Nasal Reconstruction

The University of Texas Medical Branch
Department of Otolaryngology
Grand Rounds Presentation
Resident Physician: Jacques Peltier, MD
Faculty Advisor: Francis B. Quinn, Jr., MD
January 4, 2006
Etiology

- Skin cancer is the most common human malignancy (over 800,000 cases)
  - Most arise on sun-exposed regions in the head and neck
  - The nose is the most common site of involvement and is most common site of recurrence after treatment (30%)
Random Flaps

- Random flap
- Length:width of 3:1 or 4:1
- Most common
- Based on subdermal plexus
- Unpredictable
Length : Width Theory

Increased width of base would increase surviving length (3:1, 4:1)

Surviving length depends on perfusion pressure of the capillaries
Axial Flaps

- Limited by available vessels
- Based on direct cutaneous vessels
- Random flap at distal tip
- Examples
  - nasolabial
  - midline forehead flaps
Nasal Anatomy

- Cartilaginous dorsum, upper lateral and alar cartilages frequently involved
- Often need soft tissue and structural reconstruction of defects
Tip Support

- Three major tip support mechanisms
  - Scroll Area
  - Alar cartilages
  - Medial Crural attachment to caudal nasal septum
Nasal Reconstruction

• Nasal reconstruction among earliest plastic surgical procedures

• Interest continues today
  – Imperfections are recognized
  – Balance of preservation of function and aesthetics
Nasal and Facial Subunits

- Subunits of the face divided into convex and concave surfaces
- Hide scars at junctions of subunits
Nasal and Facial Subunits

- The nose is a separate aesthetic subunit of the face
- The nasal surface has several distinct topographic subunits
- Important for nasal reconstruction
  - Preserve color, thickness, texture
  - Replace tissue with like tissue
Nasal and Facial Subunits

- If 50% or greater of a subunit is to be excised, excise the entire subunit
  - Allows scar camouflage
  - Takes advantage of pincushioning
Nasal Reconstruction

• Interrelationship of skin, skeletal and cartilage support, and lining must often be addressed
• Skin in lower 2/3 thick and sebaceous
• Skin in upper 1/3 thin and transparent
• Little subcutaneous tissue
  – Allows for perichondrial/periosteal involvement
Nasal Reconstruction

• What does patient want?
• Diagnose the nasal defect
  – Subunits, tissue layers, internal structures
• Evaluate for donor materials for missing surface and tissue layers
• Patient’s general health and condition of the skin
Nasal Reconstruction

- Healing by secondary intent
- Dermabrasion
- Primary closure
- Full thickness skin grafts
- Composite grafts
- Random flaps
- Pedicled flaps
Secondary Intent

• Typically for medial canthal defects
• Results in contraction and distortion of nose
• Poor aesthetic outcomes on most defects of nose
Dermabrasion

- Limited to partial thickness defects
- Typically used after nasal reconstruction for refining scars
  - Best for thick sebaceous skin
Primary Closure

- Little redundant skin on nose
- May produce alar or tip distortions
Primary Closure
Full Thickness Skin Graft

- Used instead of STSG to avoid contraction
- Need intact support
- Use like tissue
- Best on younger patients with thin skin
- Best for nasal sidewall subunit defects
Full Thickness Skin Graft
Composite Grafts

- Usually for alar rim or columella
- Less than 2.0 cm
Composite Grafts
Local and Pedicled Flaps

- Most favorable due to like texture, color, and thickness
- Minimal donor morbidity
- Numerous options
  - Bilobed
  - Nasolabial
  - Island Pedicle
  - Dorsal Nasal
  - Glabellar
  - Midforehead
Bilobed Flap

• Most common nasal local flap
• Double transposition flap
• Original description
  – 90 degree arcs
  – final 180 degree arc
• Arcs of 90 to 110 degrees preferable
  – Remove Burrow’s from point of rotation
• Little distortion of alar rim
• Best for defects <1.5 cm in lower third of nose
Bilobed Flap
Bilobed Flap

Figure 9. A and B, Bi-Lobe flap.
Bilobed Flap
Bilobed Flap
Nasolabial Flaps

- Axial Flap - Angular artery
- Inferior and superior flaps
- Useful for alar or tip defects/deep central or lateral nasal defects
- Potential ectropion in superior aspect of nose, scleral show
- Pin cushioning, blunting of nasofacial sulcus
Nasolabial Flaps
Nasolabial Flaps
Nasolabial Flaps
Glabellar Flaps

- Rieger first to describe true rotation style dorsal nasal flap
- Single stage with good color and texture match
- Able to hide scar
Glabellar

Figure 7. A-C. Dorsonasal flap.
Glabellar Flaps
Glabellar Flaps
Glabellar Flaps
Midforehead Flaps

• First described over 2000 years ago
  – Indian rhinoplasty
• Median, paramedian forehead flaps
• Axial pattern (paramedian)
  – supratrochlear artery - at medial brow, 2 cm from midline, thin distal tip, thin pedicle
  – Used for large defects of nose or tip, missing support structures, prior irradiation
• Disadvantages
  – long scar, limited length, revision
Midforehead Flaps
Midforehead Flaps

- Frontalis muscle
- Orbicularis oculi muscle
- Corrugator supercilii muscle
Midforehead Flaps

Flap thinned
Removing frontalis and most subcutaneous fat
Axial vessels preserved
Midforehead Flaps
Midforehead Flaps
Midforehead Flaps
Midforehead Flaps
Structural Support

- May harvest from septum, concha, rib, or cranial bone
- Alar batten grafts often necessary to prevent dynamic collapse
- 3-5 mm L-Strut reconstruction often necessary
Structural Support

- Concha is ideal for alar cartilage graft and alar batten graft harvest
- Little cosmetic sequela from conchal cartilage harvest

(S. Wright et. al.)
Lining Flaps

- Prevent crusting
- Expedite healing
- Prevent long term contracture
Lining Flaps
Lining Flaps
Lining Flaps
Lining Flaps
Lining Flaps
Complex Tip Reconstruction

- Lateral vestibular advancement flap
- Septal mucosal flap
- Septal cartilage harvest
- Alar and L-Strut reconstruction
- Alar batten grafts and tip grafts
- Paramedian forehead flap