16. Cleft Rhinoplasty

Alex Campbell, MD and Carolina Restrepo, MD

DEFINITIVE RHINOPLASTY FOR ADULT CLEFT LIP NASAL DEFORMITY

- Rhinoplasty remains one of the most challenging procedures in plastic surgery and patients with a cleft lip nose deformity are some of the most challenging rhinoplasty patients.
- Cleft nasal deformity is a three-dimensional abnormality involving all layers of the nose: skeletal platform, vestibular lining, cartilaginous structure, and external nasal skin.
- The goals of septorhinoplasty are to maximize functional nasal breathing and to optimize nasal and facial appearance.
- At adolescence the nasal bones, upper lateral cartilages (ULC), and septum begin to rapidly expand anteriorly and vertically.
- Proper timing for definitive cleft rhinoplasty is after the adolescence period has passed and nasal growth is complete (age 14 in females and 16 in males).
- Open rhinoplasty after the nose has reached adult proportions allows reconstruction of catrilagenous architecture with cartilage grafts.
- This often requires grafts from the nasal septum (strong hyaline cartilage but short supply), conchae of the ears (relatively weak), or costal cartilages (choice for larger reconstructions requiring strong anterior projection).
- In most cases, the skeletal foundation, both dental and craniofacial, should be stabilized before performing definitive nasal surgery.

PHYSICAL EXAMINATION

- Evaluate entire face from the forehead and to the mid and lower face.
- Lip symmetry and the height of the lip on both halves should be measured. Definition and symmetry of the mucocutaneous junction of the lip is important. The red lip should be evaluated for its

volume and symmetry on both the front and profile views.

- Midface examined for midface hypoplasia, common in cleft patients.
- Oral cavity is evaluated for alveolar cleft. Bone deficiency in the paranasal region plays an important role in a successful cleft lip rhinoplasty. Occlusal abnormalities and the number of missing teeth are assessed and recorded.
- Lower face is observed for chin disharmony.
- Profile alignment and the position of the chin are then noted.
- Nose examined in detail after assessment of the entire face.
    - Skin checked for thickness.
    - Nasal bones examined for symmetry, length, and size.
    - Middle vault is observed for upper lateral cartilage collapse and vertical symmetry.
    - Shape of the nasal tip is defined as being bulbous, boxy, or narrow and examined for asymmetry or fullness.
    - Alar base width is observed along with vertical position of ala and of symmetry of nasal sill on both sides.
    - On the profile view, the depth of the radix, presence or absence of a dorsal hump, tip projection, and nasolabial angle.
    - On basilar view the position of the nasal tip is noted along with the infratip lobule size and symmetry, shape and symmetry of the nostril length, direction of the columella, shape of the ala, and the position and symmetry of the nostril sill.
    - Internal nose examination should include observation of stenosis of the internal and external valves, presence of a deviated septum, size and shape of turbinates, presence of synechiae or septal perforation. Cottle maneuver tests internal valve.

Unilateral Cleft Lip Nose Deformity:

1. The columella is shorter on the cleft side.
2. The base of the columella is deviated to the noncleft side.
3. The lateral crus of the lower lateral cartilage is longer on the cleft side.
4. The nasal tip is displaced in both frontal and horizontal planes.
5. The nasal tip is asymmetric.

6. The ala is flattened, resulting in horizontal orientation of the nostril.
7. The nostrils are asymmetric.
8. The base of the ala is displaced laterally, posteriorly and inferiorly.
9. The nasal floor is caudal on the cleft side.
10. The cleft side nasal floor is sometimes deficient with nasolabial fistula.
11. The septum and anterior nasal spine are shifted toward noncleft side.
12. The nasal septum is deviated, often resulting in nasal obstruction.
13. The inferior turbinate on the cleft side is hypertrophic.
14. The maxilla is deficient on the cleft side.
15. The premaxilla and the maxillary segments are displaced.

Bilateral Cleft Lip Nose Deformity:

1. The columella is short and prolabium seems attached to the nasal tip.
2. The nasal tip is flat, broad, and depressed. Nostrils are wide with margins buckling inward
3. The nasal alae are flat and both nostrils are wide with buckled margins.
4. The bases of the ala are displaced laterally, posteriorly and inferiorly.
5. The lower lateral cartilages are severely deformed.
6. The nasal floor is sometimes deficient with nasolabial fistula.
7. The caudal cartilaginous septum and the nasal spine are displaced inferiorly relative to the level of the alar bases.
8. The nasal tip and the nostrils are commonly asymmetric.

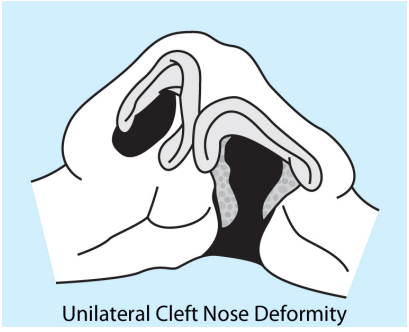


Figure 16-1. Unilateral cleft nose deformity. © 2017 A Campbell, C Restrepo

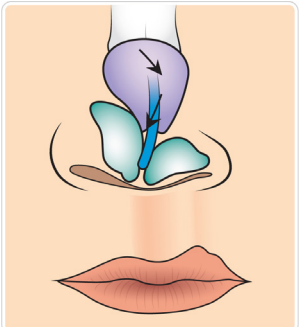


Figure 16-2. UCL nose deformity. © 2017 A Campbell, C Res-

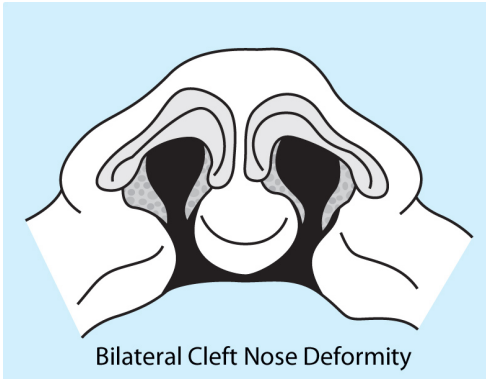


Figure 16-3. Bilateral cleft nose deformity. © 2017 A Campbell, C Restrepo

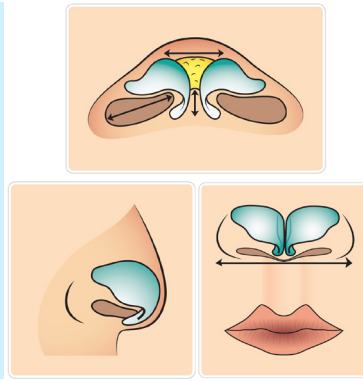


Figure 16-4. BCL nose deformity. © 2017 A Campbell, C Restrepo

RHINOPLASTY ANALYSIS

- Proper selection of maneuvers and technique for rhinoplasty is dependent on a rigorous analysis to properly identify the specific anatomic deformities involved. A systematic analysis depends on evaluation of the frontal, lateral, and basal views.

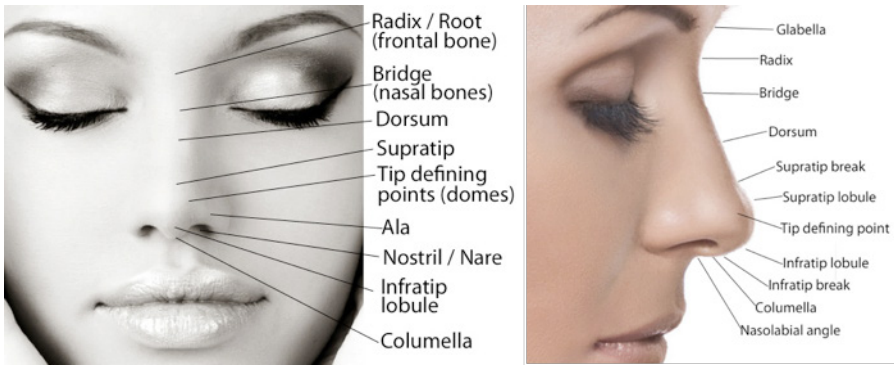


Figure 16-5. Surface anatomy of the nose. © 2017 A Campbell, C Restrepo

Rhinoplasty Analysis

Profile	Frontal	Basal
Radix	Straightness	Dorsal Line
Dorsal Height	Bony-Cartilaginous	Tip Definition
Tip Projection	Tip Bulbousness	Nostril Symmetry
Tip Rotation	Tip Definition	Alar Base Width
Alar Columellar Relation	Alar-Columellar Relation	
Naso Labial Angle		
Caudal Septum		
Chin Projection		

Table 16-1. Elements of systemized rhinoplasty analysis.

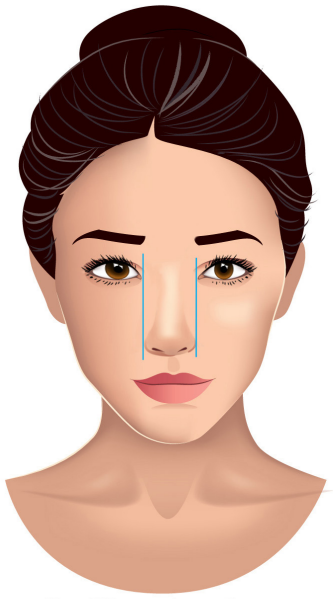


Figure 16-6. Alar width. © 2017 A Campbell, C Restrepo

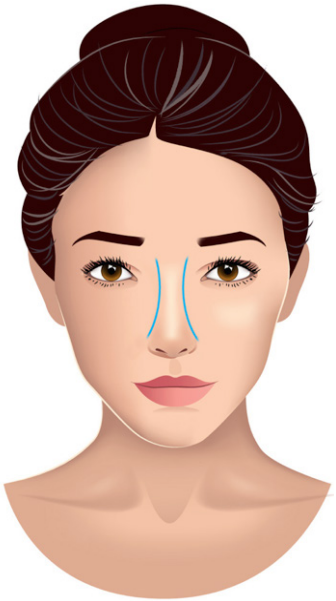


Figure 16-7. Dorsal aesthetic lines. © 2017 A Campbell, C Restrepo

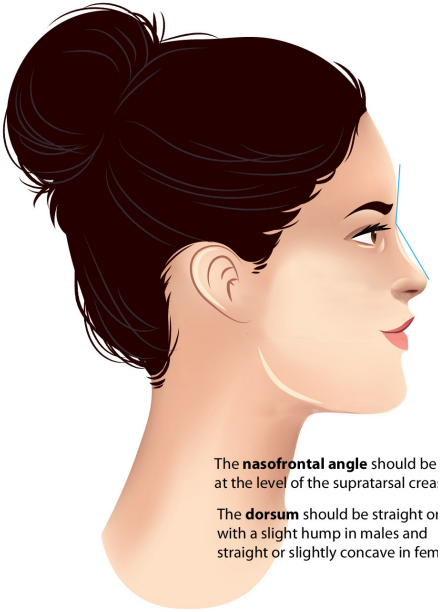


Figure 16-8. Dorsum and nasofrontal angle. © 2017 A Campbell, C Restrepo

Figure 16-9. Nasal length and tip projection. © 2017 A Campbell, C Restrepo

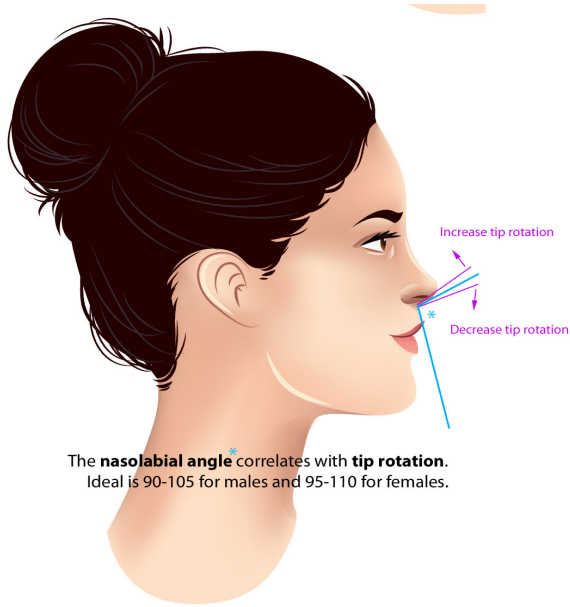


Figure 16-10. Nasolabial angle and tip rotation. © 2017 A Campbell, C Restrepo

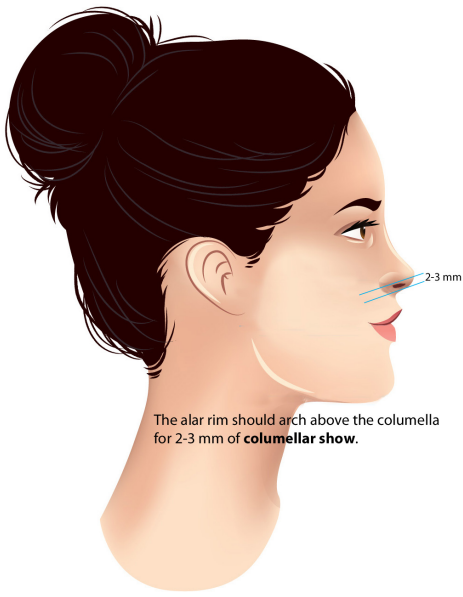


Figure 16-11. Columellar show. © 2017 A Campbell, C Restrepo

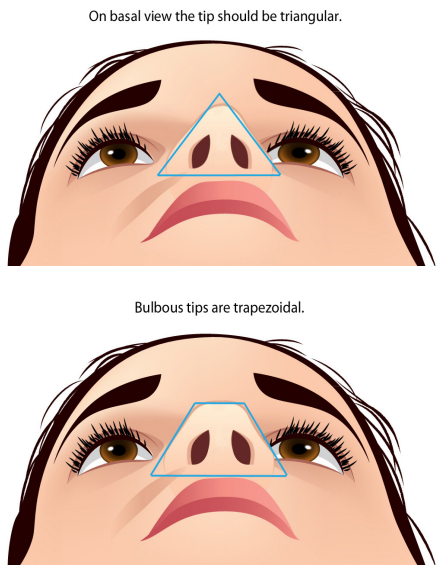


Figure 16-12. Tip analysis basal view. © 2017 A Campbell, C Restrepo

ANESTHESIA

- General anesthesia is preferred for the majority of patients who undergo comprehensive septoplasty and cleft lip rhinoplasty to provide a safe airway, reduce the potential for surgeon distraction, and ensure airway patency.
- The anesthetization sequence is begun by placing pledgets soaked in oxymetazoline and lidocaine in the nose, especially up underneath the nasal bones.
- Injecting the local anesthetic (1 % lidocaine with 1:100,000 epinephrine) into the nose prior to prepping and draping allows time for vasoconstriction.
    - An infraorbital nerve block is performed with bupivacaine through a vestibular puncture.
    - Anesthetic is injected into the side wall of the nose through an infrarcartilaginous puncture; to prevent distortion, only a minimal amount is used.
    - Slight ballooning (2 mm) of the dorsum through a septal angle puncture imitates the permanent soft tissue thickening to be expected and facilitates accurate hump removal.
    - The tip is injected using infracartilagenous punctures.
    - The septum is systematically injected back to front and the inferior turbinate is injected if part of the operative plan

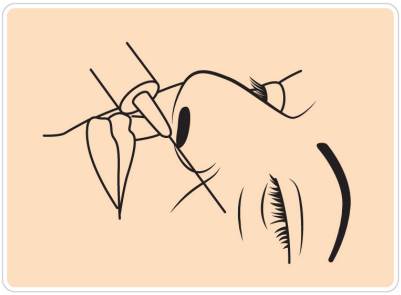


Figure 16-13. Infraorbital nerve block. © 2017 A Campbell, C Restrepo

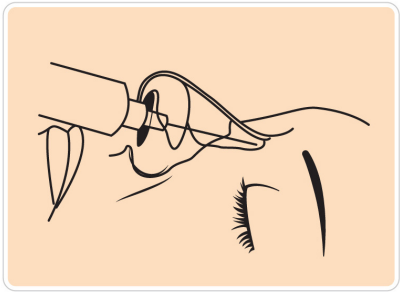


Figure 16-14. Injection of dorsum. © 2017 A Campbell, C Restrepo

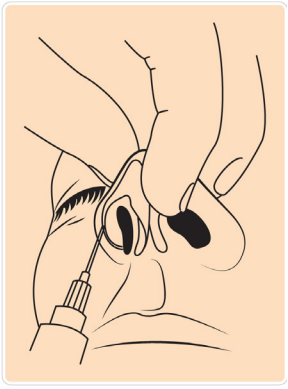


Figure 16-15. Injection of infracartilagenous incisions and tip. © 2017 A Campbell, C Restrepo

- Anesthesia and hemostasis are maintained for as long as necessary by reinjection every 60 minutes.
- The entire face and one ear are prepared and draped to allow evaluation of facial balance and ready access to auricular cartilage. An Oral Rae ® endotracheal tube is secured in the midline without distorting the mouth.

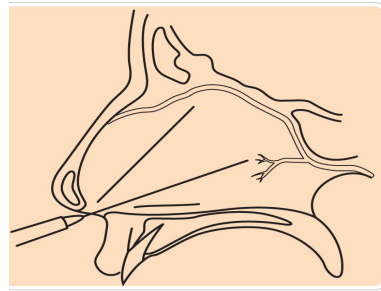


Figure 16-16. Injection of septum. © 2017 A Campbell, C Restrepo

SURGICAL PLANNING

- One of the most important aspects of cleft lip rhinoplasty is the creation of a symmetric and ideally positioned alae, without which the outcome of rhinoplasty, no matter how well it is done, will not be optimal.
- If orthognathic surgery, bone graft to the alveolar cleft site, or maxillary augmentation is planned, it should be completed first.
- Systematic reorientation of distorted nasal architecture, especially the lower lateral cartilages, and creation of a balanced platform for the lower lateral cartilages constitute some of the cardinal principles for correcting the cleft lip nose deformities.
- Write out a step-by-step operative plan, from anesthesia to dressing, and post it in the operating room to simplify your surgery. As you write out each step you are forced to decide whether to do that step and more importantly how to do it. By asking and answering as many questions as possible preoperatively, one has a greater sense of clarity and certainty in the operating room.
- The nature of the operation varies tremendously from patient to patient. A generalized outline of possible techniques is summarized.

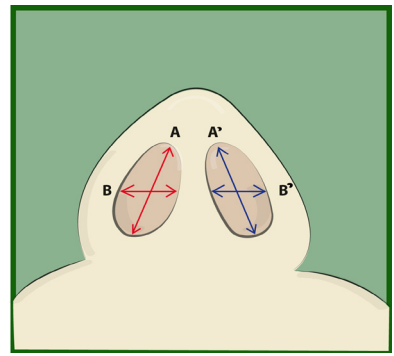


Figure 16-17. Symmetric alae in vertical and horizontal dimensions. © 2017 A Campbell, C Restrepo

Rhinoplasty Operative Sequence
1. Essentials - 2.5x loupes, fiberoptic headlight, own instruments
2. Anesthesia - General with appropiate monitors
3. Local injection followed by preparation - wait 10-15 min
4. Remove intranasal nasal pack and shave vibrissae
5. Open approach using infralobular and transcolumellar incisions
6. Elevation of skin envelope
7. Septal exposurevia transfixion incision and extramucosal tunnel
8. Reasses operative plan based on alar and septal anatomy
9. Creation of symmetrical alar rim strips
10. Incremental hump reduction - rasp:bone, scissors: cartilage
11. Caudal septumANS excision (Optional)
12. Septal harvest/septoplasty
13. Osteotomies
14. Graft preparation
15. Spreader grafts (Optional)
16. Columellar strut and suture
17. Tip sutures with optional add-on grafts (excised alar cartilage)
18. Closure
19. Alar base modification (optional)
20. Alar rim grafts (ARS) (optional)
21. Doyle splints, external cast, and nasal block

Table 16-2. General rhinoplasty operative sequence.

INCISION AND EXPOSURE

- The majority of the cleft lip related nasal deformities are more successfully corrected through an open technique.
- Skin hook traction is placed at the nostril apices and a transverse colume-

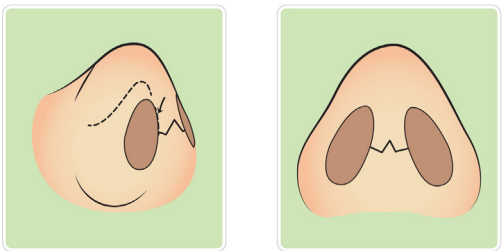


Figure 16-18. Incisions for open rhinoplasty . © 2017 A Campbell, C Restrepo

llar incision with central dentate flap placed between the anterior 1/3 and posterior 2/3 of the columella, at the narrowest point. A stair step incision lower on the cleft side can also be used.

- Incision extended superiorly 2.5 mm behind lateral edges of columella, continuing to infracartilagenous (rim) incisions.
- Columella incision deepened to the middle crura of the alar cartilages with fine scissors while protecting middle crura from injury.
- Paired septal (columellar) branches of the superior labial arteries identified and cauterized.

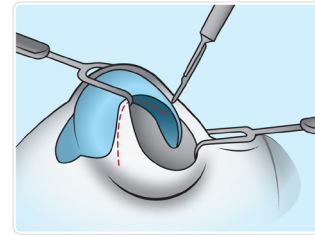


Figure 16-19. Transcolumellar and infracartilagenous incisions. © 2017 A Campbell, C Restrepo

- As flap of skin and fat elevated off the middle and lateral crura of the alar cartilage, the internal incision is extended across the nasal vestibule following the inferior edge of the lateral crus of the alar cartilage.
- Alar cartilage visualised as flap elevated and vestibular tissue cut at inferior edge of lateral crus of LLC, releasing skin of the nasal tip.
- Flap of skin and fat elevated off of perichondrium and periosteum of nasal cartilages and bones.

FREEING DEFORMED CARTILAGES

- Commonly, the dome on the affected side is posterior; the lateral crus extends laterally; and almost invariably, the medial crus is shorter than ideal, causing length deficiency in the columella.
- Extensive release of the deformed cleft sided LLC from its attachments to the maxilla is necessary in order to adequately reshape the cleft side ala.
- Cartilage and vestibular lining is released from the bone at the piriform aperature so that the nasal vestibule and alar margin can be projected anteriorly and also reshaped.

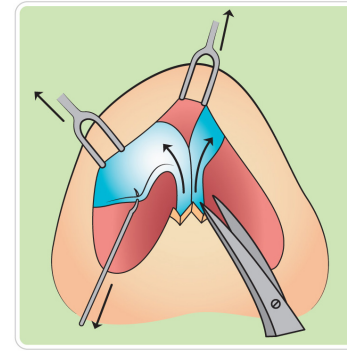


Figure 16-20. Elevation of skin flap. © 2017 A Campbell, C Restrepo

- The upper lateral cartilages are released from septum, trimmed, and repositioned as necessary.
- It is commonly necessary to completely free up the lower lateral cartilage and vestibular lining on the cleft side as a single unit and perform a V-Y chondromucosal flap advancement to restore alar contour and symmetric tip projection.

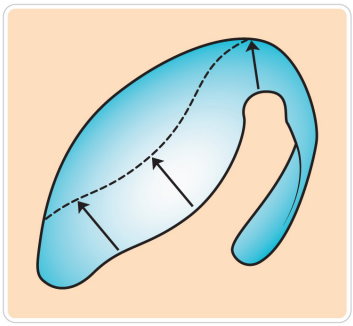


Figure 16-21. Cephalic trim of lower lateral cartilage.

- The lower lateral alar cartilages are carefully analyzed. A cephalic trim is often indicated and designed so as to leave behind symmetric cartilages of at least 7mm in width.

DORSUM, RADIX, AND NASAL BONES

- Many patients require removal of the cartilaginous and bony dorsal hump and reduction of the radix.

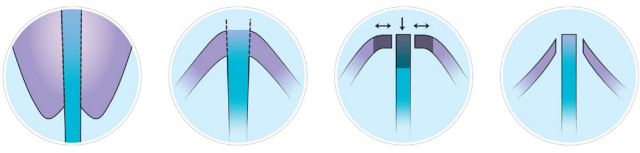


Figure 16-22. Release upper lateral cartilage from septum.

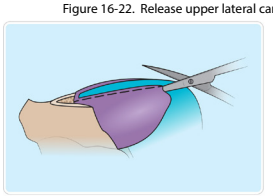


Figure 16-23.

Release of upper lateral cartilage from septum.

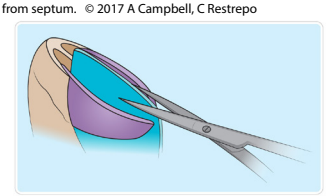


Figure 16-24.

Removad of dorsal cartilaginous septum with scissors.

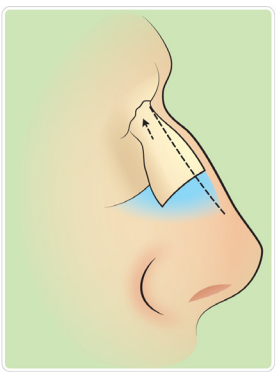


Figure 16-25.

Removal of dorsal hump cartilage and bone.

- The nasal bones are frequently widened both at the dorsum and at the frontal process of the maxilla and frequently there is some degree of asymmetry in the nasal bones. These patients require nasal bone osteotomies (medial oblique osteotomies plus lateral osteotomoes) with medial mobilization of nasal bones

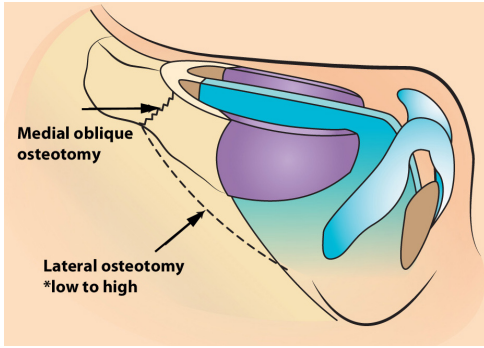


Figure 16-26. Medial and lateral bony osteotomies to narrow nasal bones and close open roof. © 2017 A Campbell, C Restrepo

SEPTUM

- Invariably, the septum is deviated in its midportion to the cleft side and caudally to the normal side.
- A septal deviation is most successfully corrected through an open dorsal approach during rhinoplasty, which provides a full view of the septum.
- The caudal septum exposed via a dorsal-tip split or through a hemi-transfixion incision.

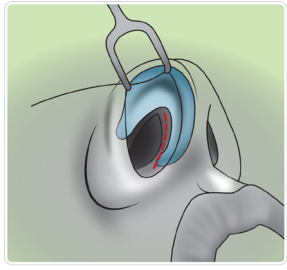


Figure 16-27. Hemitransfixion incision. © 2017 A Campbell, C Restrepo

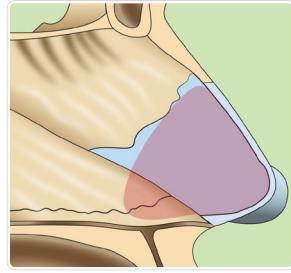


Figure 16-28. Dissection of septum. © 2017 A Campbell, C Restrepo

- The septoplasty should include resection of the posterior portion of the quadrangle cartilage, vomer bone, and perpendicular plate of the ethmoid bone, if deviated.
- Strong and straight dorsal and caudal L-shaped frame of 10 mm is left to support the nose.
- Deviated septum may be released from nasal spine and fixated in midline position.

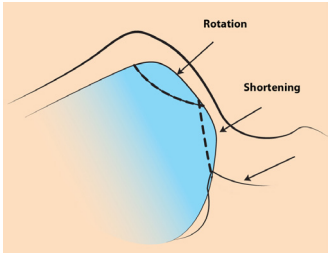


Figure 16-29. The caudal septum may be trimmed to rotate or shorten or the nose. © 2017 A Campbell, C Restrepo

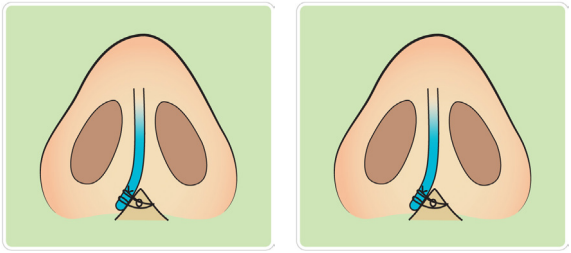


Figure 16-30. A deviated septum may be released from nasal spine and fixated in midline position.

© 2017 A Campbell, C Restrepo

SPREADER GRAFTS

- Spreader grafts function to straighten nasal dorsum, increase dorsum height, and open internal valve.
- Crooked septal cartilage compressed between spreader grafts to straighten septum on AP view, so septum in line with middle of upper lip.
- Most cleft lip noses benefit from spreader grafts following reduction of the dorsal hump and osteotomy.
- Typically designed from septal cartilage.
- 2.0 – 3.0 cm long, 4 mm deep, and 1.5 mm wide.
- Spreader grafts fixated to septum with 27 gauge hypodermic needles and the three layers (spreader-septum-spreader) are sutured tightly together with 5.0 monofilament mattress sutures.

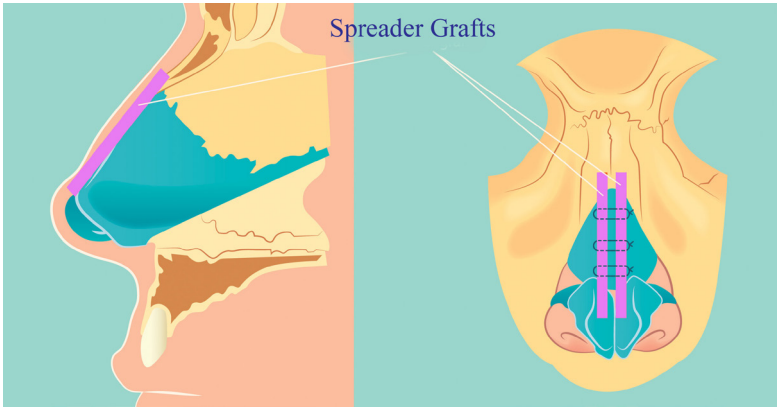


Figure 16-31. Spreader grafts (red) are placed between the upper lateral cartilage and septum on either side, symmetrically or asymmetrically according to need. © 2017 A Campbell, C Restrepo Campbell, C Restrepo

- It is essential to align the upper lateral cartilages with the dorsum and fix the upper lateral cartilages to the spreader graft and the anterior border of the septum. ULC's are anchored to the straighteneed midline septum with 5.0 monofila ment sutures passed through all 5 laters of cartilage.

COLUMELLAR STRUT GRAFT AND TIP FRAMEWORK

- The framework of the nasal tip is constructed to project 6-8mm above the dorsal line of the septal cartilage. Adequate nasal tip form and projection requires strong alar cartilages and tip support.
- A columellar strut is the most efficacious means of supporting the tip by bracing the alar cartilages and holding the nasal skin envelope in its normal dimensions and shape. A columellar strut of cartilage (or bone), as well as lateral crural grafts, form a tripod that resists the deforming force and deprojection after surgery.
- Use of a columella strut will increase the tip projection; elongate the columella on the cleft side; augment the subnasale, which is often deficient; increase the nasolabial angle; and prevent the tip from shifting caudally.
- A **"floating" columellar strut** is inserted into a pocket that extends deep to the feet of the medial crura and fixated in position with a transmucosal gut suture in order to fix the height and sym-

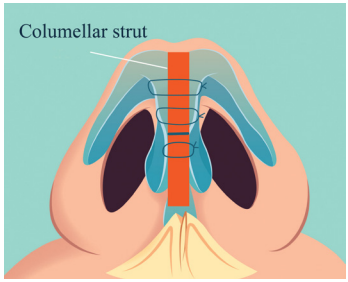


Figure 16-32. Columellar strut (red) sutured between medial crura. © 2017 A Campbell, C Restrepo

Fixed columellar strut

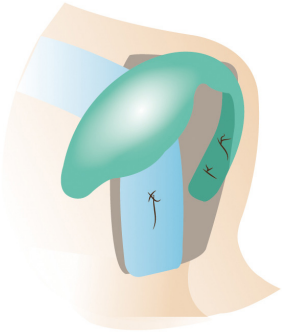


Figure 16-33. Columellar strut (gray) may be fixed to the septum. © 2017 A Campbell, C Restrepo

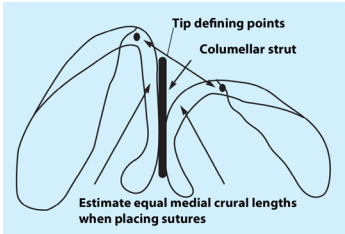


Figure 16-34. Lower lateral cartilages on cleft side and noncleft side are assembled onto the columellar strut to achieve symmetry. © 2017 A Campbell, C Restrepo

metry of the alar cartilage arches.

- Alternatively a **"fixed" septocolumellar strut** is fixated to the caudal septum with monofilament sutures to set tip position, rotation, and projection. This graft links the caudal septum and tip providing support and preventing secondary distortion. These grafts are often massive (25 mm x 20 mm) which achieves both lengthening and projection.
- The medial crura are then fixated to the columella strut with monofilament sutures and the footplates are approximated to narrow the columella base.
- This also elongates the nostril, creates fullness of the subnasale, and increases stability of the central limb of the nasal base tripod.
- The strut is then sutured to the cephaic edges of the LLC medial and middle crura with several 5.0 monofilament sutures, giving the nose a stiff, strongly supported tip structure.
- Intradomal, transdomal, and lateral crura sutures are placed as needed.

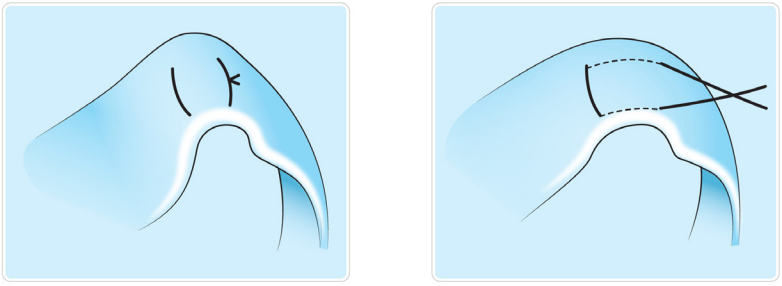


Figure 16-35. Intradomal suture to increase tip definition. © 2017 A Campbell, C Restrepo

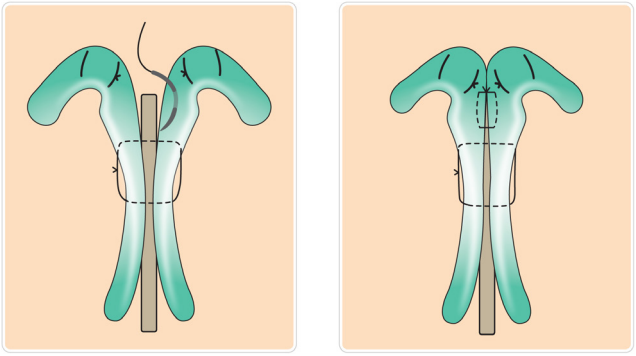


Figure 16-36. Interdomal suture to decrease tip width. © 2017 A Campbell, C Restrepo

DEFINITION AND TIP GRAFTS

Tip Maneuvers

Reduce bulbous tip	Cephalic trim lateral crura
Increase tip projection	Columellar strut
Improve tip definition	Domal creation sutures
Dcrease tip width	Interdomal sutures
Tip position	Tip position sutures
Asymmetry	Domal equilization sutures
Extra tip projection / definition	Tip grafts

Table 16-3. Surgical maneuvers for the tip.

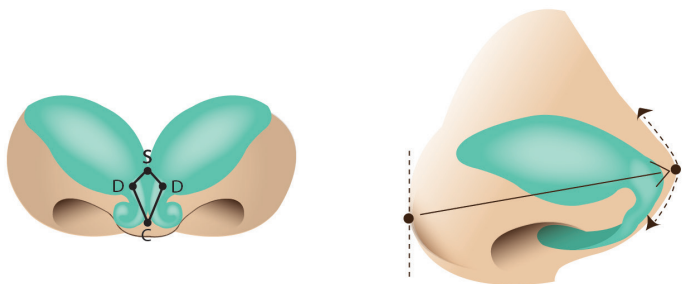


FIgure 16-37. Elements for consideration of the nasal tip. © 2017 A Campbell, C Restrepo

- A **shield graft** may be placed caudal to the medial crura and extending anteriorly to project beyond the domes. The graft is used to provide tip support, projection, definition, and fullness caudal to the medial crura to aid in shaping the columella. Dimensions 12-16 mm long and 9-11 mm across the top, carved with edges smoothed. It is stabilized by suturing it in place to the crura. The anterior end of the graft is rounded and shaved extremely thin to prevent visibility.

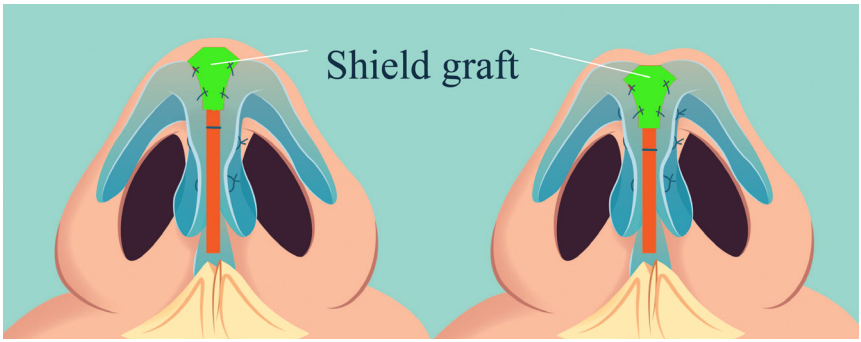


FIgure 16-38. A shield graft (green) can be projecting and visible (A), or nonprojecting and invisible (B). © 2017 A Campbell, C Restrepo

- An **onlay tip graft** (5-7 mm high and 9-11 mm wide), or **cap graft**, is a single or multilayered graft sutured horizontally over the alar domes to minimally increase tip projection but mainly to camouflage tip irregularities. The edges of the graft must be beveled or crushed to avoid postoperative visibility. The nasal tip graft should project 6-8 mm above the dorsal line of the nasal cartilages, greater with thick supratip fatty tissue and less with thin supratip fatty tissue.

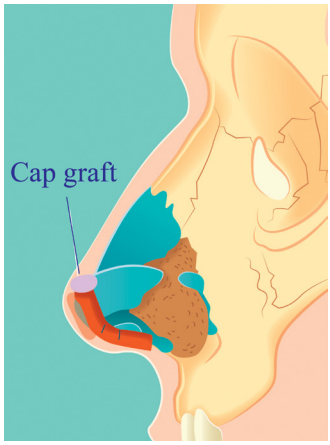


FIgure 16-39. A cap graft (violet) on the nasal tip.

© 2017 A Campbell, C Restrepo

GRAFTS OF THE ALAR REGION

- **Alar batten grafts** are nonanatomic grafts placed in a pocket extending from the piriform aperture to a paramedian position in the alar sidewall at the site of maximal lateral nasal wall collapse during inspiration.
- **Alar margin grafts (alar rim grafts)** are used to correct or prevent alar retraction or collapse. Dimensions 2-3 mm wide and 10-12 mm long. These grafts are placed in a subcutaneous pocket immediately above and parallel to the alar rim and must span the length of the alar deformity. The more severe the problem, the longer and wider the graft.

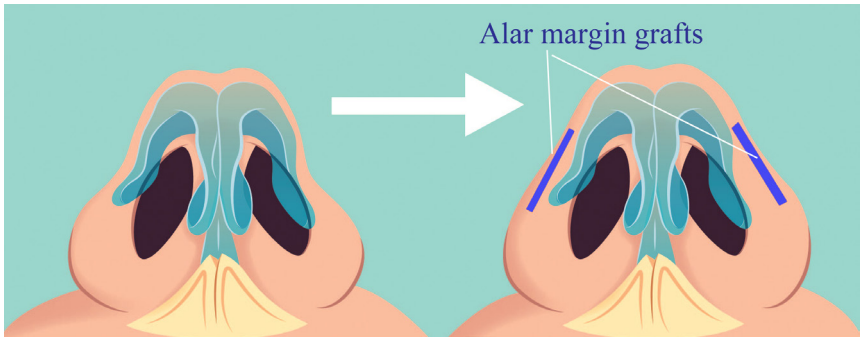


FIgure 16-40. Collapsed or deformed alar cartilages can be splinted with alar margin grafts (blue).

- **Lateral crural onlay grafts** (4-5 mm wide, 1-2 cm long) are used to correct alar contour irregularities caused by a deformed, intact lateral crus. The graft is placed over the existing lateral crus as an onlay graft and used to strengthen and shape the ala. By fastening the graft snugly to the lateral crus with 5.0 mattress sutures, the lateral crus can be straightened and strengthened. Bevel edges to avoid a visible "step-off" at the anterior end and cephalic margin of the graft.

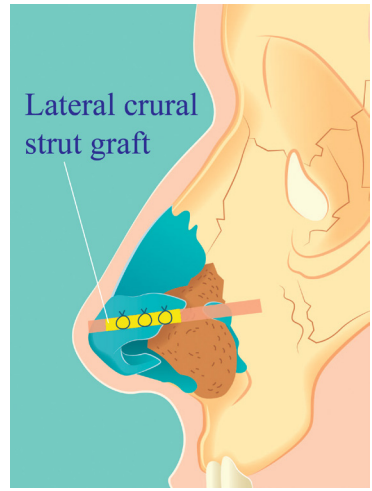


Figure 16-41. Lateral crural strut grafts (yellow) are placed deep to the lateral crus, extending lateral to the piriform aperature. © 2017 A Campbell, C Restrepo

- The **lateral crural strut graft** is a graft placed in an undermined pocket between the undersurface of the lateral crus and the vestibular skin and stabilized by suturing it to the crus. It is used to correct alar retraction, alar rim collapse, and concave, convex, or malpositioned lateral crura. The lateral end of the graft is usually placed superficial to the piriform aperture rim to avoid medial displacement of the graft. It can be extended laterally to rest on the bony edge of the piriform aperature to stabilize the lateral crus against postoperative deforming forces.

DORSAL ONLAY GRAFTS AND RADIX GRAFTS

- A **dorsal onlay graft** is a longitudinal graft used to augment and elevate the nasal dorsum and is made from septal cartilage, costal cartilage, or diced cartilage wrapped in temporal fascia (2.7 – 3.5 cm in length and 5mm in width). The graft is best used to span the entire length of the dorsum from the radix to the septal angle to avoid visible "step-off" deformities. Internal stabilization is achieved by suture fixation to the underlying framework.
- A **radix graft** is a single or layered dorsal graft placed in a tight pocket created over the radix. Radix grafts are used to augment an inadequate nasofrontal angle or to redefine the breakpoint further cephalad, which causes an apparent lengthening of the nose. The graft's shape and thickness will depend on the amount of augmentation desired. The edges should be crushed or carefully beveled to avoid visibility.

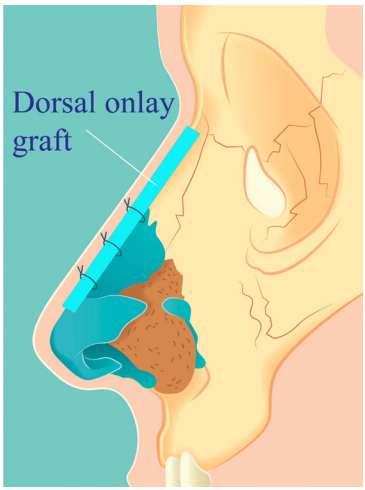


Figure 16-42. Dorsal onlay graft (light blue).

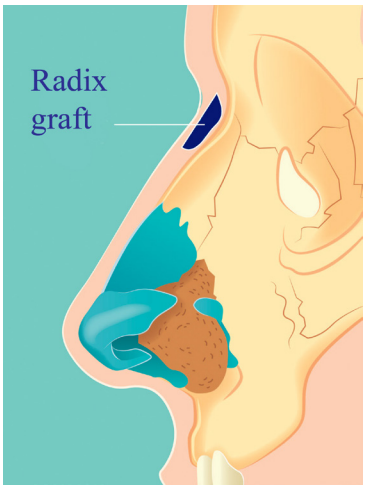


Figure 16-43. Radix graft (blue).

ALAR BASE GRAFTS AND PREMAXILLARY GRAFTS

- An **alar base graft** is a graft placed along the lateral piriform aperture to augment a recessed lip-alar base junction. Piriform augmentation can be performed with bone or alloplastic implants.
- A **premaxillary graft** is carved from cartilage or alloplastic implant

material (2.5 cm long, 10 mm high, and 7-8 mm deep) and placed along the caudal border of the piriform aperture to correct premaxillary recession. This advances the nasal base anteriorly and opens an acute lip – nose angle. Graft is placed through incision in floor of nasal vestibule just posterior to the nostril sill and is placed in a carefully dissected pocket between the floor of the nose and the gingivolabial sulcus inferiorly.

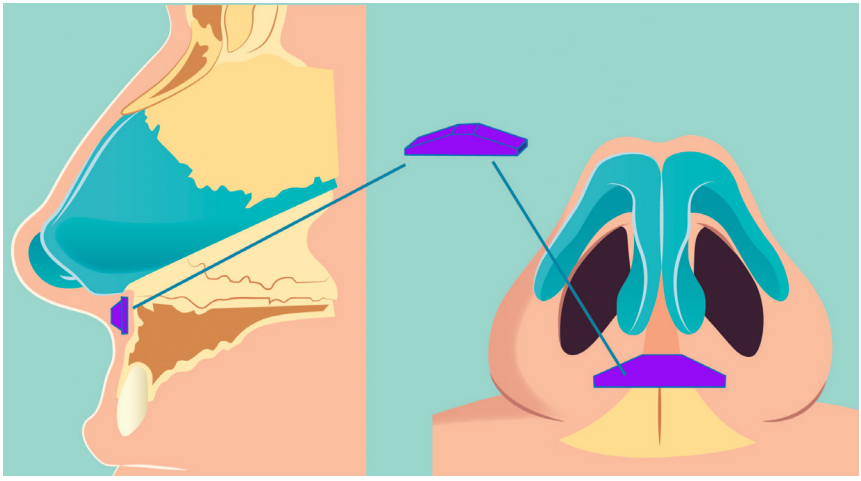
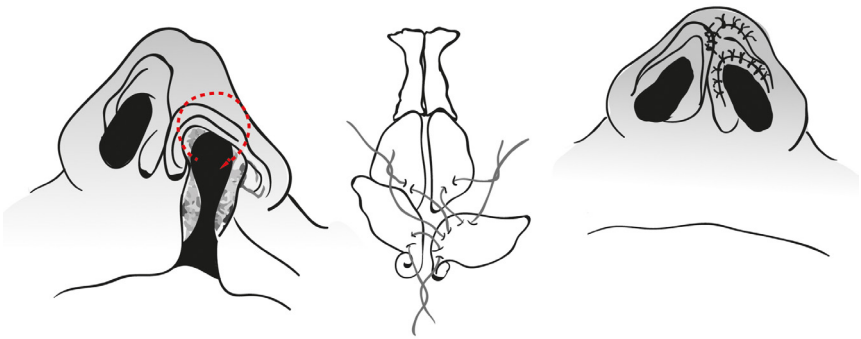


Figure 16-44. Premaxillary graft (purple) to correct premaxillary recession. © 2017 A Campbell, C Restrepo

ADDITIONAL MANEUVERS

- The **Tajima's inverted "U" technique** uses a reverse U-shaped incision that begins intranasally at the junction of the columella and membranous septum, passes onto nostril skin in the region of the dome, and then back intranasally toward the web formed by the lower lateral cartilage laterally. A rim incision on the opposite nostril allows for easier undermining and placement of intercartilaginous sutures. The skin is undermined widely over the lower two-thirds of the nose and sutures are placed between the cleft side lower lateral cartilage to the opposite lower lateral cartilage and upper lateral cartilages. The incision is then closed without skin resection.



Tajima technique

Figure 16-45. Tajima's inverted "U" technique uses a reverse U–shaped with repositioning of alar cartilages and final closure without skin resection. Adapted from: Tajima S, Maruyama M. Reverse-U incision for secondary repair of cleft lip nose. Plast Reconstr Surg. 1977 Aug;60(2):256-61.

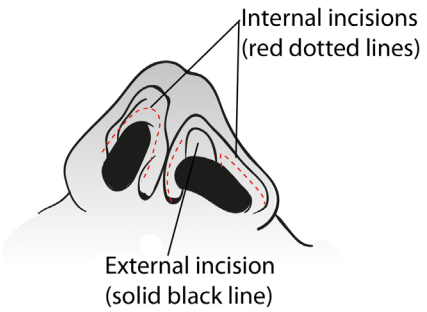


Figure 16-46. Tajima's inverted "U" incision begins intranasally at the junction of the columella and membranous septum, passes onto nostril skin in the region of the dome, and then back intranasally toward the web formed by the lower lateral cartilage laterally. Adapted from: Tajima S, Maruyama M. Reverse-U incision for secondary repair of cleft lip nose. Plast Reconstr Surg. 1977 Aug;60(2):256-61.

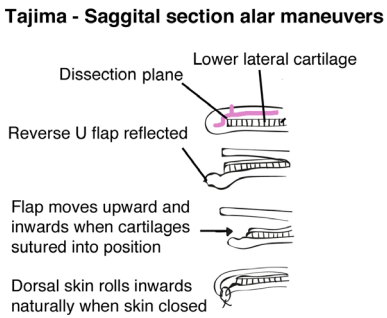


Figure 16-47 Tajima technique – saggital section of alar maneuvers. Adapted from: Tajima S, Maruyama M. Reverse-U incision for secondary repair of cleft lip nose. Plast Reconstr Surg. 1977 Aug;60(2):256-61.

- The **Dibbell rhinoplasty** consists of a bipedicled composite flap of lower lateral cartilage, mucosa, and nostril floor which is advanced to correct an inferiorly and medially rotated lower lateral cartilage, shortened columella, and lateralized alar base. The medial lip incision is continued superiorly along the columella, across the dome, and then laterally as a rim incision. The nostril is freed by an incision made around the base and continued medially. The entire nostril is rotated medially and superiorly.

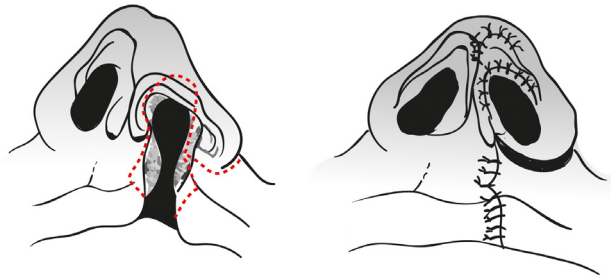


Figure 16-48. The Dibbell rhinoplasty ferrs and rotates the entire nostril medially and superiorly. Adapted from Dibbell D. Cleft lip nasal reconstruction: Correcting the classic unilateral defect. Plast Reconstr Surg. Feb 1982;69:264–271. 1982;69:264–271.

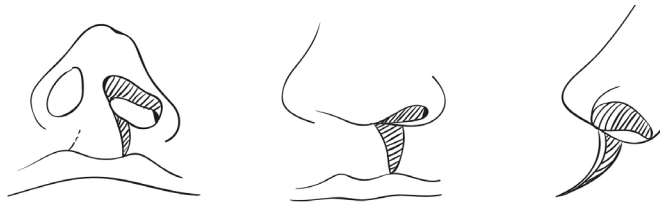


Figure 16-49. Dibbell procedure design. Shaded areas demonstrate excised skin. Adapted from Dibbell D. Cleft lip nasal reconstruction: Correcting the classic unilateral defect. Plast Reconstr Surg. Feb 1982;69:264–271. 1982;69:264–271.

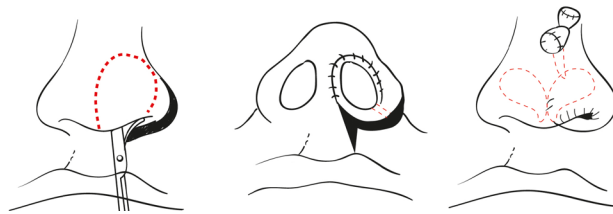


Figure 16-50. Dibbell procedure undermining (A), rotation of ala (B), and fixation (C). Adapted from Dibbell D. Cleft lip nasal reconstruction: Correcting the classic unilateral defect. Plast Reconstr Surg. Feb 1982;69:264–271. 1982;69:264–271.

- Cutting described a technique combining an open rhinoplasty with the Dibbell and Tajima techniques.

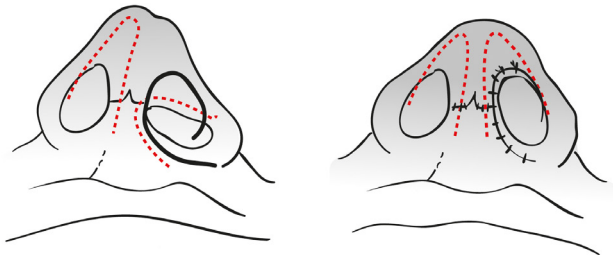


Figure 16-51. Cutting combined the Dibbell and Tajima tehniques during open rhinoplasty. Adapted from Flores R, Sailon A, Cutting C. A novel cleft rhinoplasty procedure combining an open rhinoplasty with the Dibbell and Tajima techniques: a 10-year review. Plast Reconstr Surg. 2009 Dec;124(6):2041-7. doi: 10.1097/PRS.0b013e3181bcf100.

- Potter V-Y chondromucosal advancement flap releases and improves position of alar cartilage (LLC) for improved symmetry.

Figure 16-52. Potter V-Y chondromucosal advancement flap open rhinoplasty. © 2017 A Campbell, C Restrepo

- During primary cleft lip surgery and revision cleft lip procedures using a Mohler design, advancement of the C-flap is a powerful technique to lengthen the hemi columella, suppot the soft triangle, and create roundness at the soft triangle.
- Alar bases narrowing is performed when needed using a diamond excision in the nasal sill centered over the previous incision for cleft lip repair. With this access a muscular roll of nasalis muscle may also be released at level of alar crease and sutured to nasal septum to support nasal sill, fixate septum in midline, and further define the alar crease.

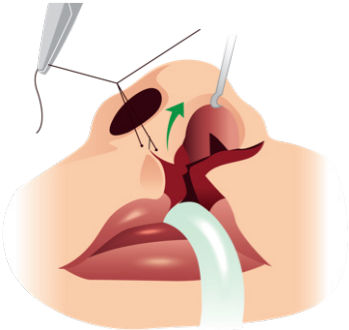


Figure 16-53. Advancement of C-flap (Mohler design) to lengthen hemicolumella and to support and shape the soft triangle. © 2017 A Campbell, C Restrepo

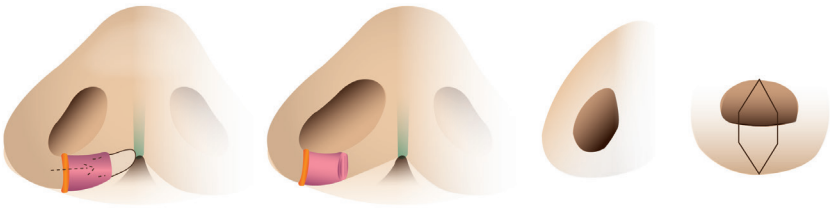


Figure 16-54. Alar base (nostril sill) narrowing. © 2017 A Campbell, C Restrepo

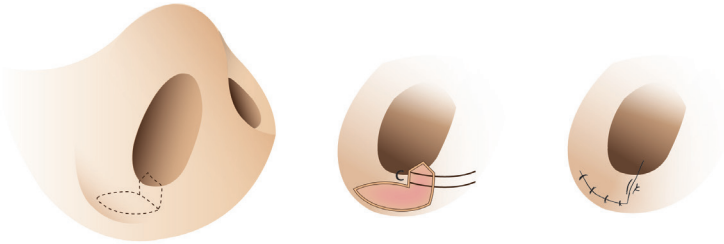


Figure 16-55. Alar base (nostril sill) narrowing with alar rotation. © 2017 A Campbell, C Restrepo

- Reduction of the turbinates, especially on the side contralateral to the deviation of the septum, provides improvement in the nasal airway.

SURGICAL DRESSINGS AND POSTOPERATIVE CARE

- At the completion of the case the columellar incision is repaired meticulously with 6.0 monofilament sutures.
- Postoperatively the septum is splinted using either a pair of Doyle stents or custom fabricated (intraoperatively) splints. These stents are sutured in position using transseptal nonabsorbable sutures.
- An external nasal splint is applied for 7 to 8 days to protect mobilized nasal bones in their new position.

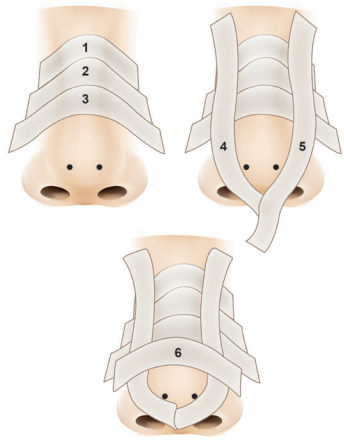


Figure 16-56. Post rhinoplasty taping to shape and support the nose and minimize edema. © 2017 A Campbell, C Restrepo

- External nasal taping holds the new nose structure in place to helps control healing. It should begin immediately after surgery and continue for 6 weeks, at least at night. The primary reason to tape the nose is to encourage the skin to shrink wrap down on to the underlying bone and cartilage. The pressure of the tape also presses out the swelling.

- Some patients tolerate taping very well for long periods, others can't. If a patient cannot tolerate taping, the signs are usually irritation from the tape. Stop taping if this case or try interrupting the process for several days until the irritation clears, then try again.
- Nostril retainer splints can be helpful to maintain nostril shape if worn at night for 3 months.

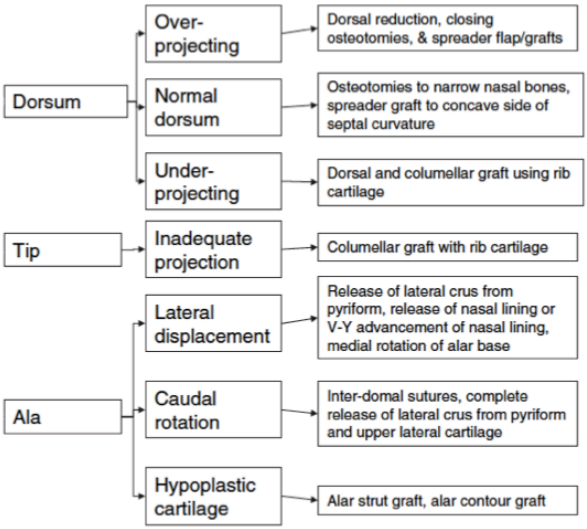


Figure 16-57. Common maneuvers in cleft rhinoplasty.

COMPLICATIONS AND OUTCOMES

- Overall, these are the patients who benefit from surgery tremendously and are usually grateful and very satisfied.
- Early postoperative complications could include infection, which can be minimized by perioperative use of antibiotics.
- Necrosis of the skin is extremely rare and, if it occurs, commonly associated with circulatory side effects of nicotine use.
- Because of the nature of the operation and the underlying condition, there is a higher chance of nasal obstruction preoperatively and sometimes postoperatively.
- Wound dehiscence is unlikely after a meticulous repair.
- The most common late complication of this operation is asymmetry. This can be at the nasal bones, nasal vault, tip of the nose, and,

most commonly, at the alar base and nostril.

- The inability to produce sufficient nasal tip projection or loss of tip projection because of scarring is another common late complication resulting in supratip deformity and suboptimal tip definition. The tip of the nose can become bulbous if the operation is performed at an early age.
- Septal deviation can also recur, or there could be some residual (uncorrected) septal deviation caused by the magnitude of the primary deformity. These should be documented at postoperative follow-up.
- A high percentage of patients with cleft nose deformity may require additional procedures.
- Documentation of the nature of subsequent surgery is crucial to aid in the assessment of the results to reduce the potential for revision.

KEY READING

1. Burget G. (2009) Definitive Rhinoplasty for Adult Cleft Lip Nasal Deformity. In: Losse J, Kirschner R: Comprehensive Cleft Care (pp. 499-524). McGraw-Hill Companies.
2. Stykes J, Jang Y. Cleft Lip Rhinoplasty. Facial Plastic Surgery Clinics of North America 17 (1): 133-144.
3. Guyuron B. MOC-PS(SM) CME article: late cleft lip nasal deformity. Plast Reconstr Surg. 2008 Apr;121(4 Suppl):1-11.
4. Staffel G. Bbasic Principles of Rhiniplasty. (1996) American Academy of Facial Plastic and Reconstructive Surgery.
5. Toruimi D, Beker D. Rhinoplasty Dissection Manuel (1999). Philadelphia: Lippincott Williams & Wilkins .
6. Howard B, Rohrich R. Understanding the nasal airway: principles and practice. Plast Reconstr Surg. 2002 Mar;109(3):1128-46; quiz 1145-6.
7. Gunter J. Landecker A, Cochran C. Frequently used grafts in rhinoplasty: nomenclature and analysis. Plast Reconstr Surg. 2006 Jul;118(1):14e-29e.
8. Daniel R. Mastering Rhinoplasty. (2010) Springer. Available at: http://books.google.com.co/books?id=Nvz4Zus0legC&pg=PA356&lpg=PA356&dq=mastering+rhinoplasty+reference&source=-bl&ots=HuqJrjnSD8&sig=6dZNcjc_0z0VSAas7YW4i8fvrio&hl=en&sa=X&ei=_kheUYLsNoXm9ASvno-D4BA&redir_esc=y#v=onepage&q=mastering%20rhinoplasty%20reference&f=false

Rhinoplasty Worksheet

Type
Primary
Secondary
Functional
Traumatic Deformity
Cleft lip-nose
Other:_____

Anesthesia:
☐ General ☐ Local

Approach
External (Open)
Closed
Other:_____

Septum:
Approach
☐ Hemi transfixation
☐ Top-down
Septoplasty
☐ Bone
☐ Cartilage
Quilting Suture
Other:_____

Dorsum:
Reduction Bone
☐ Rasp ☐ Osteotome
Reduction Cartilage
☐ Knife ☐ Scissors
Onlay graft:
_____
Altered N-F angle
Radix graft
Fascia graft
Fascia-diced cartilage graft
Other:_____

Upper Lateral Cartilages
Right: ☐ Divided
Left: ☐ Divided

Spreader grafts:
Right: _____mm wide
_____mm long
Left: _____mm wide
_____mm long
Other:_____

Tip- Lateral Crura
Cephalic Trim LLC
Right ____mm
Left____mm
Transected/Resected
☐ Anterior ☐ Posterior
Other:_____

Tip-Medial Crura
Resected
☐ Caudal margin
☐ Vertical segment
Other:_____

Tip-Miscellaneous
Columellar strut
___mm long ____mm wide
☐ Fixed ☐ Floating
Resected caudal septum
Alar base resection
Wier excistion alar rim
Suture techniques
☐ Medial crural
☐ Interdomal
☐ Transdomal
☐ Joined transdomal
☐ Intracrural septal
Other:_____

Tip Grafts
Shield
Onlay
Infralobular
Combination
Alar contour (rim)
Alar spreader grafts
Other:_____

Tip-Effect
Increased tip projection
Decreased tip projection
Increased tip rotation
Increased tip rotation
Lengthened nose
Altered columellar-alar relationship
Other:_____

Nasal Bones
Medial osteotomies
Lateral osteotomies
☐ Complete
☐ Greenstick
☐ Multiple
Other:_____

Grafts-Autogenous
☐ Septal ☐ Auricular
☐ Rib

Implants
_____

Turbinate(s)
Resection of turbinates
Turbinotomy
Mucosal ablation
Other:_____