Eyelid Reconstruction
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Objectives

• Etiology of Eyelid Defects
• Anatomy
• Lower Eyelid Reconstruction
• Upper Eyelid Reconstruction
• Reconstructive Techniques
• Jeopardy/Quiz Bowl
Etiology

• Trauma
Etiology

• Excision of Cutaneous Malignancy
  – Basal Cell Carcinoma
  – Squamous Cell carcinoma
  – Malignant melanoma
  – Sebaceous carcinoma
  – Microcystic adnexal carcinoma
Etiology

• Excision of Cutaneous Malignancy [6]
  – Basal Cell Carcinoma 90%
  – Squamous Cell carcinoma 5-10%
  – Malignant melanoma uncommon
  – Sebaceous carcinoma uncommon
  – Microcystic adnexal carcinoma uncommon
Mohs Cure Rates

• BCC – primary 99%, recurrent 92%
• SCC - primary 98%, recurrent 95%
• Melanoma – MIS and thin melanoma (<1mm)
  » 0-5% local recurrence in 2-5 yrs.
Anatomy

- Skin surface
- Muscular anatomy
- Blood supply
- Tarsoligamentous Sling
- Bilamellar construct
- Lacrimal System
(a) Right eye, accessory structures

- Eyelashes
- Palpebra
- Palpebral fissure
- Medial canthus
- Lacrimal caruncle
- Lateral canthus
- Sclera
- Limbus
- Pupil
Orbicularis Oculi
Orbicularis Oculi
Vascular Supply
Bilamellar Unit

• Anterior lamella
  – Skin and orbicularis oculi

• Posterior lamella
  – Eyelid retractors, tarsal plate, and conjunctivae
Upper Lid Retractors

- Orbicularis oculi:
  - Orbital part
  - Palpebral part
  - Ciliary part

- Levator palpebra

- Tendon of superior oblique muscle
- Superior tarsal plate
- Medial palpebral ligament
- Fascia covering inferior tarsal plate
Upper Eyelid Retractors

- Superior rectus muscle
- Orbicularis oculi muscle
- Levator palpebrae superioris
- Muller's muscle
- Superior tarsal plate
- Inferior tarsal plate
- Palpebral conjunctival plate
- Optic nerve
- Vitreous
- Inferior rectus muscle
Lid Protractors
Lacrimal Drainage System
Lacrimal Drainage System
Tear Film
Reconstruction

- Anterior lamella

- Posterior lamella (Full thickness defects)

- Eyelid Margin
  - Upper/Lower
  - Size
Goals of Lid Reconstruction

• Protection of eye
• Adequate skin and muscle for closure/blink
• Smooth epithelialized posterior lid surface
• Posterior apposition of lid to globe
• Stable lid margin, canthal angle, and shape
• Cosmesis with minimal scars
Anterior Lamella Reconstruction

- Laissez faire*
- Primary closure
- Full Thickness Skin Grafts
- O-S Plasty
- Rhombic Flap
- Musculocutaneous Advancement Flap
- Unipedicle Advancement Flap
- Transposition Flap
RSTL
Skin Grafts

- **FTSG – preferred**
  - Sites
    - Upper eyelid
    - Pre/post-auricular skin
    - Supraclavicular skin
    - Inner upper arm skin

- Relative contraindication
  - Compromised vascularity of wound bed
    - Irradiation
    - Third degree burns [1]
O-S and O-Z plasty
Rhombic Flaps
Musculocutaneous Advancement Flap
Unipedicle Advancement Flap
Transposition Flap
Reconstruction

- Anterior lamella

- Posterior lamella (Full thickness defects)

- Eyelid Margin
  - Upper/Lower
  - Size
Posterior Lamella Reconstruction

- Replacing lost conjunctiva
  - Buccal mucosa - preferred
  - Hard palate mucosa – persistent keratinization
  - Turbinate mucosa - loses goblet cells after transfer
  - Tarsoconjunctival free graft

- *tarsus reconstruction with auricular or nasal septal cartilage/mucosa graft
Posterior Lamella Recon

• Replacing lost tarsus
  – Insertion of cartilage graft
    • Warping
    • Weight
    • Unnecessary?
      – Tarsal plate histology – connective tissue with collagen, no cartilage.
      – *Facial nerve paralysis

  – Insert mucosal graft with tension and globe apposition
Posterior Lamella Reconstruction

- **Orbicularis Oculi Defect**
  - Greater defect tolerated in upper lid
  - Lower lid more prone to ectropion

- **Canthal Ligament defect**
  - Refixation to bone — burr holes, anchor, periosteal flap

- **Levator palpebrae defect**
  - Reinsert remnant vs frontalis m. flap

[5]
Reconstruction

- Anterior lamella
- Posterior lamella (Full thickness defects)
- Eyelid Margin
  - Upper/Lower
  - Size
Goals of Margin Reconstruction

- Perfect alignment for cosmesis and tear film distribution
- Consider lash deficit
# Lid Reconstruction

<table>
<thead>
<tr>
<th>Size of Margin Defect</th>
<th>Repair</th>
</tr>
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<tbody>
<tr>
<td>&lt;25%</td>
<td>Direct closure</td>
</tr>
<tr>
<td>25-50%</td>
<td>Direct closure with lateral cantholysis</td>
</tr>
</tbody>
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Primary Closure

Defect <25%

Create Pentagonal Wound

Reapproximate gray line perfectly first

Perform lateral cantholysis if 25-50%
Location of margin sutures

A
B
C

Tarsus

7-0 silk
Lateral Cantholysis (25-50%)

DIVIDING THE OUTER CANTHAL LIGAMENT

leave the upper ligament intact

excise this dog ear

dog ear sutured

undermined
Primary Closure
## Lower Lid Reconstruction

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<td>Direct closure with lateral cantholysis</td>
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<tr>
<td>33-66%</td>
<td>Semicircular flap (Tenzel)</td>
</tr>
<tr>
<td>50-75%</td>
<td>Semicircular flap with periosteal flap</td>
</tr>
<tr>
<td>50-100%</td>
<td>Tarsococonjunctival Flap (Hughes)</td>
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</table>
Tenzel Semicircular Flap

- 33-66%
Tenzel Semicircular Flap
Markings and lesion
Periosteal Flap

- Angle 45 degrees
- Reflect inferomedially
- 50-75%
## Lower Lid Reconstruction

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Tarsocconjunctival Flap - Hughes

- 50-100%
- 4mm tarsus spared
- Divide 6 weeks later
### Upper Lid Reconstruction

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<td>33-66%</td>
<td>Semicircular flap with periosteal flap</td>
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<tr>
<td>50-100%</td>
<td>Cutler-Beard Flap</td>
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Cutler Beard Flap

Other - Composite Graft
Median Forehead Flap, PMFF also
Name the segments of orbicularis
What glands are located in the lid margin/tarsus?

Lashes?
What is the tarsus composed of?
What flap is marked?

Markings and lesion
• Name the upper lid retractors
What is the lower lid retractor?
Figure 2.12
An 85-year-old man with a partial-thickness tarsal defect, moderate eyelid margin laxity, and taut, inelastic skin. Reconstruction included an 8-mm pentagonal resection/repair and an advancement skin flap dissected beyond the lateral canthus.
Figure 2.37

In cases with sufficiently lax and supple lower eyelid skin, the classic Hughes procedure can be modified with a horizontally directed skin flap as the anterior lamella replacement (see Fig. 2.38).
Thank You

• Questions?
References


