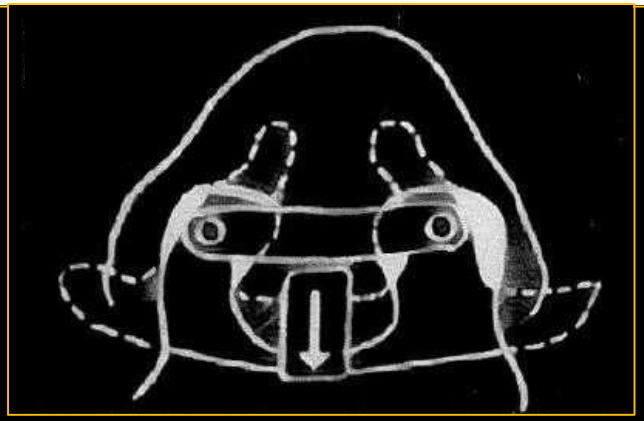
Presurgical Nasoalveolar Orthopedic Molding in Primary Correction of the Nose, Lip, and Alveolus of Infants Born With Unilateral and Bilateral Clefts

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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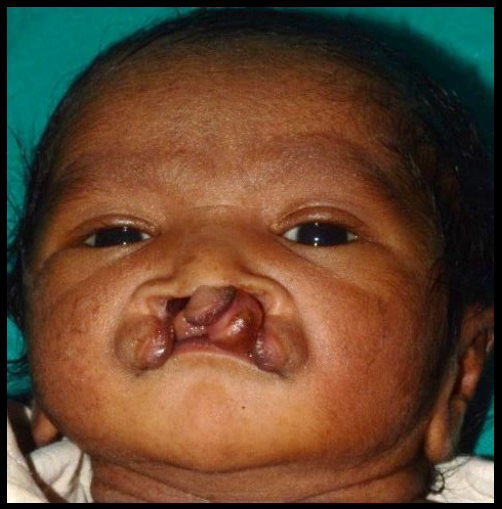
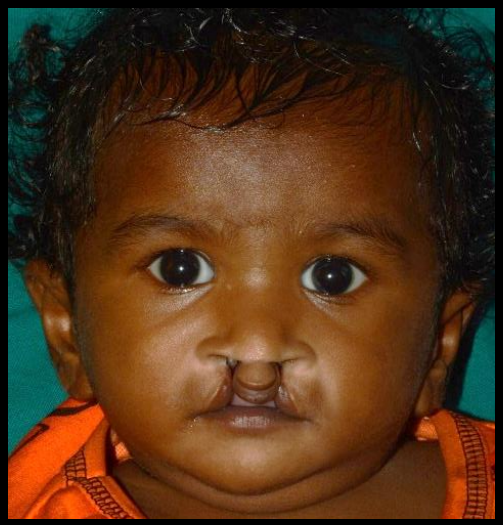
Presurgical Naso-alveolar Moulding

Pre NAM

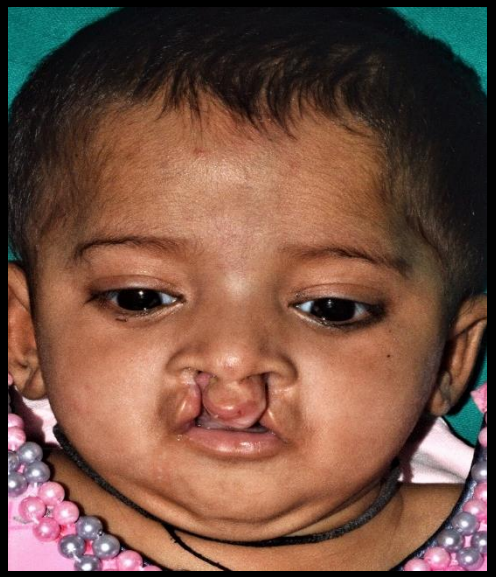
Post NAM

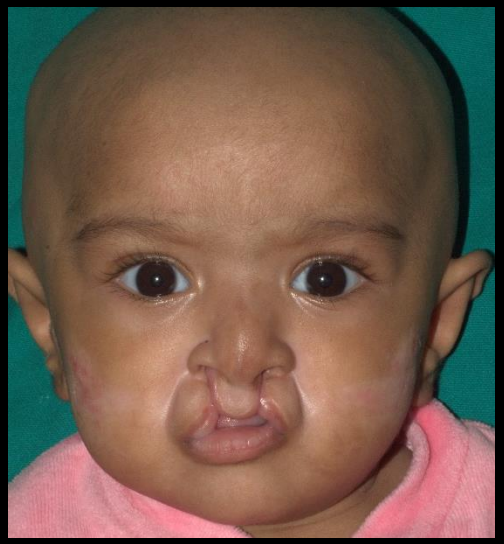




Pre NAM

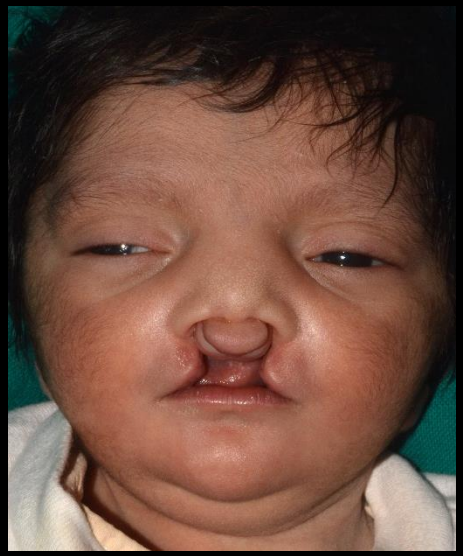
Post NAM

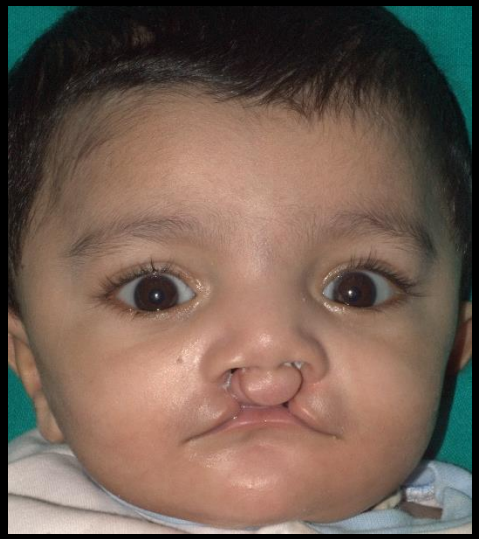


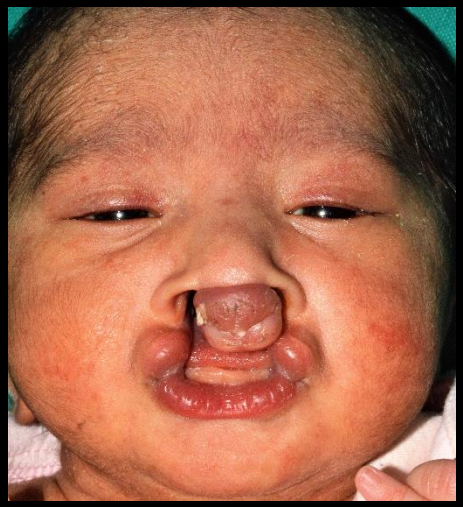


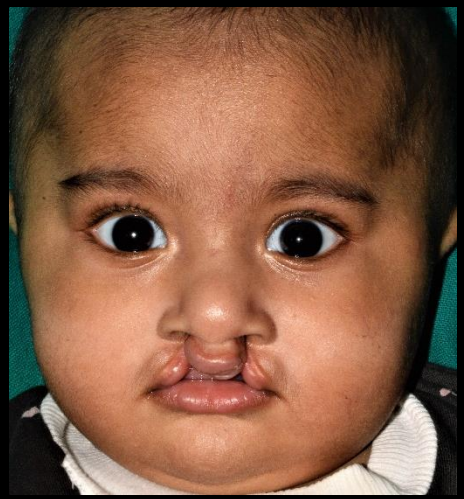
Pre NAM

Post NAM



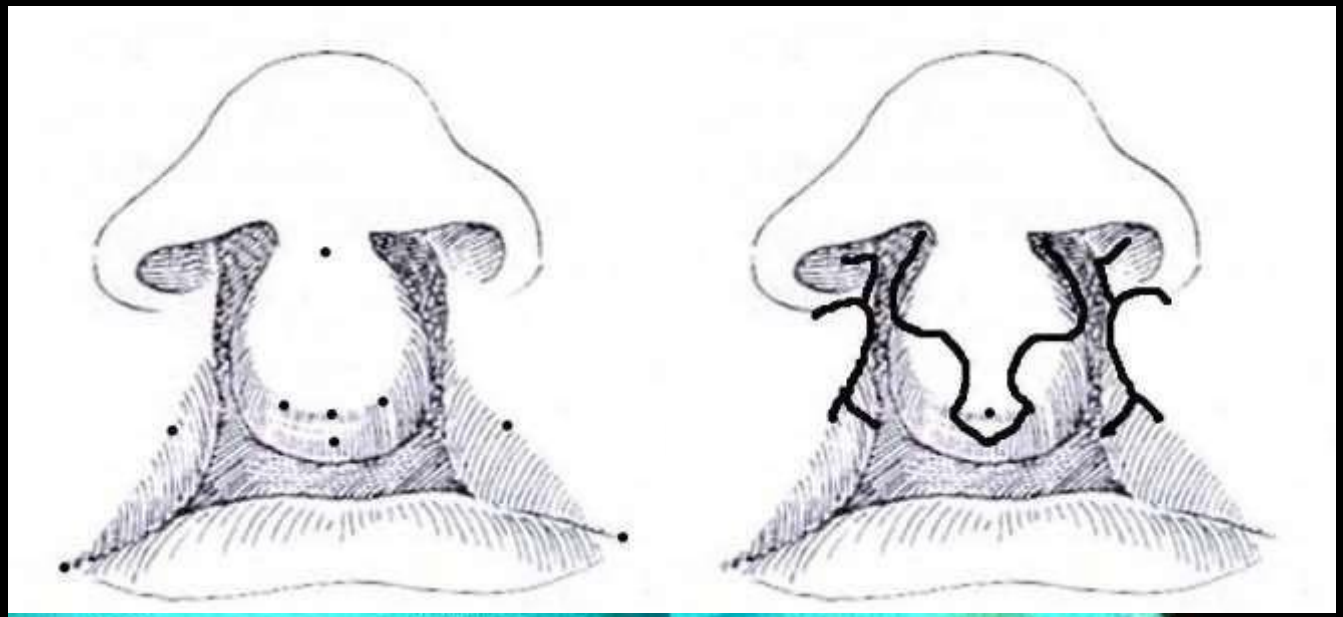




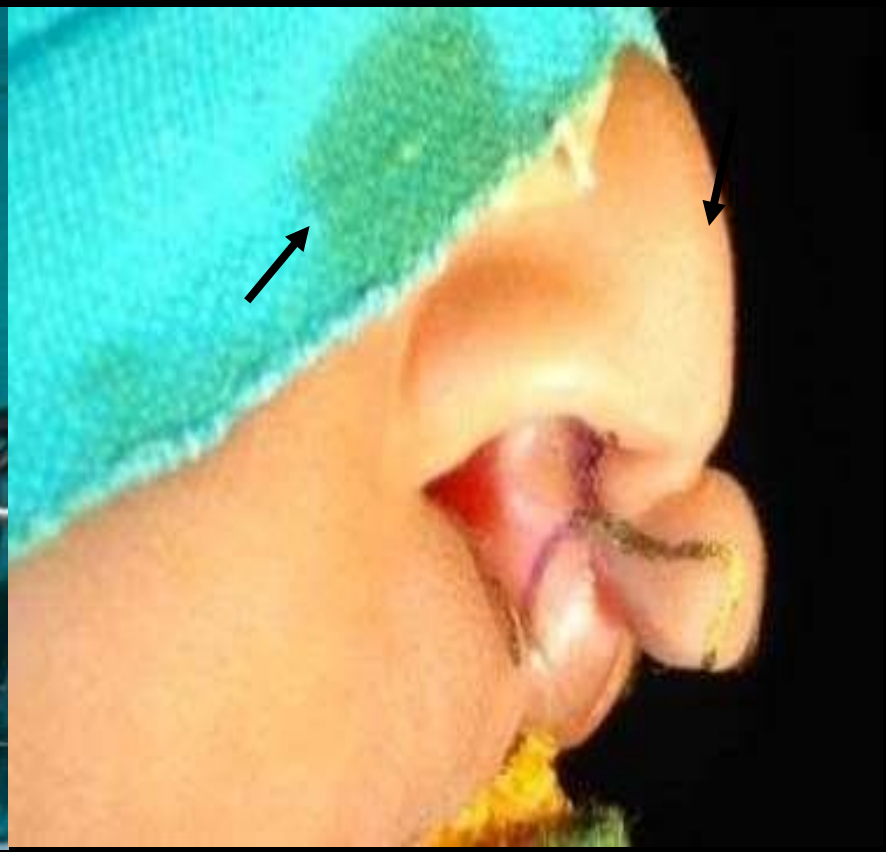


Bilateral Cleft Lip Repair

Incision design for bilateral cleft lip surgery

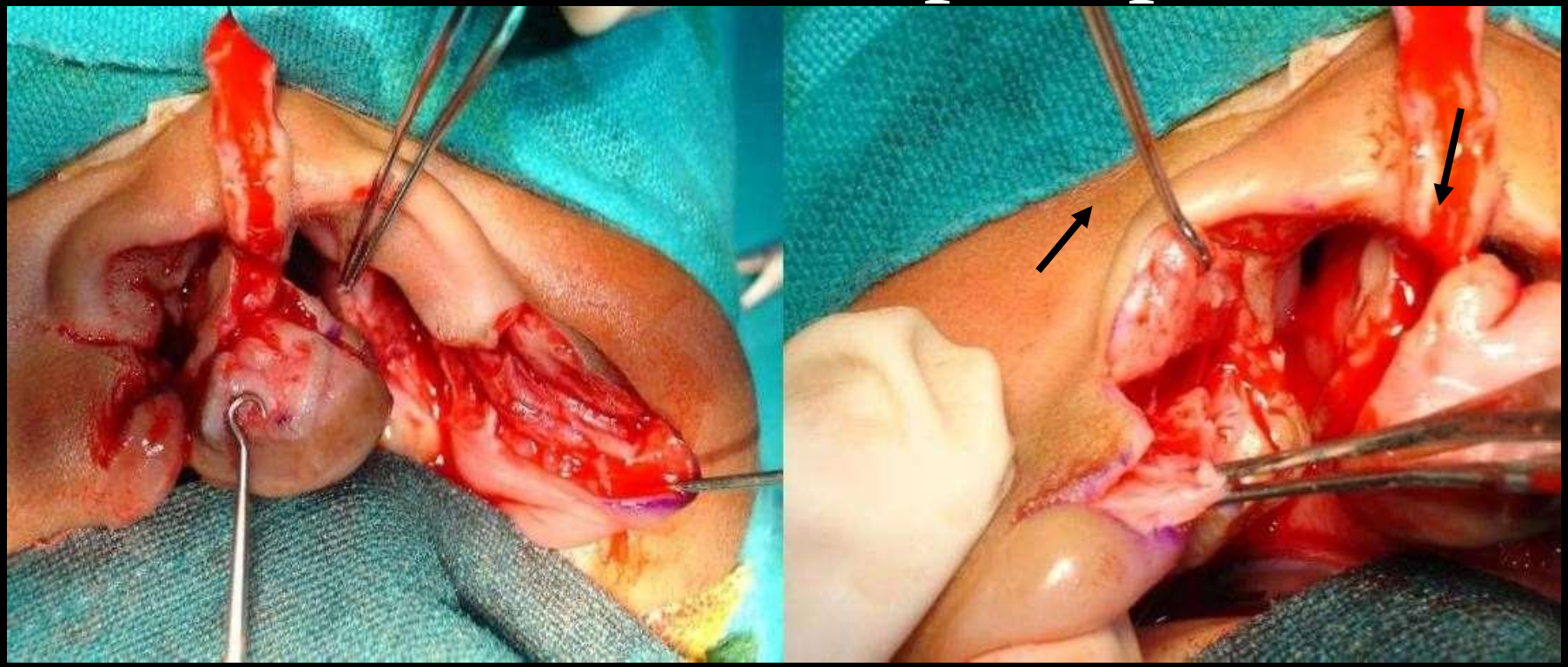


Bilateral Cleft Lip Repair



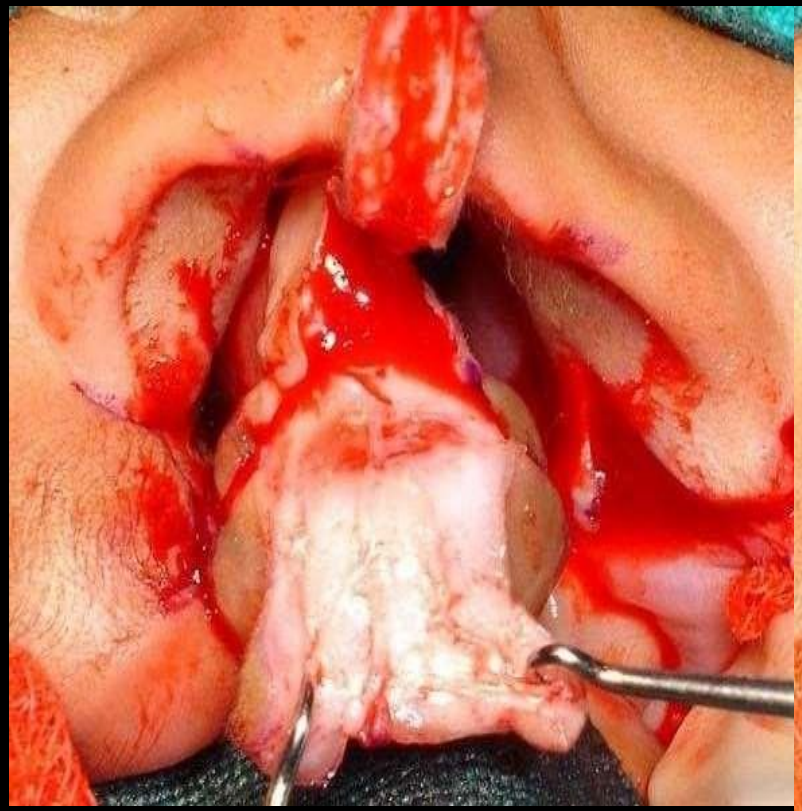
Afroze Incision

Bilateral Cleft Lip Repair



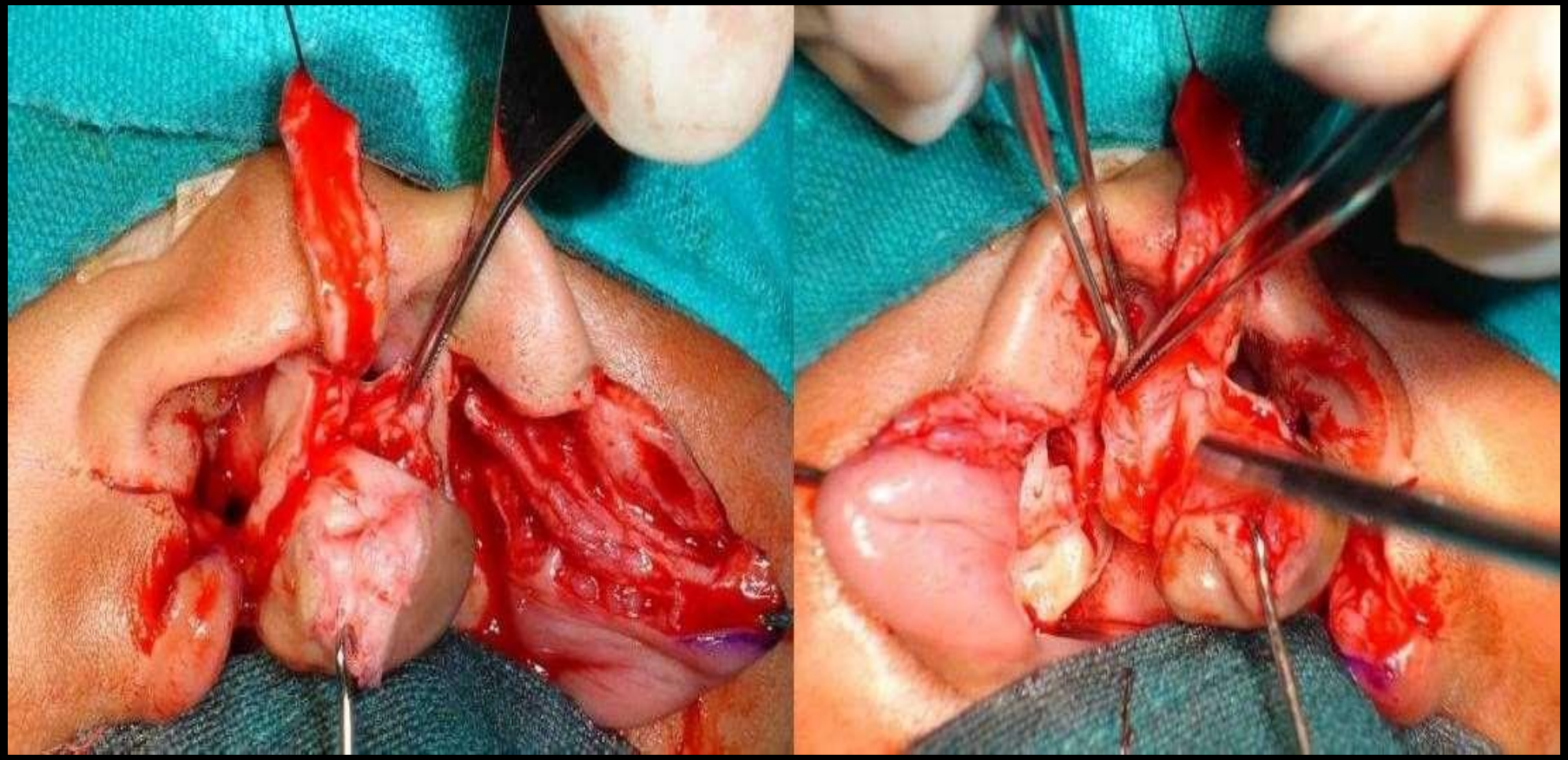
Minimal muscle dissection ensuring dissection of transverse nasalis muscle

Bilateral Cleft Lip Repair



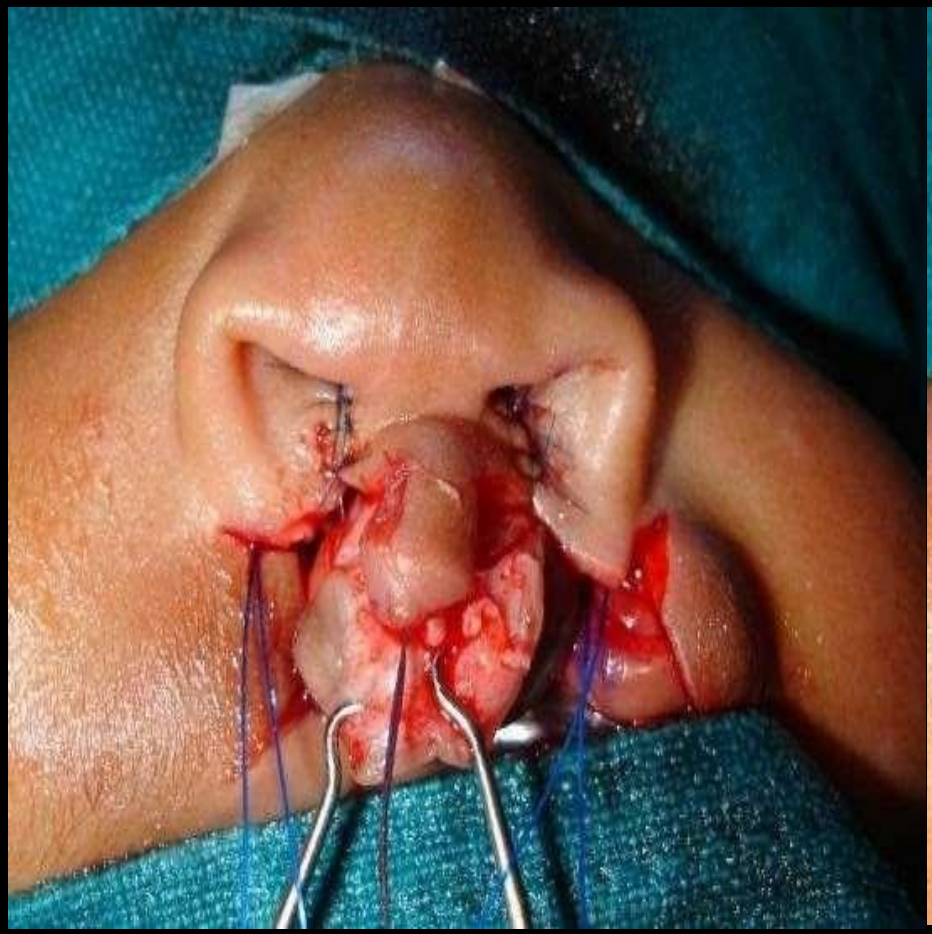
Dissection of the prolabium is done to separate vestibular mucosa from skin. All the fibro-adipose tissue is removed and the vestibular mucosa is trimmed

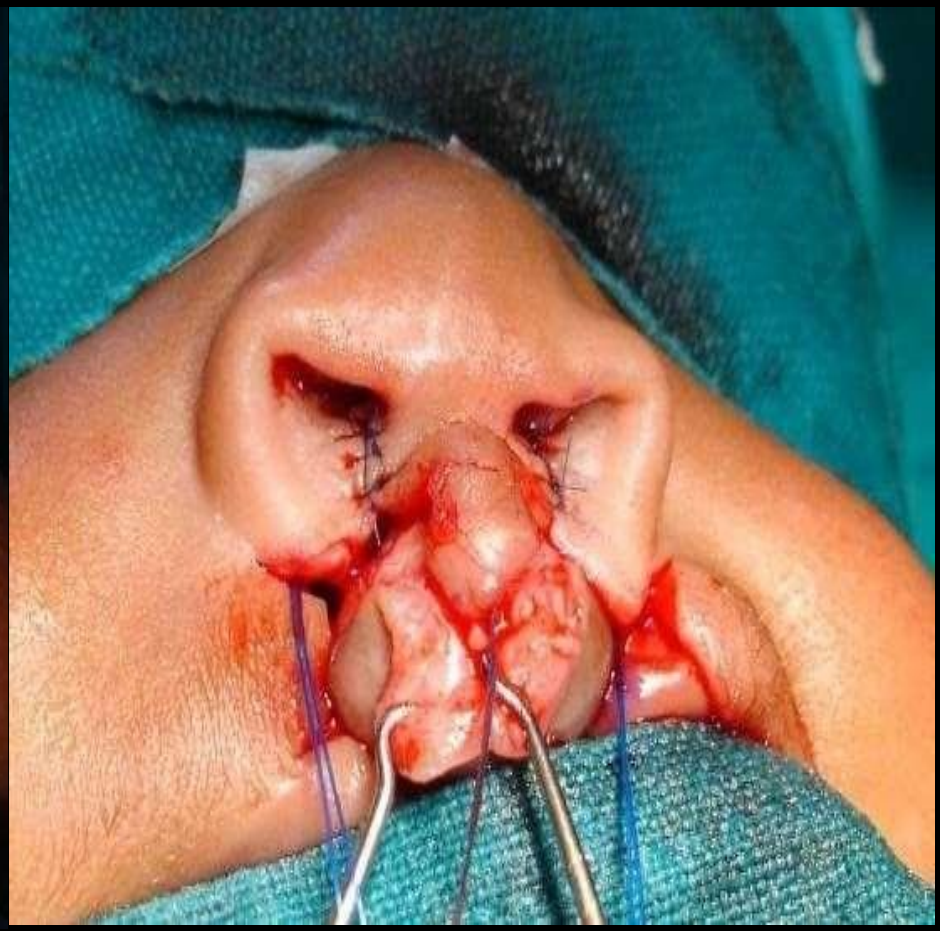
Bilateral Cleft Lip Repair



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

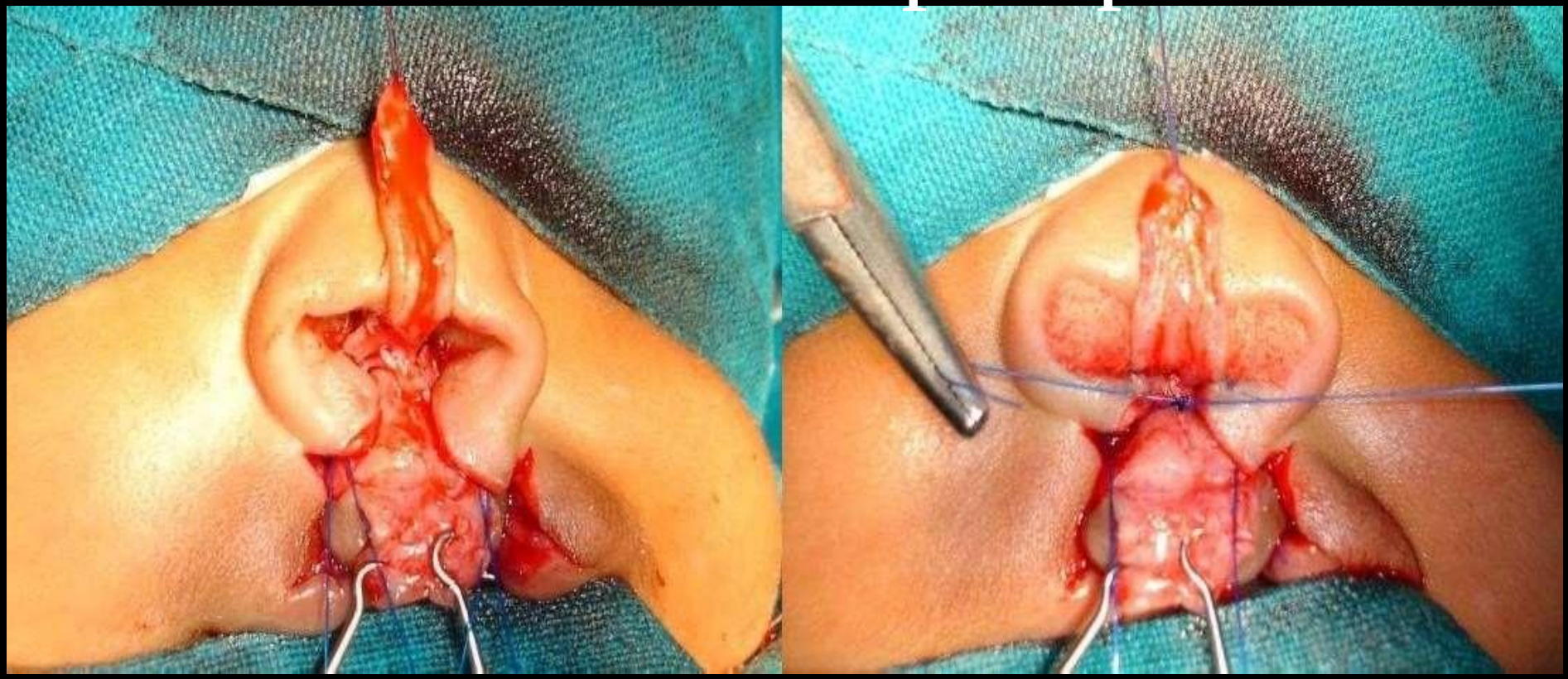
Bilateral Cleft Lip Repair





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

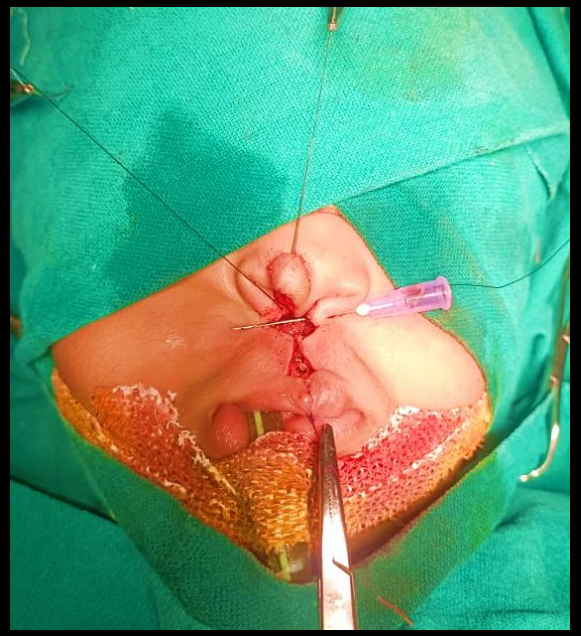
Vestibule formed by closing both side labial mucosa

Bilateral Cleft Lip Repair

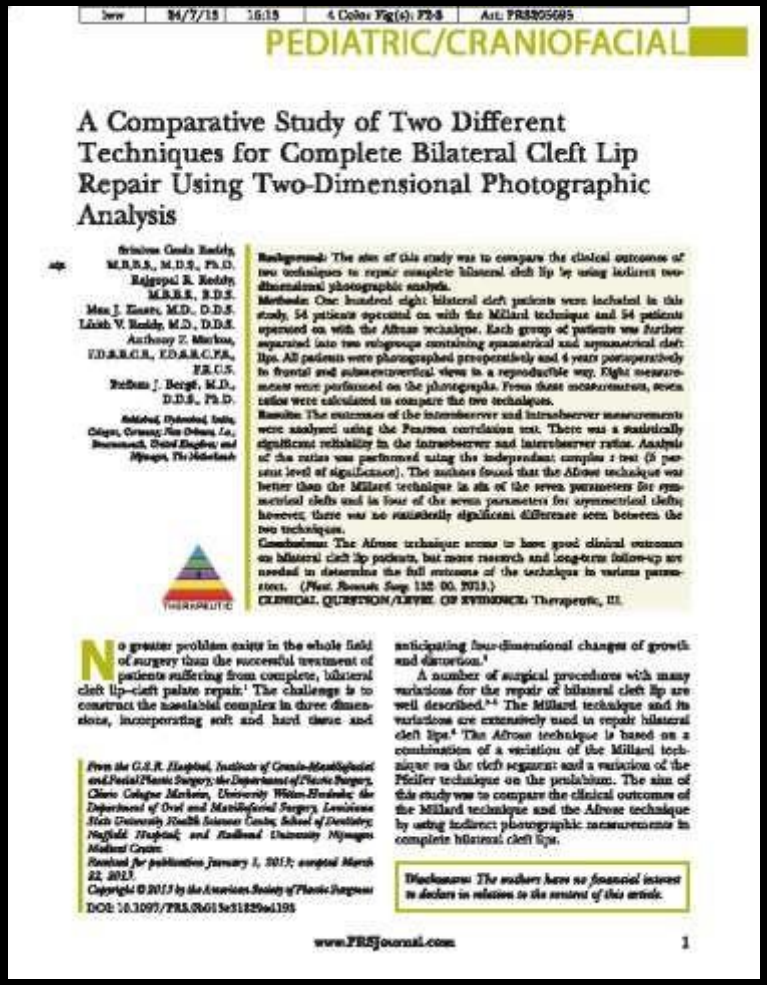
Muscle approximation and closure is done

EVOLUTION OF OUR

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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Barbara J. Bergé, M.D., D.D.S., Ph.D.

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.

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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

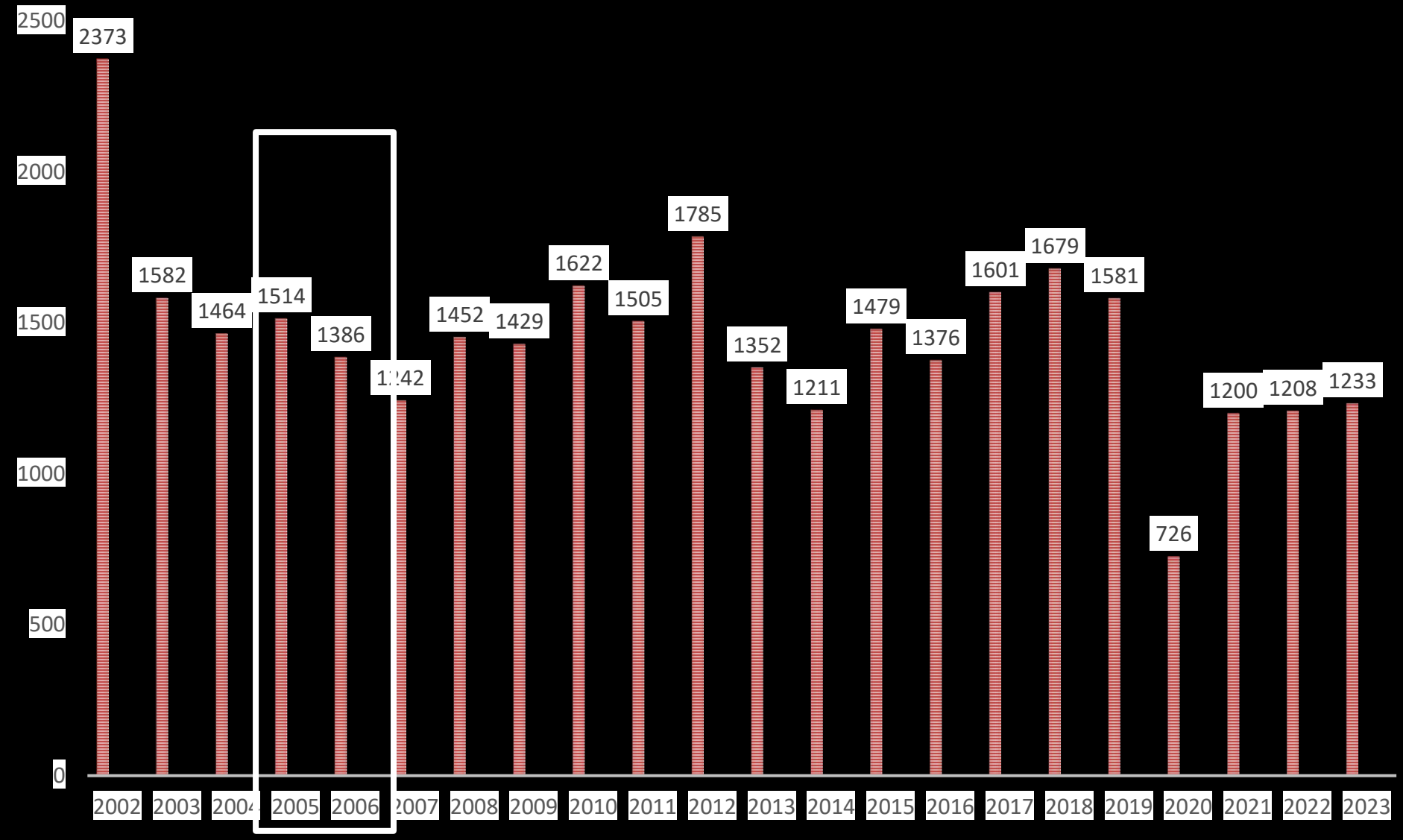
Source:
Gosla Reddy S, et al A comparative study of two different techniques for complete bilateral cleft lip repair using two-dimensional photographic analysis. Plastic and Reconstructive Surgery, 2013

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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2022
2023

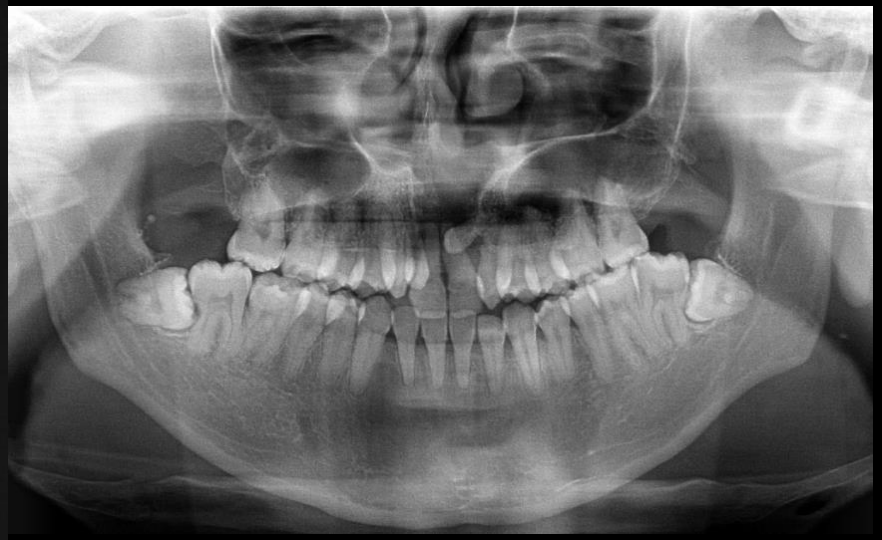
Patient 1

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

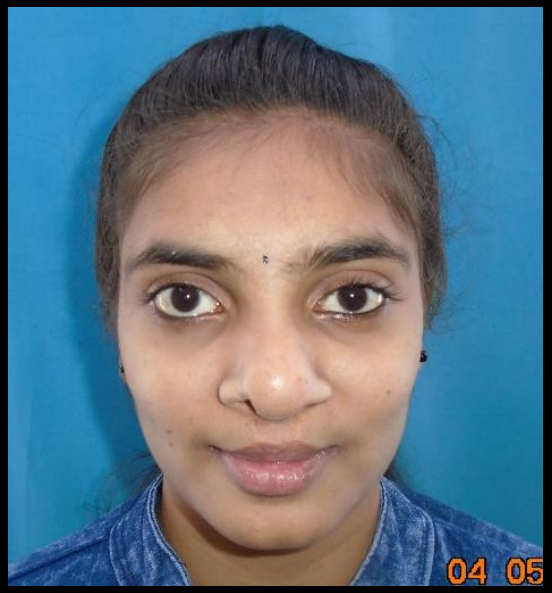
SPEECH SAMPLE EXHIBITING GOOD SPEECH INTELLIGIBILITY

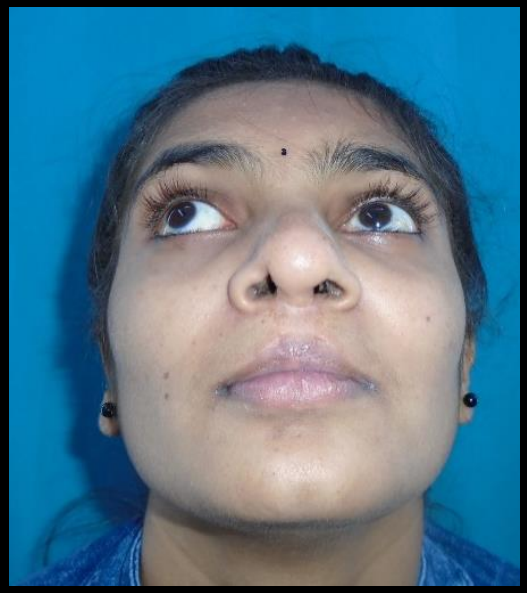
Patient 3






After 18 Yrs

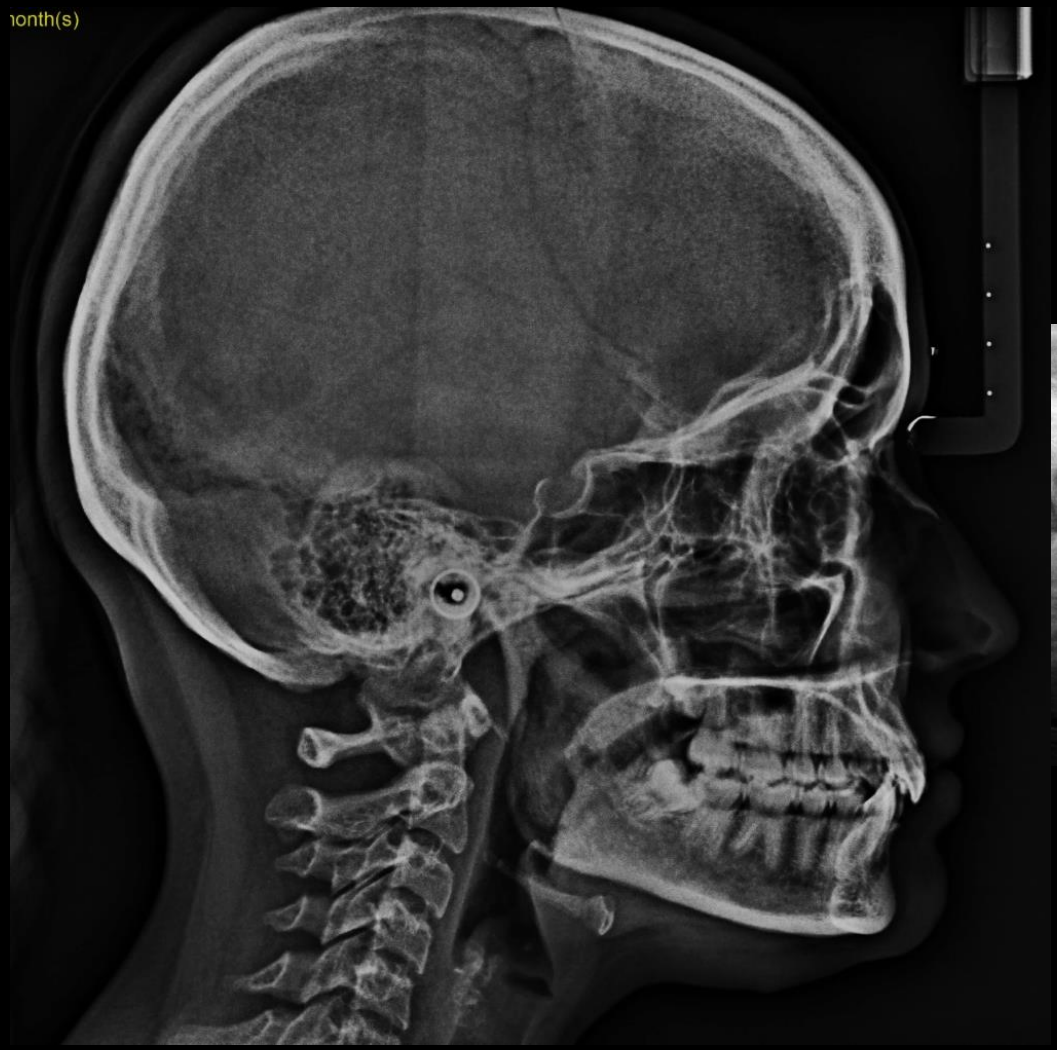




Procedures Undergone:

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

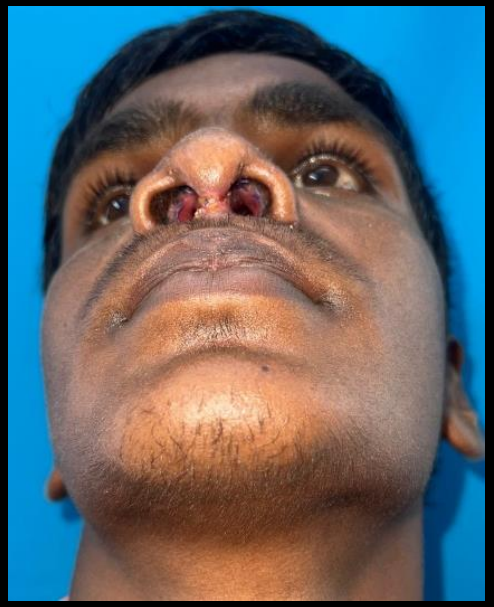
RADIOGRAPHS SHOWING NO GROWTH DEFICIENCY



SPEECH SAMPLE EXHIBITING GOOD SPEECH INTELLIGIBILITY

Patient 4

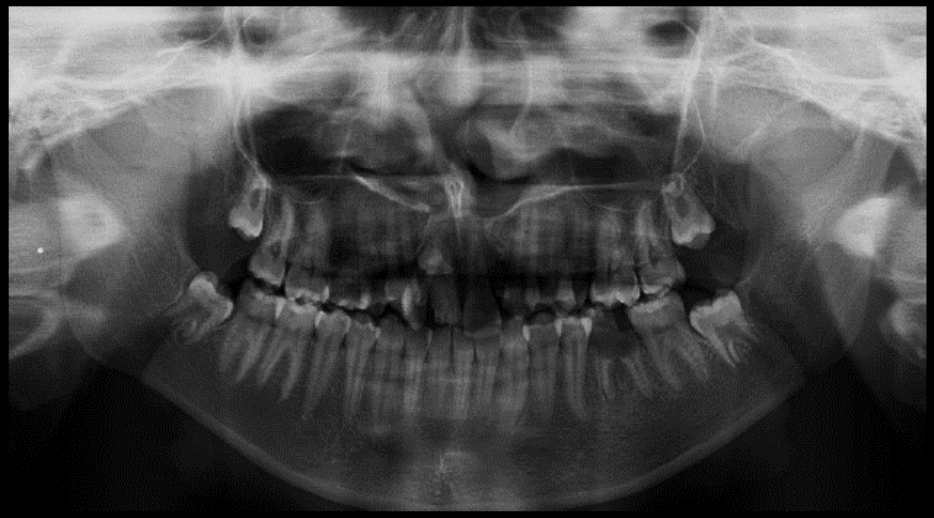
After 18 Yrs



Procedures Undergone:

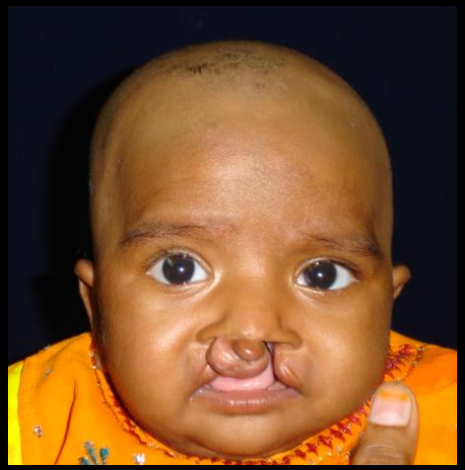
1. Primary Cheiloplasty
2. Primary Palatoplasty
3. Speech therapy
4. SABG
5. Rhinoplasty

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

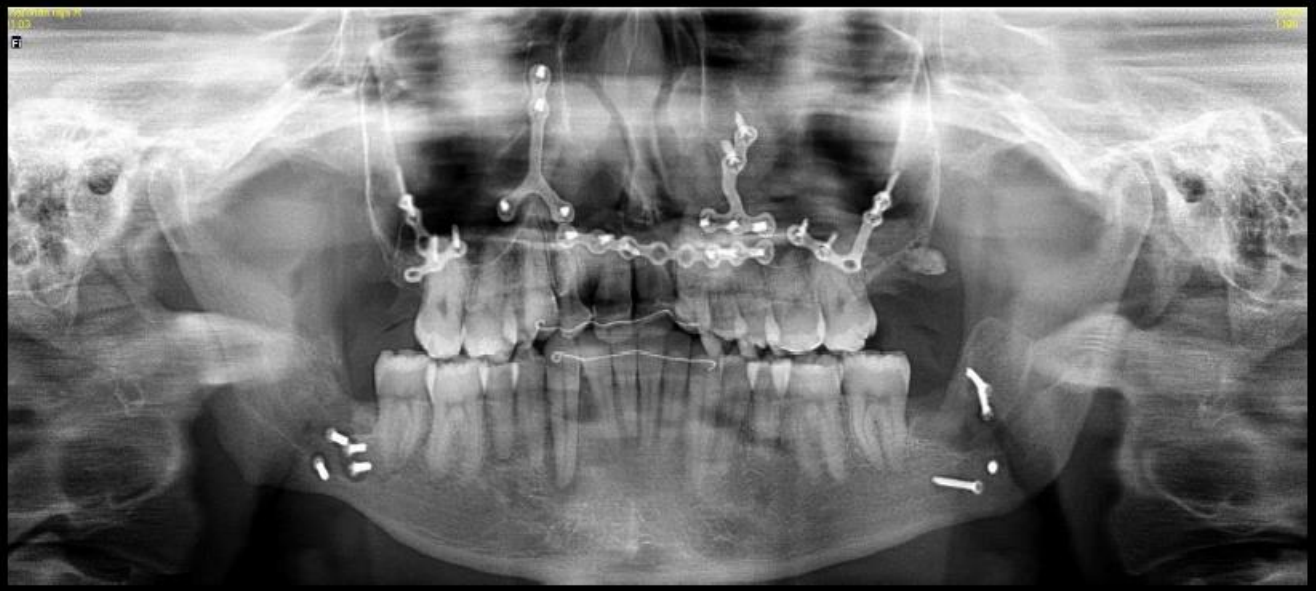
Patient 6

AFTER 18 Yrs

Patient presenting with midface deficiency

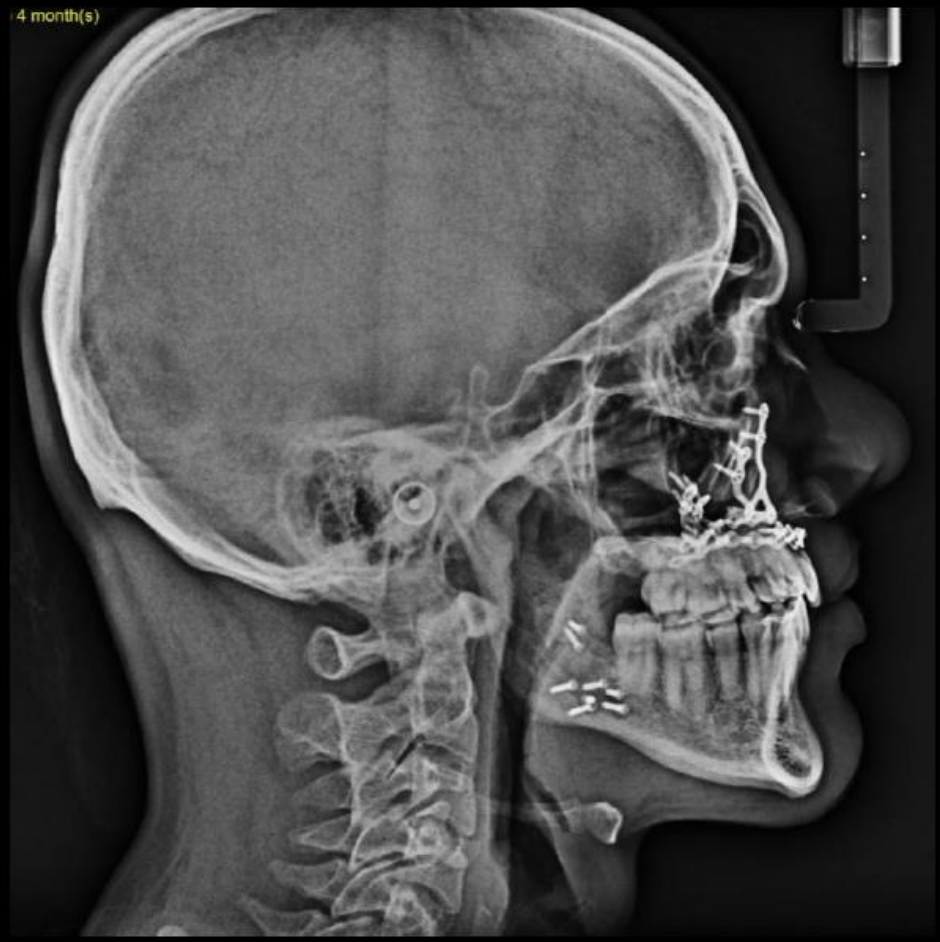
PRE OP OPG

POST OP OPG

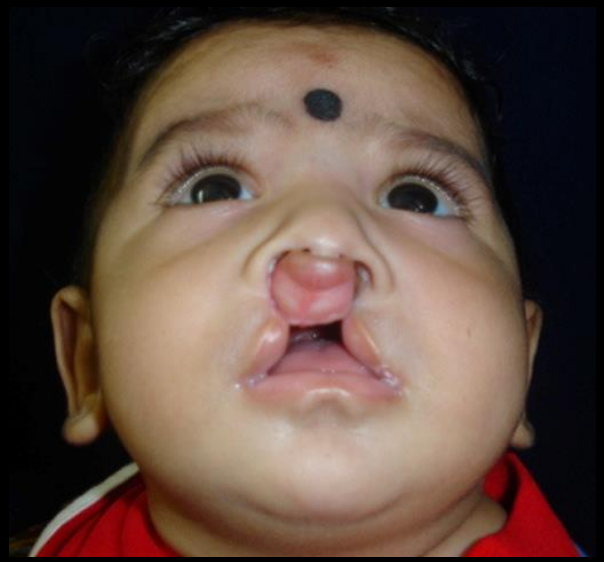


PRE OP LATERAL CEPH

POST OP LATERAL CEPH

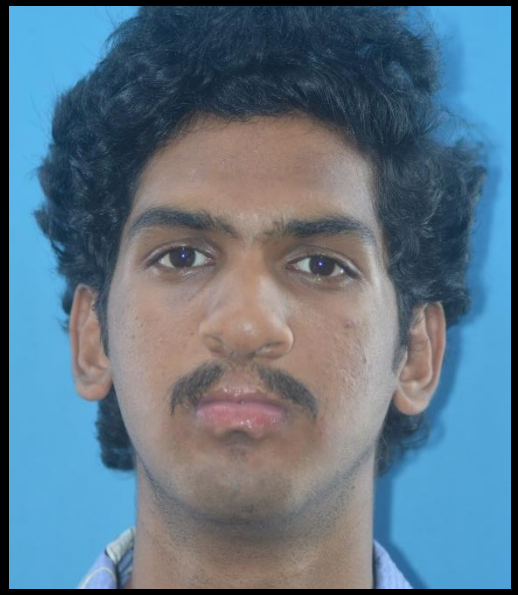


Patient 7

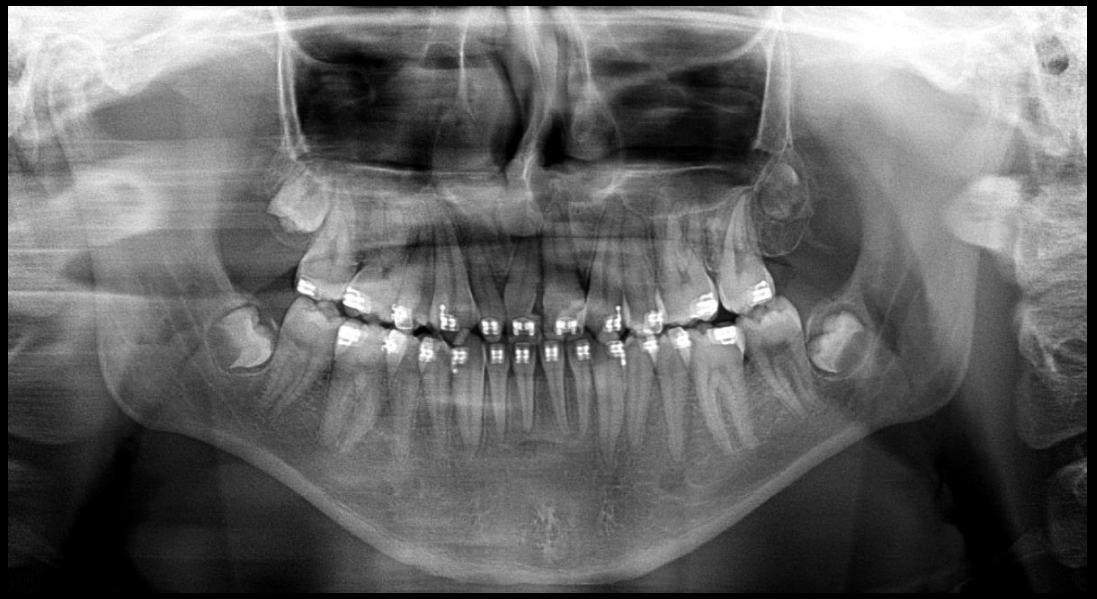


AFTER 18 Yrs

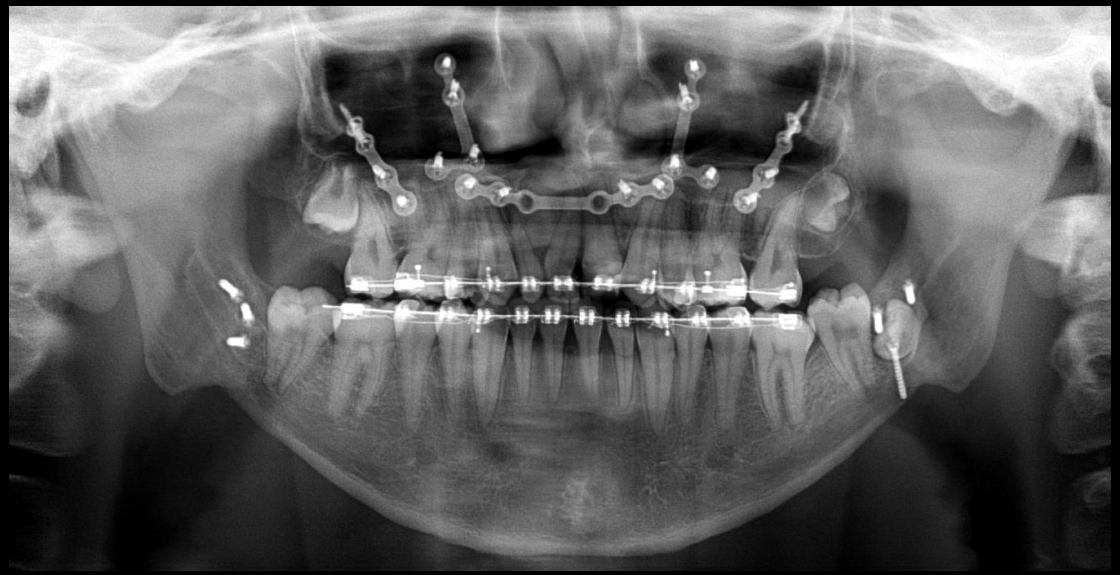
Patient presenting with midface deficiency




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

Bring the Smile Back

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