Only the Mohs Knows: Management of Periocular Skin Cancers

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Overview

- Common Eyelid Skin Cancers
- Management Options for Removal of Eyelid Skin Cancers
- Reconstruction Of Eyelid Defects
POLLING QUESTION

- What is your level of training?
- 1. Medical student
- 2. Ophthalmology Resident
- 3. Ophthalmologist
- 4. Oculoplastic Surgeon
Eyelid Neoplasms

- 2/3 Benign
- 1/3 Malignant
Rule of 9s

- 90% Basal Cell
- 9% Squamous Cell
- 0.9% Sebaceous Cell
Features of Malignancy

- Destruction of lid architecture
- Lash loss
- Telangiectasias
- Rapid Growth
- Nodular appearance
- Central Ulceration
- Recur after excision
Basal Cell Carcinoma

- 700,000 new cases each year
- 90% are in the head and neck (10% eyelid)
- Usually 6th – 7th decade
- 5 – 15% age 25 – 40
- Fair Complexion
Basal Cell Carcinoma

- 53% lower eyelid
- 27% medial canthus
- 12% upper eyelid
- 8% lateral canthus
Basal Cell Carcinoma
Basal Cell Carcinoma
Gorlin Syndrome

- aka Basal Cell Nevus Syndrome
- Autosomal Dominant
- 1 in 31,000 people
- Most develop BCCs in adolescence or early adulthood
Associated Findings in Gorlin Syndrome

- Keratocystic odontogenic tumors
- Medulloblastomas and fibromas (ovarian and cardiac)
- Palmar and plantar pits
- Cleft lip or palate
- Frontal and temporoparietal bosssing
- Hypertelorism
- Mandibular prognathism
- Scoliosis or kyphosis
- Bifid ribs
Gorlin Syndrome

- Defect in Patched 1 gene (PCTH1)
  - tumor suppressor gene that inhibits the hedgehog signaling pathway
Roles of Sonic Hedgehog signaling:
- Limb development
- Neural differentiation
- Facial morphogenesis
Vismodegib

- Approved by FDA in Jan 2012 for tx of locally advanced or metastatic basal cell carcinomas
- Blocks hedgehog pathway
- Works by inhibiting SMO

$250/pill
Inhibiting the Hedgehog Pathway in Patients with the Basal-Cell Nevus Syndrome

- Jean Tang et al, 2012
- Randomized, double-blind, placebo-controlled
- 41 patients with Basal Cell Nevus Syndrome followed for mean of 8 months
Inhibiting the Hedgehog Pathway in Patients with the Basal-Cell Nevus Syndrome

- Lower rate of new BCCs with vismodegib
  - (2 vs 29 cases/group/year)
- Larger decrease in size
  - (-65% vs -11%)
Inhibiting the Hedgehog Pathway in Patients with the Basal-Cell Nevus Syndrome

- 54% of patients discontinued treatment due to side effects
  - Loss of taste
  - Muscle cramps
  - Hair loss
  - Weight loss
- Dysgeusia and muscle cramps resolved in 1 month
- Hair growth resumed within 3 months
Inhibiting the Hedgehog Pathway in Patients with the Basal-Cell Nevus Syndrome

- After stopping vismodegib:
  - BCCs and pits recurred at same sites
  - Sum of the longest BCC diameters returned to baseline

- Lower rate of new surgically eligible BCCs after treatment with vismodegib
  - (0.69 per month vs 2.4 per month)
3 months on vismodegib
Squamous Cell Carcinoma

- **Risk Factors**
  - Sun exposure
  - Fair Complexion
  - Radiation Exposure

- **Metastatic Potential**
  - 0 – 40%
  - Regional Nodes and Distant Sites
  - Potential for perineural invasion
Squamous Cell Carcinoma
Sebaceous Gland Carcinoma

- “masquerade”
- Propensity to recur
- Metastatic potential
- More common in upper eyelid
- 65-70% Female, 7-8\textsuperscript{th} decade
- 1% in Europe and 30% in Asia
- 22% mortality
Sebaceous Gland Carcinoma
Melanoma

- Rare in the periocular region though lentigo maligna (in situ) lesions are common in the malar region
- Malignant transformation of normal skin melanocytes
- Blonde hair, blue eye
- Areas with high UV exposure
Melanoma

- **History**
  - Unprotected extensive sun exposure
  - Pre-existing pigmented lesion
  - May occur de novo
  - Historical change in pigment density, distribution or surface
  - New nodule formation in a flat lesion
Melanoma

- Exam – A, B, C, D, E
- Asymmetry
- Border
- Color
- Diameter > 6 mm
- Evolving
Melanoma

Breslow depth

- Stage I < 0.75mm
- Stage II 0.75 - 1.5mm
- Stage III 1.51 - 2.25mm
- Stage IV 2.26 - 3.0mm
- Stage V > 3.0mm

Tumor depth vs 5 yr survival

- <1mm 95-100%
- 1-2mm 80-96%
- 2-4mm 60-75%
- >4mm 50%
Sentinel Lymph node biopsy
Sentinel Lymph Node Biopsy

- Identifies 20-25% of patients who have occult nodal disease
- Identifies patients who may need lymphadenectomy and/or adjuvant therapy
  - Improves survival
    - 30% improvement in 10 year survival
Melanoma - treatment

- Wide margin excision – permanent sections
  “slow Mohs”
  - Typically 1 cm margin in other areas
  - Eyelid margins of thin melanomas(<2mm) 5mm considered adequate in one study
Management

Step 1 = BIOPSY

- Kersten, Ophthalmology 1997
- 2% of clinically benign lesions turned out to be malignant
- *All excised lesions should be sent for pathologic evaluation*
- If clinical suspicion of malignancy is high and path result does not agree, consider rebiopsy
Where to Biopsy?
Biopsy!

- Shave, Incise, Excise
- Just Do It!
POLLING QUESTION

What is your preferred method for removing basal cell carcinoma from the eyelid?

1. Resect in OR with wide margins
2. Resect in OR with frozen section margin control
3. Mohs surgery
4. Electrodesiccation with curettage
Management Options

- Resection with frozen sections
- Mohs micrographic surgery
- Radiation
- Chemotherapy
- Cryotherapy
- Electrodessication and Curettage
- Immunotherapy (Aldara)
Management Options

- Resection with frozen sections
- Mohs micrographic surgery
Surgical Resection

- Requires coordination with pathologist
- 20 – 30 minutes OR time per frozen section (if you are lucky!)
- Single procedure
- Recurrence Rate for Primary BCC= 5.5%
- Recurrence Rate for Recurrent BCC= 18%
Mohs Micrographic Surgery

- Described by Fred Mohs in the 1930s
- General Surgeon at U W Madison
- First described as micrographic chemosurgery
- Color coded mapping of tumor margins
- Microscopic control of margins
Mohs Micrographic Surgery

- 1953 - Dr. Mohs was filming removal of an eyelid carcinoma and had a delay and used frozen sections instead of fixed sections

- 1969 - Mohs publishes paper with 66 BCC and SCC of the eyelid with 5 year cure rates of 100%
Mohs Micrographic Surgery

- Dermatologic Surgeon/Pathologist performs excision and reviews frozen sections
- Allows separation of resecting and reconstructing surgeon
- Preserves the most normal tissue
- Recurrence Rate with primary BCC = 1%
- Recurrence Rate with recurrent BCC = 8%
Mohs Micrographic Surgery
Resection with Frozen Sections

- Small Central Nodular Tumor
- Amenable to pentagonal wedge resection
- Older patients who desire a single setting procedure
Resection with Frozen Sections

- **Melanocytic Lesions**
  - “slow Mohs”
  - Permanent rather than frozen sections

- **Sebaceous Gland Carcinoma**
  - Resection of eyelid mass with “wide margins”
  - Topical MMC chemotherapy of conjunctival and corneal involvement
Now the tumor is gone. What next?
Eyelid Reconstruction - Principles

- Follow the reconstructive ladder (maybe)
- Don’t burn bridges
Eyelid Reconstruction - Principles

- Avoid vertical traction on the eyelid margin
- Don’t hesitate to support the lateral canthus!
Eyelid Reconstruction - Principles

- Close deep tissue first with appropriate suture to avoid undue tension on skin edges
- Undermine widely
  - Often allows simple closure
- Anterior and Posterior Lamellae need to be reconstructed separately
  - Only one may be a free graft
Eyelid Reconstruction - Anatomy

- Anterior Lamella
  - Skin
  - Orbicularis
- Posterior Lamella
  - Tarsus
  - Conjunctiva
Eyelid Reconstruction - Anatomy

- Deep head pretarsal orbicularis (Horner's muscle)
- Deep head preseptal orbicularis (Jones's muscle)
- Posterior reflection of medial canthal tendon
- Posterior lacrimal crest
- Lateral orbital tubercle
- Lateral palpebral ligament
- Lateral palpebral raphe
- Anterior reflection of medial canthal tendon
Anterior lamella defects
What would you do?
POLLING QUESTION

HOW WOULD YOU CLOSE THE DEFECT?

1. Skin graft
2. Advancement flap
3. Granulate
Patient after Mohs’ surgery – large defect in right lower eyelid, sparing the lid margin
Surgical Planning –
O-Z Double Advancement Flaps
Creating skin flaps
Closure and excision of dog ear deformity
O-to-Z closure, before and after
O-to-Z closure, before and after
O to Z Closure (the IOL flap)
O to Z Closure
O to Z Closure
Double advancement flaps
Full Thickness Skin Graft Donor Sites

- Upper eyelid
- Pre/Post Auricular
- Supraclavicular
- Volar surface of the upper arm
Full Thickness Skin Graft
Lower Eyelid Defects

- **Up to 25 %**
  - Direct closure
  - Lateral canthotomy and inferior cantholysis

- **25 – 50 %**
  - Tenzel semicircular flap

- **Greater than 50 %**
  - Hughes flap + skin graft
  - Hewes flap + Trippier flap
  - Mustarde flap
POLLING QUESTION

How do you close the eyelid margin?

1. 3 non-absorbable sutures across the margin
2. Vertical mattress suture
3. Buried vertical mattress suture
Buried vertical mattress margin suture
s/p Mohs
Tenzel Flap
Tenzel Flap
Tenzel Flap
Tenzel Flap
Tenzel Flap
Hughes Flap
Hughes Flap
Hughes Flap
Hughes Flap
Hughes flap

Orbicularis oculi and levator aponeousis

Muller’s muscle and conjunctiva
Hughes Flap
Hughes Flap
Hughes Flap
Hughes Flap
Hughes Flap

Grooved director

Mucosal border higher than skin
Hughes Flap
Hughes Flap
Hughes Flap
Hewes Flap
Pre-op after Mohs’ surgery
Hewes flap – posterior lamella

- Tarsus and conjunctiva, upper lid
- Superior tarsal border
Hewes flap – posterior lamella

Tarso-conjunctival flap
Hewes flap – posterior lamella

Tarso-conjunctival flap filling defect in lower eyelid.
Hewes – anterior lamella

Upper eyelid skin and orbicularis flap
Hewes – anterior lamella

Anterior lamellar flap from upper eyelid replacing lower eyelid defect.
Hewes flap – closure of upper lid harvest site
Hewes flap – outcome
Mustarde Flap
Mustarde cheek rotation flap
Mustarde Flap
Mustarde Flap
Mustarde Flap
Cheek rotation flap
Medial Canthal Defects

- Granulate (secondary intention)
- Skin Graft
- Upper eyelid flap
- Glabellar Flap
- Paramedian forehead flap
Full Thickness Skin Graft
s/p Mohs
s/p FTSG
Upper eyelid transposition flap
Upper eyelid transposition flap
Upper eyelid transposition flap
Upper eyelid transposition flap
Rhomboid Flap
Rhomboid Flap
Glabellar Rotation Flap
s/p Mohs
Glabellar Rotation Flap
Glabellar Rotation Flap
Upper Eyelid Defects

- **Up to 25 %**
  - Direct closure +/- canthotomy/cantholysis

- **25 – 50 %**
  - Tenzel flap
  - Tarsal transfer flap

- **Greater than 50%**
  - Cutler Beard Flap +/- graft
“Reverse” Tenzel
s/p melanoma resection
Cutler Beard Flap
Cutler Beard Flap
Cutler Beard Flap
Cutler Beard Flap
Cutler Beard Flap
Cutler Beard Flap
Cutler Beard Flap
Cutler Beard Flap
COMPLEX MOH’S DEFECT PLANNING
SEBACEOUS CELL CARCINOMA
The lacrimal system

- The punctum and proximal canaliculus are often excised with medial canthus and lower lid tumors
- Reconstruct with silicone stent when there is residual canaliculus
If no canalicular system
– late reconstruction
with Jones tube
Summary

- Suspect malignancy
  - Especially BCC
- Biopsy all suspicious lesions
- Know your local Mohs surgeons
- Use basic reconstructive procedures
Don’t Forget Your Sunscreen
Don’t forget your sunglasses!
I can’t wait to see what this tan will look like… in 30 years
THANK YOU!