REPAIR OF WIDE UNILATERAL CLEFT LIP & ALVEOLUS - HOW IS IT DIFFERENT

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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 craniofacial surgeries are done every year
- 3 surgeons and 4 fellows with full support team
- More than 30,000 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 complete collapse 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

We don't believe in NAM. Due to burden of care.

So

We believe in Morpho- Functional Correction.



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

Tenis Stairs Redris, R.D.S.

MDS Reger M Weidt, EDS, IECS, MRC3 Regeroi R Reidt, EDS Likot, V Reidt, DDS, MD Power ID-amar, R.S. (Hous), Ph.D

A.F. Markes, FDSRCS, VISSRCPS

Hyperplan, Sonie, Park. Cale: Kingdon, and Constant. Here

recorded prooperatively. Analysis was based on postoperative assessment of the while coll, vermilies border, scar, Capid's bow, Ip length, and nosubleyinmetry and appearance of the alar dome and base.

Results: Comparison of the two cohorts using Pointon chiesquare testing for assoclution and linear trend found a Millard incision gave significantly better results for wrmilion match, whereas the Pfeifer method feel to a better possperative lap length. Preconceptions that soce particular technique was better satisf to certain preoperative chift anatomical forms were not process statistically.

Conclusions: Certain preciperative assumined features may lead the surgeon us choose one particular incident pattern in preference to acodier, but in this study, it was found that one technique was essentially as good as the other. This suggests that the mchanique for closure of the underlying tissues is probably of more importance. (*Plot. Revent: Seq*: 1121, 1922, 2018).

Surgenus have repaired the deformity of defifield for the past 2000 years, since the first atcenter performed during the Clain Donasty in China. Many reclinitions have been used since that une, and it is clearly apparent that no agreement exists as to which represents the optimion method.

Historically, incisents have been either straight line or broken line, but more tecenity, as the toesitieth resource dispetsion developed over two channer periods, but the first, up to 1598, and methoding Le Mesurer, decigatering of the incorrile cleft side sui-

Point the GSR Institute of Considered Surgery, the South Court Higher Surgiant Transing Program in Manaleynian Surgery, the Inviewes of Court and Macaleynian Vergen, University of Concession, Done Theoretic and Investments Surgery Unit, Konstantiable University and Devid Chip Carlos.

Economy preparation March 24, 2000, accepted December 12, 2000.

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Trainer' and Skoog' to conner these problems. A further alternative was described by Malck,' olio used a flap based on a precisely measured equilateral triangle to achieve perfect equality in the length of our class. **Disclosure:** Now of the authors has any financial interest in this work, and no completing interest are

achieved with some sacrifice of the ipsilateral Gapitt's how. This mancareer, however, tended to pro-

doze an aesthetically and/oatable peaking of the lip.

In the second half of the century, several attempts serve made to counter this discretorining. Tenuissor'

unlowed a triangelar flap on the enternal wirflace of

the lower margin of the fig. while Petit and Psanno-

used a superiorly haved flags. Nevertheless, became

of was contracture, this latter approach also pro-

stored imacceptable aestirent outcomes. A combi-

nation of superior and inferior flaps was used by

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declared.

Superget O Avenuale Society of Paulit Surgeryn, Ultractional Astronaution of Sin Article & provided.

- 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 columellacause 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







Source:

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

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, PhD3

Abstract: Repair of undateral cleft hp is a fascinating and challenging procedure. Although a great number of operations have been described for the unitateral cieft his repair, note fulfill all the plastic surgical criteria, and in most cases, cleft hij repairs require secondary operations in an attempt to achieve described goals of primary eliciloplasty. The Afrore meiston is a combination 2 incisions, that is, the Millard meision 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 curveof the Pfeiffer flap is positioned in the triangular defect formed by the movement of the Millard flap. The proximal curve lengthens' dewnward to receive the Millard's "C" flap. The advantage of this technique is that there is no tension on the postoperative scar because the metsion is essentially horizontal in nature and the contracture of the sear accurs horizontally rather than vertically Primary sepial repositioning is performed, which provides stability and exact positioning of the previously lifted alar critis of the cleft stile and nasal tip, and the nose can grow in a balanced way with equal mascular force being exerted on both sides. This incision can be used in all types of complete undateral cleft hp researcless of the width of the cleft, shortening the cleft hp segment,

Key Words: Complete unilateral cleft hp. Afroze metsion, cheilasentopiasty

(J Craniata: Surg. 2009)230: 1735-1736).

Report of unlinteral cleft hip is a fascinating and configuring proference of the sums of a unlinteral cleft hip repair are to induce a sinin length on the cleft side maching that on the normal sele, an incompression residual scar that does not cross anatomic boundarres, an adequate Copie's lows within an absence of natching of the vermilion border (whitshe tip deformity), and an absence of peaking of the vermilion at the Capita's bow on the cleft side. Although a great number of operations have been described for the unliateral great number of operations have been described for the unliateral

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Andhra Pradesh 5000597 Isaka: E-mail: gesksikeranitofacadmentic org This article did nut sagaine any sources of funding

The authors declare that they had no illumental interests or communical associations doesn't the course of this shady.

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BSN 1046-2274 DOI:10.1097/SCS.06013-3180623-41

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cleft lip repair, none fulfill all the above criteria, and in most cases, each lip repairs require secondary operations in an attempt to achieve this described goal.

The Millael repair is based on a obtainen flap on the nano-left (medial) side complete with an advancement flap on the defit Interal) side. One of iss main advancement flap on the defit Interal's disc. One of iss main advantages is that the technique allows adnustment as the operation proceeds, with further rotation and advancement movements tables with further rotation and an issue as sear cossing the mainless of the site of the site of the process of the site of the site of the site of the site of the Preifing methods and the site of the site of the site of the conded methods and the site of the site of the site of the conded methods and the site of the site of the site of the conded and translated to the cleft side using a flexible wine, thus determine satural anatomic point. The 2 entries are brought by getter sinch that the highest and hences points of 1 entries are appressimated with the curresponding highest and lowest points of the offset, from site of the site of the offset of the offset of the site.

On comparison of the 2 sectimanes, each has its own advantages and shortcomings. The Millard flag produced before results when considering vertration approximation. In this respect, if is in the to more flexible than a straight line design, and the optimize in able to position the rotation flag on the noncieff side where it is reduced likely to prosince the best outcome. This is intringing airs has an improved enformer where prooperatively the line is wider on the noncieff side. This would lead to a reduction in rotational regimenents of the flag on the medial side, requiring a layer distortion and a Copiel y low with better form. Repairs using flags according to Prefifter's design resulted in a better length of lap postoperatively by its name, the more waves incorporated in the individent greater the height of the lip. A prominent wave placed just above the meascontaneous junction will reliab to a theory.

Afforce incident is a combination of 2 incisions. Millard incision on the non-left side and Pfriffer motion on the cleft side. The flag design is such that Millard flag on the non-cleft side is natured downward, and the peak of the aligned curve of the Pfriffer flag to flag design at the intangular defield formed by the movement of the Millard flag. The proximal curve lengthene downwards to receive the Millard CC 'ling. The advantage of this feedmate that they is no tension on the postoperative scar because the mechanics is existing a structure of the scar occurs horizontally rather than vertically. There is also no pressure on the Cupad's bow for the same reason.

INCISION MARKING

On the non-left side, the Currel's how is marked by 3 points. Point 1 is the highest point on the contributeral white full, point 2 is the deepest point on the white full. Noint 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 cieft side, point 4 is madeed at a point where the white roll begins to field (Figs. 1-3).

The Millard mession on the noncleft side is extended from point 3 along the panetion of skin and cermillion microsa and further

The Journal of Cranicfonal Surgery • Volume 20, Supplement 2, September 2009

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Afroze Incision for Functional Cheiloplasty, J. Craniofac. Surg. 20(8):1733-1736, September 2009.

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.



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.



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. <u>al.</u>; J. Craniofac. Surg. 20(8):1733-1736, September 2009.



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



SEPTUM IS KEY

The septum is positioned in its rightful anatomical position

Source:

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



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.



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. <u>al.; J</u>. Craniofac. Surg. 20(8):1733-1736, September 2009.



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.

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



Measurments of S_vO₂, rHb, flow, (O₂-metab.) in 2 anatomical planes:

Tissue spectroscopy



Laser doppler flowmetry



$0.4 \text{ mm} \rightarrow \text{skin}$





8 surgical landmarks

22 normal

33 unilat. Cleft preop

29 unilat. cleft Late postop





mean age 62m (SD 43)

mean age 9m (SD 6)

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



PEDIATRIC/CRANIOFACIAL

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

Andress A. Mueller, M.D., DMD. Dictor Schumann, M.D., D.M.D. Reigopal R. Reddy, MBBS, BDS. Katja Schwenzer-Zimmerer, M.D. D.M.D. Magdalena Mueller-Gerbl, M.D. Hans-Florian Zeilhofer, M.D. D.M.D. Hermann T. Saller, M.D., DMD. Scinivas Gosla Reddy, M.D., MBBS, PLD. Levi and Sarid, Industriest; and Sailshal, Bylandal, India

Beologround: Cleft Bp repair sinus to normalize the disturbed anatomy and func-tion. The authors charmined 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 ($\kappa = 22$) and in patients with unilateral and hilateral cleft lip-cleft palate. The authors measured these parameters before lip repair (n = 29 and n = 11, respectively), at the end of lip repair (s = 27 and 10, respectively), and in the late postoperative period (a = 33 and a = 20, respectively). The amerial flow velocity was measured in unflateral groups at the same time points (n = 10, n = 11, and n = 12, respectively). Batistical differences were determined using analysis of variance.

Results Before surgery, the arterial flow velocities and microcirculation values were shallor on each side of the face and between groups. The microcirculatory flow was significantly higher in the probabium of hilateral patients than in the philtrans of controls. All circulation values in unflateral 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 nazalls muscle

THERAPEUTIC

Constantions: These appears to be an invitatic circulatory deficit in unitateral and hilteral cleft lip-deft palate patients. The increased flow in the probabium indicates a strong hemodynamic need in this territory, compelling its vacular preservation. Whether rangical preservation of the namin particular artery is of long-term benefit about the addressed in fedure studies. (Plast. Revear. Sorg. 130: 1120, 2012.) CLINICAL OURSTION/LEVEL OF EVIDENCE: Therapeutic, V.

left 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 anatonly has remained largely unaddressed in current

Prom Counternatillefastist Sungery, University Elseptiel Band; for Elighten Research Center of Communatillyformit Bangrey, University of Band; the G. S. R. Excitate of Communatillyformit and Possite Sungery, One Instantiant, Manar-mantage, and Maduchathal Annuary, Laboutory for Pam-tional Measurehebarg: and Colf-Colliver International (OZ Positions for publications Journary 17, 2012; accepted May 12, 2015) 23, 2012

2. Second in part of the 20th Congress of the Durajona Association for ConviennesiBefored Surgery, in Druger, Belgium, Sapandar 14 through 12, 2010; the Sixth International Bored. Addamates I 4 through 1.1, 2014 the states resonances corre-ficient Symposium for Inseasoft and Vietnessy Technologies in ConviousnetRightent Surgery, in Basel, Switzerinse, Janes IT through 19, 2010; and Its St. Duropases Consistent Con-gons, in California Association Sciences II. Conference of the Conference of the Science of the States IT. Conference of the Conference of the Science of the Science of the Science of the Science II. Conference of the American Society of Planets Surgeons DOI: 10.1097/295.0b013e518267d4fb

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surgical techniques, and the reasons for this have yet to be emplored.

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 oursery.

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.* Gentle surgical soft-tistue han-

Dischanges: None of the authors has any conflicts of interest to declars.

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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 Velocity and Microcirculation in Unilateral and Bilateral Cleft Lip Repair Plastic and Reconstructive Surgery 130 (5): 1120-1129,2013

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PEDIATRIC/CRANIOFACIAL

Comparison of Three Incisions to Repair Complete Unilateral Cleft Lip

Strutvas Goda Recht, M.D.S. M.B.B.S. Regespal R. Recht, D.D.S. M.B.B.S. Fwald M. Beardchress, Ph.D. Rayerichts Prisod, B.D.S. M.D.S. Anne Mane Keingers Jogunan, D.D.S. Ph.D. Stetaan Berge, M.D. D.D.S. Ph.D. Household em Mangeler, Reference, Jones on America

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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, Gupid's bow, lip length, north symmetry, and appearance of alar dome and base.

Results: With regard to white roll, vermilion border, scar, Cupid's box, and lip length, the Afroze incision always gave superior results compared with the Millard or Pfeifer incision. Depending on the cucied for treatment success, the Afroze incision also showed better results regarding nostil 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. Bereast.* Sup: 125: 1208, 2010.)

The anatomical basis for a cleft lip (lefect is farpeared with the normal orientation. Composed with the non-left patient, the three groups of superficial factal innscless (i.e., the nasolabral, bilabral, and labiomental) are all displaced inferiodel. The orbit data on the cleft side and a partially distorted insertion on the cleft side and a partially distorted insertion on the cleft side and a partially distorted insertion on the cleft side and a partially distorted insertion on the cleft side and a partially distorted insertion on the cleft side and a partially distorted insertion on the cleft side and a partially distorted insertion on the cleft side and a partially distorted insertion on the cleft side and the skin roll on both sides are also distorted. The treatment goals for cleft lip defects are carly correction of the cleft, with primary correction to a tension-tice, mobile, and balanced lip.¹

The repair of any cleft hip deformity should take not just incision lines into a count, A funcnoial anatomical repair of the underlying hard

From the GSR Institute of Commissional Surgery, the Department of Preventing and Conditive Densistry, Hadhwald Conwerschy, Spragenge Mecked Z-school, A. R. Schett, Menneedu Dental College and Hospitaly, and the Department of Othsolentins and Oral Budger, Cleff Dalate Conventional Conmonst the Department of Oral and Measublicent Surgery, Radhmal University Nymagen Medical Center,

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positioning of the innercentations tassues must be addressed only once sound foundations have been laid. A primary surgical approach that allows ranural factal growth and development, minimizing the need for future secondary procedures, should be every cleft surgeon's goal.) Many surgical techniques and flap designs

and soft tissues is essential. Manipulation and re-

have been documented to repain unilateral eleft hps.¹⁰⁰ Probably the most commonly used is the rotation advancement rechnique described by Millard.¹¹¹² The Millard unision is based on a rotation flap on the noncleft side coupled with an advancement flappon the cheft side.¹¹² In one form or another, it is the most widely practiced method todae.³

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

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

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Construction of American Society of Marche Surgeones. Unexthemated reported the ULTA's actions to the

- 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 complete collapse 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 IN ALL UNILATERAL COMPLETE CLEFT LIPS

DEVIATED NASALSEPTUM



Is Primary Septoplasty necessary???



A fifteen 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



www.craniofacialinstitute.org

Septocheiloplasty: 15 years post operatively



www.craniofacialinstitute.org

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

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

Methoda: A prospective cohort study of 190 consecutive patients with complete unilateral cleft lip and alreadus with cleft palate treated with or without septoplany using the Afrone incluion rechnique was conducted at a high-volume center. Eighty-two patients operated on without primary septoplasty and 76 patients operated on with primary septoplasty were evaluated. Nasal symmetry sas compared between patients using two-dimensional photographic analysis Batios between the cleft side and the non-cleft side for five parameters were used to assess symmetry: alar hase-to-interpupillary line distance, columella to-Cupid's how distance, nostril gap area, nostril width, and nostril height. The Mann-Whitney Utest was used to calculate differences between the two groups. Results: Patients operated on with primary septoplasty showed more pasal symmetry compared with patients operated on without septoplasy. This differ ence was statistically significant for columnila-to-Cupid's bow distance, nowril gap area, and monthl beight (p = 0.008, p < 0.001, and p < 0.001, respectively) and for the dataace bottoern alar hase and the alar hase-to-interpupillary line distance (# = 0.145) the difference was present but not nationally significant.

For nostril width, no difference was found (p = 0.850). Conclusion: Patients treated with primary septoplasty showed better results in terms of naul symmetry when analyzed using two-dimensional photographic analyses. (Plant Reconstr. Surg. 127: 761, 2011.)

lip deformine?

expite a multiplicity of sorgical approaches to its correction and as much variation in treatment philosophy, the deft lip pasal deformity remains a formidable challenge to the reconstructive surgeon treating patients with these congenital deformities. Historically, correction of the cleft now deformity had been delayed until maal growth was complete.1 Early surgical intervention was thought to interfere with normal growth, leading to poor long-term results.1 Patients with cleft now deformity had to tolerate the physical masal deformity and the

From the GSR Institute of Craninfuerial Surgery, Brogen Claft and Croninfucial Center; Departments of Carningy and Precentice Destistry, Orthodousics and Orol Biology and Head Cleft Pulate Crawiefscial Unit, and Onit and Humilipicial Stargery, Radhoud University Nijrogen Malicul Center; and A. B. Shetty Menurial Denial College and Hospital. Bearing for publication July 8, 2010; accepted August 26, 2010

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growth with primary correction of the nose deformity along with the correction of the cleft lip. Newenheless, controversy remains regarding the best time to attempt primary surgical correction of uni-lateral cieft lip name deforming.¹⁻¹ Although a grow-

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

> > 761

psychological teauma well into their adolescence.¹

Randall noted that these patients often were more concerned with their massl deformity than with their

Refinement of thinoplasty sechniques has facil-

itated the ability to address the deformity associated with cleft lip.2 McComb? and Andert? have published

long-term studies that show very little impact on

ing number of centers perform the naial repair in

roujunction with cleft lip surgery, some choose a

secondary rhinoplasty at a later stage, when the car-

www.PRSjournal.com

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

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www.craniofacialinstitute.org

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



Vertical Nostril Length





Gaussian Distribution

Mean Symmetry ratio of 1.25

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

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

of approximately the same age and sex. Primary septoplasty was performed in confunction with the cleft lip (CL) repair using the Afrosc initian, 3D facial images were equired using 3D sterosphotogrammetry. After a 3D cephalometric analysis of the lip and mose was performed in both groups, linear and volumetric data were acquired. Lip and nose symmetry were calculated and compared using Statedit's strests as well as the CL in square test. Remark: 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 chelloseptoplasty according to the Afroze technique in patients with CUCLP, asymmetry in the nose and I/p areas 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 sterophotogrammetry, 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 exterici and functional results. However, the management of CUCLP deformities, especially that of the nose, remains a challenge.

Footnote: #Both authors contributed equally to the study *Received for publication: May 2, 2011; accepted; August 21, 2011 results of different operative procedures to correct the CUCLP nose deformity. However, quantification of rhinoplastic procedures remains difficult. Besides direct anthropometric measurements σ_s studies comparing pre- and postoperative nose and lip changes in patients with clefts are limited to two dimension-

Various studies 10-40 have been undertaken to evaluate the

DOI:10.4193/Rhino.11.092

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

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 and PERIOPLASTY

Bring the Smile Back



