Local Skin Flaps

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Grand Rounds Presentation
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Introduction

- Facial defects common
  - Trauma
  - Skin malignancies

- Treatment
  - Secondary healing
  - Skin graft
  - Local flaps
Paradigm

- Etiology
- Cosmesis
- Function
- Patient’s wishes
- Surgeon’s experience
Local Flaps - Classification

- **Blood supply**
  - random
  - axial

- **Tissue movement**
  - rotation
  - advancement
  - transposition
Local Flaps - Blood supply

- Segmental arteries
- Perforating branches
- Direct cutaneous vessels
- Subdermal plexus
Random flaps

- Most common
- Based on subdermal plexus
- Unpredictable

- Length:width of 3:1 or 4:1
Axial flaps

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

- Length:Width
  - Increased width of base would increase surviving length but feeding vessels have same perfusion pressure

- Perfusion pressure
Blood supply

- Supply exceeds requirements
- Changes
  - temperature
  - autonometrics
  - trauma
- Arteriovenous shunts
  - sympathetic control
  - fully opened shunt bypasses capillary bed
Arteriovenous Shunts
Delay phenomenon

- Incise and undermine
- 10 to 21 day delay most common
- No benefit at 3 wks to 3 mos
- Improved blood supply
  - AV shunt closure
  - Conditioning to ischemia
  - Alignment of vessels
Skin stretch

- Elasticity
  - elastin
  - collagen
- tension vs. blood supply
Skin biomechanics

- **Creep**
  - extrusion of fluid in dermis
  - breakdown of dermal framework

- **Stress relaxation**
  - increased cellularity
Skin characteristics

- RSTLs
- LMEs
Facial Aesthetic Units
Planning

- History
  - PVD/CAD, collagen vascular dz, DM, XRT

- Social habits
  - cigarettes?

- Medications
  - ASA, NSAIDs, anticoagulants

- Cause of defect
  - recurrence?
Physical Exam

- Defect
  - size, placement
- Surrounding skin
  - lesions, laxity, color match, scars
- Facial structures
  - functional concerns, lip, lid
- Incision placement
  - RSTLs, BAUs
Planning

- Template
- Draw options/Measure
- Undermine
- Review options/Remeasure
- Incise
- Rotate vs. advance vs. transpose
- Key stitches
- Excise cones
- Close
Flap types

- Rotation
- Advancement
- Transposition

- Not concrete, variations exist
Rotation

- Pivotal flap
- Curvilinear
- Standing cone results
- Two borders
- Broad based
- Uses - cheek, forehead
Rotation flap

Greatest Wound Closure Tension

Backcut  Bürow’s Triangle

Bürow’s Triangle
Transposition

- Rhomboid, dufourmental, bilobed
- Linear axis
- Rotated over intact skin
- Pivot point
- Versatile
Transposition

(geometry
  measure, remeasure

rhomboid
  60 & 120 degree angles

dufourmental
  60 to 90 degree angles

4 choices
Rhomboid flap
Dufourmental Flap
Bilobed

- Double transposition flaps
- Original description
  - 90 degree arcs
  - final 180 degree arc
- Arcs of 90 to 110 degrees preferrable
- Uses - lower third of nose
Bilobed Flap
Advancement

- Sliding movement
- Adequate undermining
- Standing cones created

Types
- Monopedicile, bipedicile, V-Y, A-T, cheek

Uses - forehead, brow
Monopedicle

- Forehead, Brow
- 3:1 ratio
- Burow's triangles
Bipedicle

- Forehead, Brow
- Disadvantage
  - long suture line
V-Y flap
A-T flap

- Bilateral advancement
- Triangular defect
- Uses - hairline, brow, lip
Cheek advancement

- Advancement
- Some rotation
- Use - medial cheek, nasofacial sulcus
- Prevent complications (ectropion)
Cheek Advancement Flap

A

B

C
Nasolabial flap

- Axial pattern - angular artery
- Inferior and superior flaps
- Uses - lower 2/3 of nose, perinasal area, upper lip
- Pin cushioning, blunting of nasofacial sulcus
- Potential ectropion, scleral show
Nasolabial Flap

- Inferiorly based
Nasolabial Flap

- Superiorly based
Midforehead flap

- Indian rhinoplasty
- Median, paramedian forehead flap
- Axial pattern
  - Supratrochlear artery - at medial brow, 2 cm from midline
- Pedicle can be as little as 1.2 cm
- Thin distal tip appropriately

Disadvantages
  - Long scar, limited length, revision
Midforehead Flap

SUPRATROCHLEAR A.

SUPRAORBITAL A.

SUPERFICIAL TEMPORAL A.

DORSAL NASAL A.
Paramedian Forehead Flap
Paramedian Forehead Flap
Postoperative Care

- Pain reliever
- Wound care
  - hydrogen peroxide, antibiotic ointment
- Sutures removed at 5-7 days
- Direct sunlight avoided for 2-3 months
- Dermabrasion - 6-12 weeks
- Revision/Irregularization - 6 months
Complications

- Infection
- Hematoma/seroma
- Cyanosis
- Failure/necrosis

<table>
<thead>
<tr>
<th>Local Factors</th>
<th>General Factors</th>
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<tbody>
<tr>
<td>Blood supply</td>
<td>Age</td>
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<tr>
<td>Denervation</td>
<td>Endocrine function (pancreas, thyroid)</td>
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<tr>
<td>Fluid collection</td>
<td>Drug therapy (antiinflammatory, cytotoxic)</td>
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<td>Infection</td>
<td>Sepsis</td>
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<td>Previous or concurrent</td>
<td>Major organ failure (pulmonary, cardiac, hepatic, renal)</td>
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<td>irradiation</td>
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<td>Mechanical stress</td>
<td>Obesity</td>
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<tr>
<td>Surgical technique</td>
<td>Malignant disease</td>
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Case Presentations

Pick the flap
Example #1

- Left temple defect
Intraop
Example #2

Chin defect
Outcome
Example #3
Postop
Intraop
Before pedicle takedown
After pedicle takedown
Example #5
Intraop
Postop
Example #6
Intraop
Postop
Example #7
Early postop
Late postop
Example #8
Postop
Intraop
Early postop
Example #10
Intraop
Postop

Immediate

6 weeks

6 months