1. (Dara) Give us a diagram of the nerves and vessels of the nose.

Dara to bring tomorrow – images would not transfer

2. (Dara) What are the standard photodocumentation views for a rhinoplasty.

3. (Kathy) What surgical techniques can be used to increase projection of a nasal tip? Decrease projection?

Projection is preserved when major and minor tip support mechanisms are left largely intact.

**Techniques to increase nasal tip projection enhance major/minor tip support mechanisms:**

a) Autogenous cartilaginous collumellar strut positioned between or below medial crura. (see Fig 45-40).

b) Plumping grafts of cartilage fragments at base of columella. (See Fig 45-42)

c) Subcutaneous tip onlay grafts (see Fig A and B).

d) Dome binding sutures.

e) Cephalic rotation of tip can also increase projection by advancing lateral crura medially and suturing them to lie above cut ends of medial crura.

f) Use of partial-transfixion instead of complete-transfixion incisions, which preserves the medial crural footplate attachment to caudal septum (a major support mechanism). (see Fig. 45-39)

**Techniques to decrease nasal tip projection:**

a) Volume reduction of the LLC (lateral and sometimes medial crus and dome when indicated) as a complete strip (cephalic trim), leave at least an alar strut of 6-8mm (depending on strength of LLC) to prevent external valve collapse. (see Fig F)

b) Volume reduction of LLC using the interrupted strip technique. The residual complete strip, after volume reduction of varying degrees, is divided somewhere along its course (usually at or near the angle, excessive portions of the lateral and occasionally medial crus are removed, and the cartilages are reconstructed so that their cut ends abut or overlap.

4. (Kathy) Discuss nasal proportions and landmarks.

The boundaries of the nose are within the middle third of the face. On lateral view, the nasal starting point begins at the nasion (the deepest depression at the root of the nose), which ideally corresponds to the same level as the superior palpebral fold, and ends at the subnasale (junction of collumella and upper lip). Other important landmarks include the radix (root of the nose, unbroken curve that begins at superior orbital ridge and continues along lateral nasal wall); rhinion (soft-tissue correlate of the osseocartilaginous junction); and supratip (point cephalic to tip). The nose should be in proportion with the rest of the face when divided into thirds horizontally (trichion-glabella-subnasale-menton). The width of the nose should equate to the intercanthal distance. Nasofrontal angle should be 115-135 degrees. Nasofacial angle should range 30-40 degrees.
5. (Josh) What surgical techniques can help get rid of a boxy tip?
6. (Josh) How do you fix a crooked nose?

Have realistic expectations. Determine specific deformities present. Best managed by external approach. If the patient's deformity is primarily in the bony pyramid, then closed with suffice. Determine position of septum and the nasal spine relative to midline. Carry out hump reduction if necessary. For the deviated nose, complete medial osteotomies and low lateral osteotomies are most often used. Once ULCs separated from septum, dorsal deviation can be corrected. If there is significant dorsal septal deviation, as seen in the C-shaped deformity, then an onlay graft can be placed on the concave side to camouflage the deformity. Or a spreader graft carved from septal cartilage can be placed above the intact intranasal mucosa between the septum and the ULC.

7. (Rosow) Major and minor tip support mechanisms. What is the “tripod” theory?

Major nasal tip supports:
1. Size, shape, thickness, and resilience of alar cartilages
2. Upper lateral cartilage attachment to the cephalic margin of the alar cartilages
3. Wrap-around attachment of the medial crural footplates to the caudal septum

Minor nasal tip supports:
1. Anterior septal angle
2. Skin of nasal tip
3. Membranous septum
4. Caudal septum
5. Nasal spine
6. Ligamentous sling spanning the paired domes of the alar cartilages
7. Sesamoid cartilage complex extending the support of the lateral crura to the pyriform margin

The tripod concept of tip projection, support, and rotation described by Anderson provides an understanding of the dynamics of tip rhinoplasty. The anatomy of the two alar cartilages forms a functional tripod that provides tip support. The right and left lateral crura comprise two legs of the tripod, and two conjoined medial crura function as the third leg. Anatomically, the medial crura are shorter than the lateral crura. The medial crural foundation is supported by the attachments to the superior and inferior septum.

8. (Rosow) When and why should we use alar wedge excisions? Where do the incisions go?

If the alar development is excessive and bulbous, excision of a wedge of ala at the alar—facial junction 1 mm to 2 mm above the alar—facial crease will reduce the overall bulkiness of the alar anatomy. Some medial repositioning of the alae may be effected with this maneuver. Reduction of the overall length of the alar sidewalls occurs when generous wedges are excised, ideal in the reduction of the alar flare created when correcting the overprojecting tip.

Some authors believe that incisions that enter the nostril, as above, may result in a “teardrop” or “Q” deformity. They advocate incisions that parallel the alar-facial crease:

9. (Tali) I hate my nose and am going to be your first rhinoplasty patient. Analyze my nose (be kind) and tell me how you can make me pretty. Ask Dr. (your facial plastic surgeon) for help.

The concept of beauty—idea of symmetry. Below are ideal dimensions for nose in relation to entire face. May vary with ethnic nose. There is complex pre-op evaluation for rhinoplasty which involves examination of facial asymmetry and overall facial appearance.

**External nose: should be palpated and inspected**
- Thick vs. thin skin, skin quality - Lesions and scars
- Evidence of trauma - Tip support

**Intranasal exam**
- Septal deformity - Scars
- Nasal airway - Nasal valve - Turbinates
Facial analysis: The Nose
Ideally, one should be able to divide the face into equal vertical thirds: frontal hairline to glabella, glabella to nasal base, and nasal base to chin.
The nose and face can also be divided into horizontal fifths, with the width of the base of the nose approximating the intercanthal distance.

Lateral View
1. Assess Tip projection
   a. Columella to vermillion : base/tip = 1:1
   b. Goode’s ratio: (Alar groove to tip)/ (nasion to tip) = .55 - .6
   Baum’s ratio: (Nasion to tip)/(Subnasale to tip) = 2.8
   c. 3-4-5 triangle describes good tip projection. A line from the nason to the tip is the hypotenuse; a second line is drawn from the nason to the alar crease and connected with a perpendicular line from the tip. (Crumley and Lancer).

2. Assess Tip rotation
   Nasolabial angle (angle of lines of subnasal to top of vermilion border with line from collumella): 90-105° in men 105-120° in women
   Nasofrontal angle (angle of line from glabella to nasion and nasion to tip defining pt): Should be ~120°
   Nasofacial angle (angle form from lines of facial plane (line from glabella to pognion) and line tangent to nasal dorsum): Should be 36°

3. Assess Dorsal Contour:
   a. Should be straight, strong
   b. Slight supratip dip

4. Assess Columellar show
   a. Normal is 2-4 mm of show

Frontal View
1. Assess Symmetry
   a. Is there any deviation?
   b. Any Depression?
2. Assess Dorsal width - Base of bony pyramid should be broader than intercanthal distance
3. Assess Alar width: lateral edge of nasal ala should be at lateral aspect of medial canthus. Distant from nasal ala to nasal ala: ½ interpupillary distance

1. Assess Tip Projection: should be 2/3 of height of columella, 1/3 of width of lobule
2. Assess Nostril Size and Shape: Nostril size should be 1/5 of width of base of nose. Nostrils should be pear-shaped. Are they boxy?
3. Assess Columella: Width should be 1/5 of base of nose
4. Assess Alar lobule width
5. Assess Tip width and shape

10. (Tali) Internal and external nasal valves-what are they, how do you evaluate for collapse and how would you correct it?

The external nasal valve: is formed by the columella, the nasal floor, and the nasal rim (caudal border of the lower lateral cartilage). The nasalis muscle dilates this portion during inspiration. Any process that weakens the lower lateral cartilage can cause collapse of external nasal valve. Overzealous resection of the cephalic margin of the lower lateral cartilages can lead to flaccid collapse of the cartilaginous framework of the lateral nasal wall. Because of this lack of support, the pressure differential across the nasal valve during inspiration causes the lateral nasal wall to collapse.
Dec 13: Rhinoplasty (updated 06/06)

A modified Cottle maneuver can be performed with a cerumen curette placed intranasally to support the external nasal valve, to determine specifically if improvement in nasal airflow results. Minimal stabilization of the external valve during inspiration can dramatically increase airflow on the affected side and confirm the diagnosis. Correction: Alar batten graft used for external valve collapse. Can use internal or external approach. For internal approach, make 6-8 mm incision at site of maximal collapse. Harvest a cartilage batten (septal or conchal) 10-15 mm long and 6-8 mm wide. Develop a subcutaneous pocket under area of collapse medial to piriform aperture to avoid the lateral nasal artery. Make a pocket near the lobule to camouflage the batten. No need for suture closure if pocket properly sized. Can also be performed via external approach.

The internal nasal valve: exists within the middle nasal vault and is formed by the junction of the dorsal septum and the medial edge of the upper lateral cartilage. In addition to being the most resistive segment in the nasal airway, its constituent structures contribute to the contour of the middle nasal vault and nasal dorsal appearance.

Correction: Spreader grafts: target a dysfunctional internal valve and/or narrowed or collapsed middle vault resulting from native weakness in cartilage and/or overresection of the dorsal septum and upper lateral cartilage during prior rhinoplasty surgery. Spreader grafts may be placed endonasally or via the external rhinoplasty approach. Endonasal approach through a small (5-mm) mucosal incision near the anterior septal angle, develop a precise subperiosteal pocket along the length of the cartilaginous dorsum near the junction of the dorsal septum and upper lateral cartilage. Spreader grafts are placed into pockets between upper lateral cartilage and dorsal septum. Thickness ~1-3 mm.

11. (Caroline) Compare and contrast the endonasal vs. open approach.

Endonasal rhinoplasty advantages:
1. Decreased need for surgical dissection
2. Reduced postoperative edema
3. Corresponding decrease in the potential for overall scarring or iatrogenic insult to the nose
4. Ability to make exacting changes in situ
5. Via tactile palpation, a more immediate and predictable ability to feel changes made to the nose
6. Ability to make targeted improvements without taking the nose apart
7. Shorter operative times
8. Theoretical reduction in morbidity, especially in older patients
9. Elimination of any risk (however minimal) for developing a visible external columellar scar
10. Quicker return to a normal appearance

Major disadvantage is exposure.

Advantages of open rhinoplasty
1. Direct exposure, inspection, and assessment of the osseocartilaginous framework
2. Precise modification and stabilization of the abnormality (tip and dorsum modification, graft placement, osteotomies)
3. excellent tool for training purposes.

Disadvantages of open rhinoplasty:
1. transcolumnellar scar and columellar flap necrosis
2. extensive dissection of skin off the osseocartilaginous framework with increased scarring
3. increased operative time (compared with closed rhinoplasty)
4. postoperative nasal tip edema and numbness.

12. (caroline) Help us understand the anatomy of the nasal cartilages.

Cartilaginous septum
- extends from the nasal bones midline above to the bony septum in the midline posteriorly, then down along the bony floor
- quadrangular shape
- flanked by 2 triangular-to-trapezoidal cartilages: the upper lateral cartilages (ULCs)
ULCs are fused to the dorsal septum in the midline and attached to the bony margin of the pyriform aperture laterally by loose ligaments
- inferior ends of the ULCs are free
- internal area or angle formed by the septum and ULC constitutes the internal
Dec 13: Rhinoplasty (updated 06/06)

- Valve
- Adjacent sesamoid cartilages may be found lateral to the ULCs in the fibroareolar connective tissue. Found variably.
- Lower lateral cartilages (LLCs)
- Swing out from medial attachments to the caudal septum in the midline, called the medial crura, to an intermediate crus area
- Flare out superolaterally as the lateral crura
  In some individuals, evidence of a scroll may exist, that is, an outcurving of the lower borders of the upper lateral cartilages and an incurving of the cephalic borders of the alar cartilages. Several variations exist

13. (Scott) What surgical techniques can be used to increase projection of a nasal tip? Decrease projection?

**Methods to increase projection:**
- Lateral crural steal (also increases rotation)
- Tip graft
- Transdomal suture
- Plumping grafts
- Premaxillary graft
- Septocolumellar sutures (buried)
- Columellar strut (variable effect)
- Caudal extension graft
- Dynamic adjustable rotational tip tensioning (DARTT)

**Methods to decrease projection**
- Illusion of projection by enhancing supratip break
- High partial or full transfixion incision
- Lateral crural overlay (also increases rotation)
- Nasal spine reduction
- Vertical dome division with excision of excess medial crura
- with
- suture reapproximation

14. (Paul) Discuss the management of saddle nose deformity. Etiologies?

A saddle-nose deformity is most visibly characterized by a loss of nasal dorsal height. Other features commonly observed in patients with significant saddle-nose deformities include:

- Depression of the middle vault and dorsum
- Loss of nasal tip support and definition
- Shortened (vertical) nasal length
- Overrotation of the nasal tip
- Retrusion of the nasal spine and caudal septum

A saddle-nose deformity can be congenital or acquired. Most saddle-nose deformities are acquired. A common theme in all acquired saddle-nose deformities is a structural compromise of the nasoseptal cartilage leading to decreased dorsal nasal structural support. The most common causes of saddle-nose deformities are traumatic and iatrogenic. Iatrogenic causes include overresection of septal cartilage and overreduction of a nasal dorsal hump. Medical conditions leading to saddle nose include: Wegener’s granulomatosis, relapsing polychondritis, leprosy, syphilis and ectodermal dysplasia. Intranasal cocaine use can also cause saddling.

For patients with no nasal airway obstruction and minor-to-moderate nasal dorsal saddling, onlay grafting techniques can be used. Onlay grafting can be used to augment the dorsum or to camouflage localized areas of depression. Grafts can be placed via endonasal or external (transcolumnellar) rhinoplastic approaches. The precise creation of the subperiosteal pocket can help stabilize the graft placement site. Transcutaneous suture fixation can be used to prevent graft migration. Larger defects and deformities affecting the middle vault or the nasal dorsum require a more structural reconstructive approach. Fundamental to reconstructing the moderate-to-severe saddle nose is restoring middle vault function, reversing any internal valve narrowing, and reinforcing nasal tip and dorsal support mechanisms. The placement of spreader grafts is usually sufficient to address the internal nasal valve and middle vault collapse.

Contraindications to surgical reconstruction include: patients with malignant, chronic, or autoimmune disease conditions; patients who abuse drugs intranasally; and patients who are poor candidates for rhinoplasty in general.

15. (Jeff) Describe intanasal incisions.

Transfixion (or hemitransfixion): Between septum and medial crura of LLC. Transfixion goes through and through, while hemitransfixion only goes through one side

- Intercartilaginous – between ULC and LLC
- Marginal Incision – at the inferior/caudal border of the LLC
- Intracartilaginous incision- going through the LLC transnasally
- Rim Incision – Nasal rim – do not use!
- Killian Incision- unilateral septal incision from posterior-inferior to superior anterior.