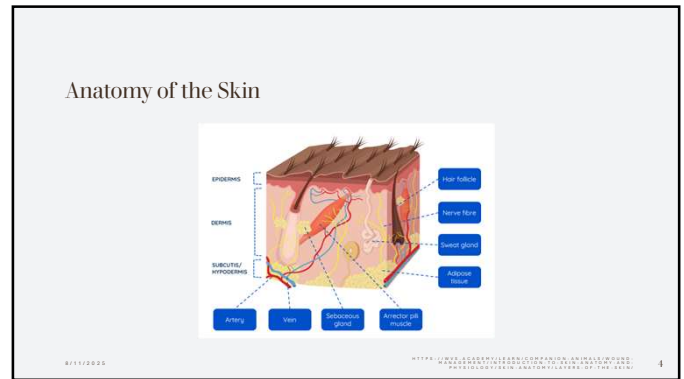
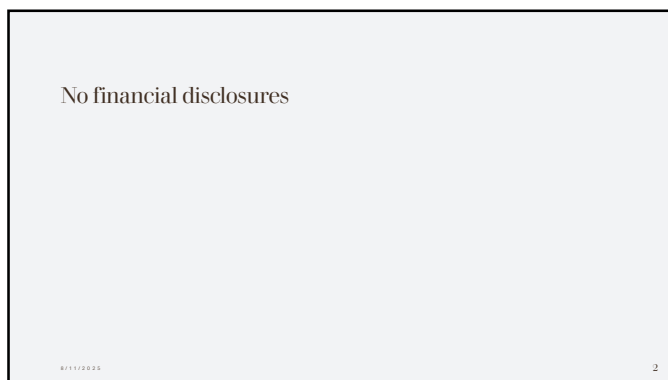




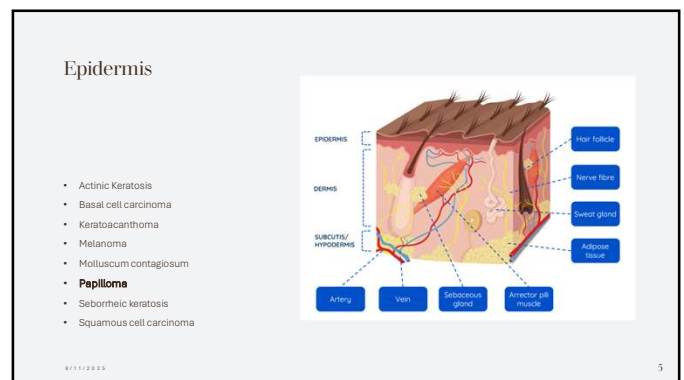
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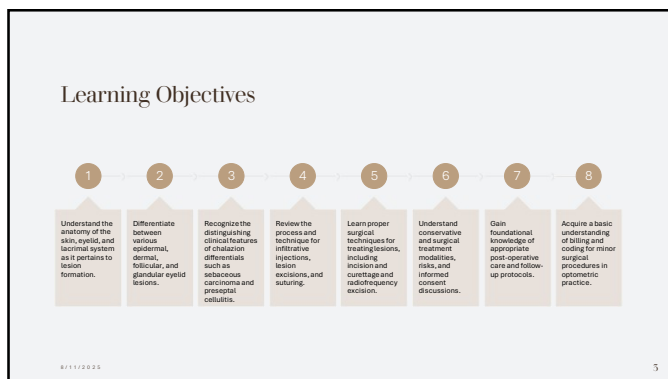
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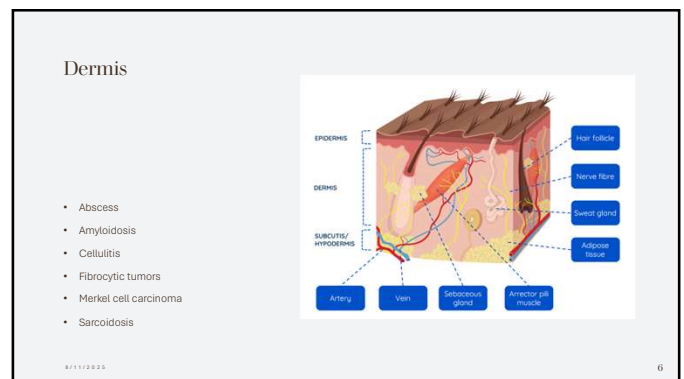
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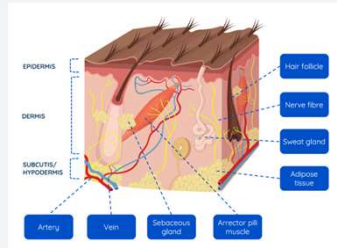
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## Hair Follicle

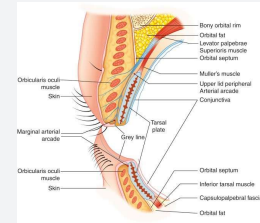
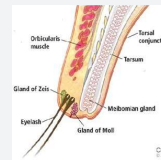
- Epidermoid cyst
- Trichilemmoma
- Trichilemmal carcinoma
- Trichilemmal cyst



7

## Eyelid Cross Section

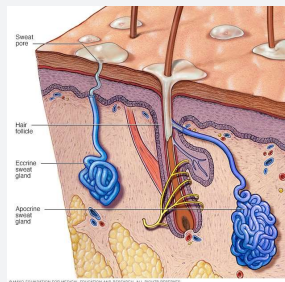
- Eyelid skin is thinnest skin in the body
  - Allows for quicker healing and less scarring



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## Sweat Glands

- Apocrine gland
  - Apocrine hidrocystoma
  - Apocrine adenoma
- Eccrine gland
  - Eccrine hidrocystoma
  - Eccrine adenoma



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## Surgical Anatomy Terminology



Considered in lamellar layers



Upper eyelid

Anterior lamella  
Middle lamella  
Posterior lamella



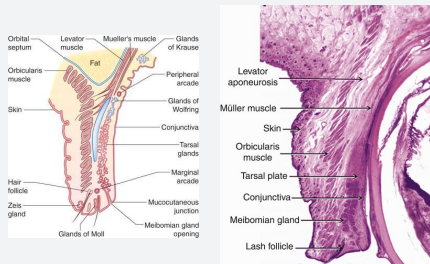
Lower eyelid

Anterior lamella  
Posterior lamella

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## Eyelid Anatomy

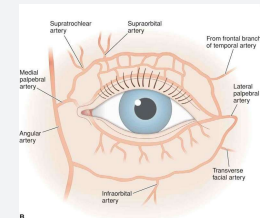
- Orbicularis Oculi
- Tarsal Plate
- Meibomian Glands
- Hair Follicles
- Glands of Moll
- Glands of Zeiss



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## Vascular Supply of the Eyelids

- **Marginal Arcades**
  - Ophthalmic and lacrimal arteries branch into medial and lateral palpebral arteries
  - Travel through the septum and anastomose to form the tarsal arcades
  - Located between orbicularis and tarsal plate
  - Then anastomose with the superficial temporal, transverse facial, and infraorbital arteries
- **Periophthalmic Arcades**
  - Upper eyelid has secondary peripheral arcades
  - You will have more bleeding in procedures of the upper eyelid
  - Superior branch of medial palpebral arteries
  - Supply orbicularis, skin, conjunctiva, and tarsal glands



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## Sensory Innervation of the Eyelids

### OPHTHALMIC DIVISION (V1) OF TRIGEMINAL NERVE

- Lacrimal
  - Innervation of lateral upper lid
- Frontal
  - Supratrochlear
    - Innervation of medial upper lid
  - Supraorbital
    - Innervation of central upper lid, forehead, scalp
- Nasociliary
  - Infraorbital
    - Innervation of medial aspect

### MAXILLARY DIVISION (V2) OF TRIGEMINAL NERVE

- Zygomaticofacial
  - Innervation of lateral lower lid
- Infraorbital
  - Forms the external nasal, internal nasal, and palpebral branches
    - Innervation of lower eyelid and conjunctiva

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## Application of Infiltrative Anesthesia



### Pre-tarsal subcutaneous block

- Anesthesia to anterior lamellae
- Skin, orbicularis, septum, anterior tarsal plate
  - Subcutaneous injection



### Retrotarsal block

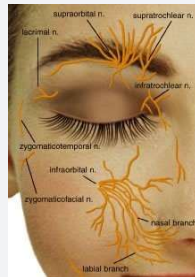
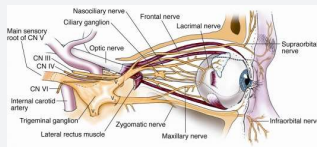
- Anesthesia to posterior lamellae
- Posterior tarsal plate, palpebral conjunctiva
  - Sub-conjunctival injection

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## Sensory Innervation of the Eyelids



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## Infiltrative (Anesthetic) Injections

### Prepare Medication

- 1 mL syringe with 27-gauge 1/2 inch needles
- Draw up to a full mL (dependent on size of lesion)

### Patient Asepsis

- Wipe area with either alcohol or betadine

### Insert Needle

- Pull patient's skin taut for better accuracy
- Insert needle bevel up at 15-degree angle

### Injection

- Slowly inject medication
- Pro tip: pause after small amount of medication is injected to allow for better patient comfort

### Withdraw Needle

- Safely withdraw needle and immediately dispose into sharps container

### Apply Pressure

- Apply light pressure to injection site and softly massage
- Too much pressure/massage may cause vasovagal response

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## Injectable Anesthetics



- Lidocaine 2% (shorter acting), bupivacaine (longer acting)

- Epinephrine addition
  - Vasoconstricts
  - Keeps anesthesia more local
  - Less bleeding
  - Some risk in heart disease

- Sodium bicarbonate addition
  - Increases pH
  - Causes less sting and can improve diffusion of bupivacaine
  - Does decrease shelf life of anesthetic

- For optometric procedures we commonly use lidocaine

- For longer ophthalmic procedures bupivacaine is considered

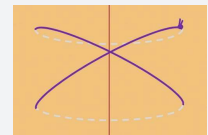
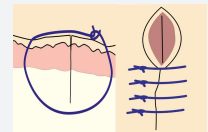
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## Suturing IOI

- Occasionally, you will need to close a wound
- Simple interrupted suture
- Figure 8 (or Figure X) suture
- Alternatives to suturing
  - Wound closure adhesive
  - Steri-strips



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## Drainage Versus Total Excision

### DRAINAGE

- Less painful as no infiltrative injection is needed
  - Like draining a blister
- More likely to recur since cyst wall is not removed

### TOTAL EXCISION

- Less likely to recur since cyst wall is removed
- Higher risk of post-operative complications
- Requires use of infiltrative (anesthetic) injection

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## HIDROCYSTOMA

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## Drainage Procedure

### Pre-Operative

- Blood Pressure and pulse
- Informed consent

### Procedure

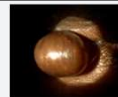
- Asepsis
- Utilize bevel of small gauge needle to insert into lesion and make a vertical "cut"
- Utilize cotton tipped applicators or forceps and gauze to drain
- Apply antibiotic ointment to area

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## Hidrocytoma Classifications

### • Smith versus Robinson

- Smith (solitary)
  - Skin-colored, dome-shaped
  - Usually along lower lid and canthus
  - Females > males
- Robinson (multiple)
  - Smaller in diameter
  - Females > males
  - Associated with hyperhidrosis, high humidity environment, Graves disease



### • Apocrine versus Eccrine

- Apocrine (originates from apocrine sweat glands)
  - Usually adjacent to hair follicles
  - Firm, dome-shaped, blue/grey-hued or milky
  - Proliferative
  - Do not increase in size due to humid/hot weather
  - Found: upper/lower eyelids, eyebrow, canthi, periorbital
- Eccrine (originates from eccrine ducts)
  - Considered a retention cyst
  - Small and translucent (will transilluminate!)
  - Made worse by hot/humid weather and excess sweating
  - Mainly found medial or lateral canthi

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## Total Excision of Hidrocystoma

### Pre-operative

- Obtain blood pressure and pulse
- Informed consent

### Procedure

- Asepsis
- Infiltrative injection
- Create incision or utilize scissors
- Drain lesion
- Remove cyst wall
- Suture (if applicable)
- Apply abx ung

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## Post-Operative Care of Hidrocystoma



Re-measure blood pressure and pulse and ensure patient is safe to leave the clinic



Educate on potential post-operative complications



Have patient apply abx ung twice daily for 7-10 days



Follow up as needed for observation/suture removal

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## EPIDERMOID CYST

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## Epidermoid Cyst Attributes

- Benign, slow growing cyst
- Usually solitary, round, elevated, and freely mobile
- Contents appear "feta cheese-like"
- Usually painless, but can become infected and inflamed
- Cause: buildup of epidermal cells (dead skin cells) in a confined space



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LAKESIDE EYE CLINIC... EYELID CYSTS

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### Excision of the Epidermoid Cyst

- Begin with obtaining blood pressure and pulse and informed consent
- Patient asepsis
- Anesthetize area **underneath** the lesion
- Make a small incision
- Utilize tissue forceps, cotton tipped applicators, and surgical scissors to remove all contents
- **MUST** remove cyst wall or the cavity will refill
- May need to suture if the wound is 3mm or larger



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### Post-Operative Care of Epidermoid Cyst Excision

- Same as hidrocystoma!
- ♥ Re-measure blood pressure and pulse and ensure patient is safe to leave the clinic
- 👉 Educate on potential post-operative complications
- 📅 Have patient apply abx ung twice daily for 7-10 days
- ✓ Follow up as needed for observation/suture removal

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### PAPILLOMA

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### Papilloma Classifications

- Sessile
  - Attached directly by the base
  - Wound size will be the size of the full lesion
- Pedunculated
  - An elongated stalk of tissue



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## RADIOFREQUENCY OR TRADITIONAL EXCISION?

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### Radiofrequency (RF)

- Works by generating heat using high-frequency waves to simultaneously cut and coagulate tissue
- Must be used on wettened skin
  - Unit heats up the water molecules between the probe and the grounding plate
- Minimally invasive and more precise than a scalpel



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### Traditional Excision



#### Procedure

- After local anesthetic, a blade or pair of surgical scissors can be used to excise papilloma
- Goal is to shave or cut as close to the base as possible
- Traditional methods are easier to perform on pedunculated papillomas

#### Post-operative care

- Hemostasis with sterile gauze
- If no contraindications, may cauterize with RF unit (but WHY???)

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### Radiofrequency Excision

#### Procedure

- After local anesthetic, radiofrequency can be used to excise a papilloma
- There are different electrode shapes, each serving a different cutting or excision style
- Circular loop electrode easily removes a pedunculated papilloma, aimed at the base of the lesion
- A ball electrode better removes a sessile papilloma, ablating the lesion layer-by-layer

#### Post-operative care

- RF has minimal to no bleeding post excision
- Immediate post-operative application of steroid cream
- Minimizes risk of scarring

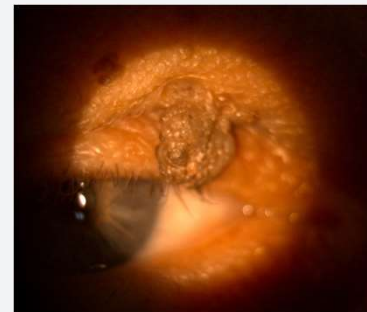
#### Contraindications

- Use of oxygen tank or similar equipment
- Use of pacemaker
- History of keloid or hypertrophic scarring

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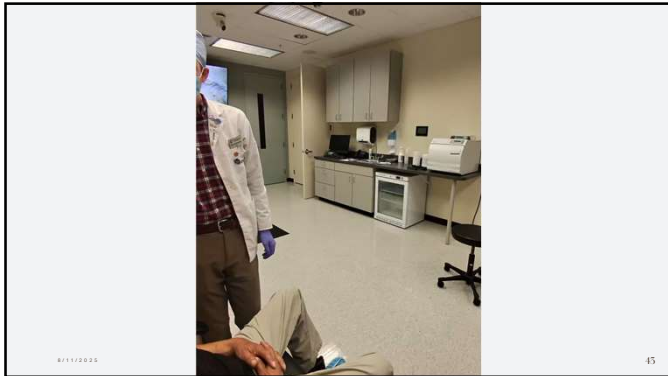


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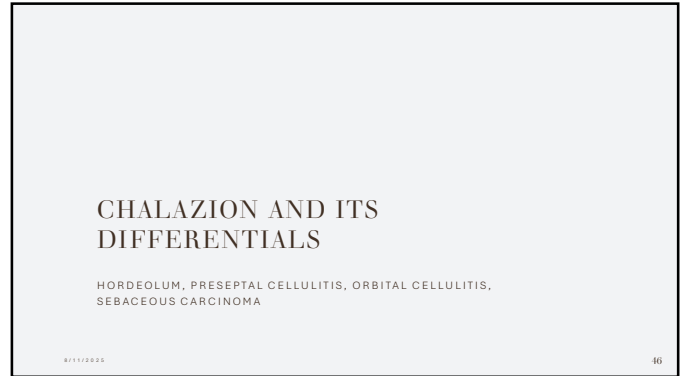
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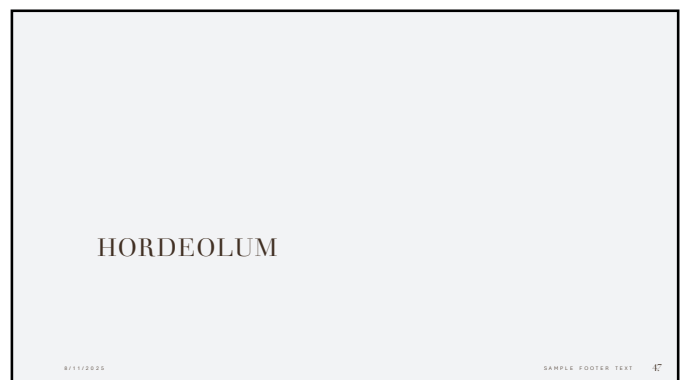
### Complications of Papilloma Excision

- Bleeding if lesion is vascularized
- Scarring
  - Mitigated with immediate s/p application of abx/steroid with RF
- Hypertrophic – continual collagen production causing visible scar
- Keloid – thicker and more disorderly arranged excess collagen
- Lid notching
- Recurrence
  - Especially if not fully excised

Keloids vs. Hypertrophic Scars

<https://michaelmmd.com/blog/the-difference-between-keloid-hypertrophic-scars>

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### Post-Operative Care of Papilloma Excisions

- Repeat blood pressure and pulse
- Achieve hemostasis
  - Either sterile gauze and pressure or use of RF unit
- Steroid cream application, if applicable
- Have patient apply abx ung twice daily for 7-10 days
- Follow up as needed for observation/suture removal

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### Chalazion versus Hordeolum

#### HORDEOLUM

- Acute
- Inflammatory or infectious
- Painful to touch
- Can become a chalazion

#### CHALAZION

- Chronic
- Inflammatory
- Not painful, firm to the touch
- Can become further inflamed or infiltrated by a pathogen

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## Treatment of Hordeolum



Surgical intervention is NOT recommended in cases where active infection is present

As infection subsides may be removed with incision and curettage



Palliative methods are the standard

Warm compresses  
Oral antibiotics

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## Azithromycin



Commonly used as a Z-Pak

- 5-day course of azithromycin

Macrolide antibiotic

MOA: inhibits bacteria from making protein

- Binds to the 50s subunit of the ribosome

Safe for pregnancy!

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## Side Quest: Antibiotics!



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## Doxycycline



Tetracycline antibiotic

More side effects

- Teeth discoloration
- Bone growth retardation
- IIH

Contraindicated in pregnancy and children

MOA: inhibits bacteria from making protein

- Binds to the 30s subunit of the ribosome

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## Augmentin



- Penicillin based antibiotic that targets the cell wall
- Amoxicillin PLUS clavulanic acid (penicillinase inhibitor)
- Better gram (-) coverage
- MOA: inhibit transpeptidase (linking of peptidoglycan)
  - Prevents bacteria from growing
  - Clavulanic acid prevents bacterial resistance
- Small chance of hypersensitivity

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## PRESEPTAL AND ORBITAL CELLULITIS

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SAMPLE FOOTER TEXT 54

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## Preseptal Cellulitis



Eyelid or adnexal infection



Usually has accompanying redness and chemosis



May spread from existing lid lesion or adjacent sinuses

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SEBACEOUS CARCINOMA

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## SEBACEOUS CARCINOMA

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## Treatment of Preseptal Cellulitis

- Oral antibiotic to prevent further infection or worsening of condition
- Has an opportunity to worsen to orbital cellulitis



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SEBACEOUS CARCINOMA

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## Sebaceous Carcinoma



Cancerous lesion of a sebaceous gland

Mainly seen in adults over the age of 60

VERY rare, but aggressive

Often present similarly to a chalazion

- However, these WILL recur – a clinical indicator of malignancy

Associated with madarosis

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SEBACEOUS CARCINOMA

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## Preseptal versus Orbital



**Differ in:**  
Location, severity, symptoms, and treatment



**Location:**  
Preseptal: limited to soft tissue in front of orbital septum  
Orbital: spread behind orbital septum  
• Affects orbit, EOMs, adipose tissue



**Severity:**  
Preseptal <<<<<<< Orbital



**Symptoms:**  
Orbital will have severe eye pain, painful and/or restricted EOMs, proptosis, fever, blurry/loss of vision



**Treatment:**  
Orbital requires treatment with IV antibiotics versus oral antibiotics for preseptal

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## Statistics of Sebaceous Carcinoma

**Incidence**

- Rare, accounts for <1% of skin cancers
- Higher prevalence in Asian populations

**Location**

- 75% occur in eyelid

**Recurrence Rate**

- Up to 30% after surgical removal

**Metastasis Risk**

- 20-25% develop regional lymph node metastasis
- 5-10% metastasize to lungs, liver, or brain

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## Diagnosis and Treatment of Sebaceous Carcinoma



REQUIRES CONFIRMATION VIA BIOPSY



COMPLETE SURGICAL EXCISION CRUCIAL TO PREVENT METASTASIS



MANY TIMES, EXCISION IS FOLLOWED UP WITH RADIATION AND/OR CHEMOTHERAPY IN CASES WHERE BIOPSY MARGINS ARE POSITIVE OR THERE IS EVIDENCE OF METASTASIS

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## What is a Chalazion?

- Chronic lesion that is considered lipogranuloma
  - Aka a nodule of granulomatous material
- Occur due to stagnant materials and secretions in tarsus
- Singular or multiple
- Recurrent
- Benign!!!
- Affect all ages, frequent adult population more
- More likely to occur on upper eyelid



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## Morbidity and Mortality

### Mortality rate

- 5-year survival rate is 50-90%
- Higher mortality rate in cases with metastasis (up to 50%!)

### Morbidity

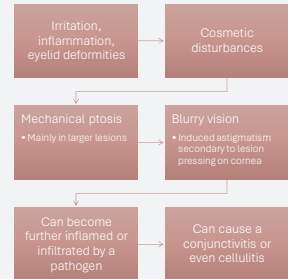
- Significant due to aggressive nature
- Local tissue damage
- Vision impairment
- Metastasis

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## Complications of a Chalazion



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## CHALAZION

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SAMPLE FOOTER TEXT 63

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## Treatment Methods

- Conservative
- Intralesional injection
- Intense pulsed light therapy (IPL)
- Incision and curettage
- Combination Therapy

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## Conservative Treatment of the Chalazion



EYELID HYGIENE



WARM COMPRESSES



ANTIBIOTICS NOT  
USUALLY INCLUDED

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## Incision and Curettage

Usually indicated for large lesions that are creating ptosis or inducing astigmatism

Indicated if a biopsy of the lesion is warranted

Begins with local anesthetic

Utilizes clamp placement to access lesion from the palpebral conjunctiva

Small incision created and contents disrupted using curette and cotton-tipped applicators

Wall of lesion must be removed to prevent recurrence

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## Intralesional Injections

- Effective due to anti-inflammatory action of steroid medications
- Possess vasoconstrictor properties
- Great option for difficult lesions, cautious patients, or those with contraindications for other therapies
- May cause hypopigmentation in patients with African-American descent
- Use caution in patients that are or could be steroid responders



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## Pre-Operative Care



Obtain informed consent

Review potential risks and complications



Obtain vitals

BP/pulse



Describe the procedure



Answer any questions the patient may have

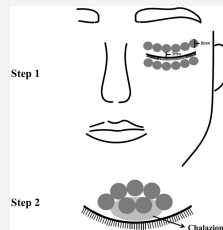
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## Intense Pulsed Light Therapy

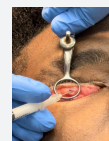
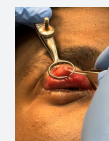
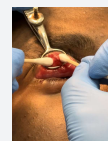
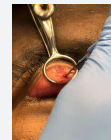
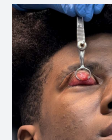
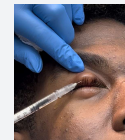
- Brief pulses of non-coherent and polychromatic light to obtain antimicrobial and anti-inflammatory effects
- Usually performed in conjunction with meibomian gland expression
- Great option for those intolerant or unable to injections or surgical excision
- Has shown to have similar efficacy to incision and curettage
  - Acute lesions respond quicker than chronic lesions
  - May require multiple sessions 2-4 weeks apart
- Extra benefit of improving meibomian gland function
- Technique:
  - Topical anesthetic and corneal shield placement prior to procedure
  - Apply thin layer of ultrasound gel
  - Two passes of traditional MGD treatment followed by 2-3 pulses directly on top of lesion



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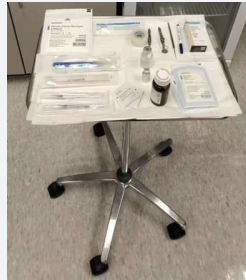


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## Surgical Tools Utilized



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## Perform Thorough Curettage



- Using a properly sized curette, aggressively scramble the contents of the chalazion to loosen them from the surrounding wall

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## Clamp Placement

- Once anesthetic is verified administer a drop of proparacaine 0.5%
  - Makes the placement of the clamp much more comfortable for the patient
- Apply clamp with the ring facing the globe
- Thoroughly tighten the clamp so the lid is secure when everted
- Evert lid to expose the chalazion from the palpebral side



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## Express Contents

- Can use curette and/or cotton tipped applicators
- Important to express the entirety of the contents of the lesion



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## Make Initial Incision

- Locate chalazion within the clamp
- Using a scalpel, make initial incision
  - Usually 1-3 mm wide – remember a larger wound may require sutures!
  - Ensure you continuously tighten the clamp as the lid volume will decrease
  - 11-blade versus 10-blade



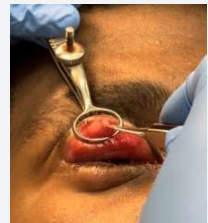
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## Remove the Wall

Using tissue forceps and surgical scissors remove full chalazion wall to prevent recurrence



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## Optional Combination Steroid

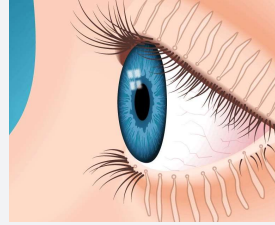


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## Meibomian Glands Impacted by I&C?



- Meibography used in study in 2022
  - Reveals global improvement of the meibomian gland (MG) health post I&C
- Earlier intervention shows significant restoration of MG architecture
- Additionally other dry eye syndrome parameters improved
  - TBUT, OSDI scores
- Specific mechanisms still unknown

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## Post-Operative Care of Incision and Curettage

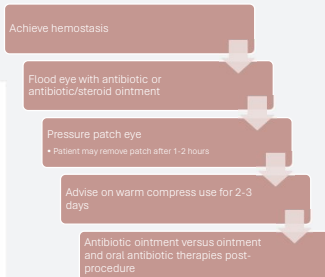
**THE EYE CENTER**  
Post-Operative Patient Handout

**Wound care:**

- ☐ If primary dressing, remove pressure patch after 1-2 hours
- ☐ Do not scrub or pick at wound site
- ☐ Clean gently with soap and water to remove any dried blood or crust
- ☐ Apply prescribed \_\_\_\_\_ to the area twice daily for one week
- ☐ Do not use warm compresses as much as you can tolerate over the next 3-5 days
- ☐ If a bandage you may have taken for pain, anesthesia or sedation, or these medications can increase the risk of bleeding
- ☐ Do not rub the eye

**When to Contact the Office:**

- **Excessive bleeding**
  - If there is persistent or severe bleeding, or if bleeding continues, contact the Eye Center at (800) \_\_\_\_\_
- **Signs of infection**
  - If you develop any signs of infection (redness, pain, swelling, discharge, or fever), contact the Eye Center at (800) \_\_\_\_\_
- **Fever**
  - If your temperature is greater than 100.3°F for more than 24 hours, contact the Eye Center at (800) \_\_\_\_\_



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## Billing and Coding for Lesions

If billing procedure on same day of an exam remember your ~25 modifier!

- ICD 10 Codes
  - Chalazion
    - Right U/L H00.11/H00.12
    - Left U/L H00.14/H00.15
  - Papilloma D23.1x
    - Do not use skin tag!!!
  - Eyelid Cyst
    - Right U/L H02.821/H02.822
    - Left U/L H02.824/H02.825
  - Benign neoplasm: skin/eyelid D23.1xx
- CPT Codes
  - Excision of lesion eyelid 67840
  - Chalazion
    - Single 67800
    - Multiple 67801
  - Intraleisional injection 11900
    - Modifier if additional to I&C (-59)
  - Incision and drainage
    - Single lesion 10060
    - Multiple lesions 10061
  - IPL 17999
  - Anterior Segment Photography 92285

Global Period = 10 days

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## Combination Therapy Considerations

### Combination of I&C with steroid injection

- Reduces recurrence rate
- Decrease in healing time
- Ability to use transpalpebral approach
- Lessens risk of hypopigmentation

### Combination of I&C with IPL therapy

- Shows decrease in healing time
- Aids in prevention of new chalazia
- Aids in structural improvement of meibomian glands

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## Dilation and Irrigation

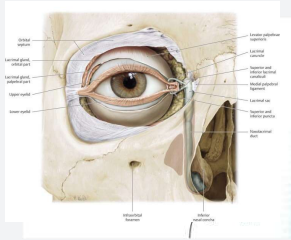
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## Lacrimal System Review

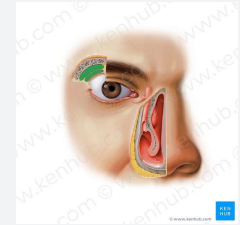
- Responsible for ocular comfort, resistance to disease, and optimal visual function
- Excretory system
  - Drains 90% of tear film
  - Puncta
  - Canaliculi
  - Lacrimal sac
  - Nasolacrimal duct



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## Lacrimal Sac

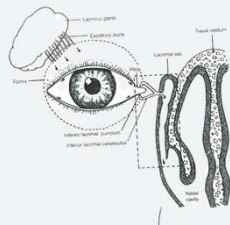
- Located within the fossa of the medial orbital wall
- Surrounded by fascia
- Medial palpebral ligament straddles the lacrimal sac
  - Creates tension to create the suction
- Check ligaments of the medial rectus lie behind lacrimal sac



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## Puncta

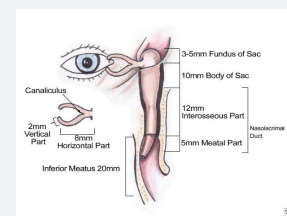
- At the lacrimal puncta there will be slight elevation of the tissue
  - Changes with age
- Forms the junction of lacrimal and ciliary portion of the eyelid
  - Lacrimal portion: nasal to punctum
    - 1/6<sup>th</sup> of the total area of the lid margin
  - Ciliary portion: temporal to punctum
    - Remaining 5/6<sup>th</sup> of the lid margin
- Tear drainage
  - Around 60% is through lower and 40% through upper punctum
    - This is debatable and varies by source
    - Some sources state only 90% of tears are drained and 10% is evaporated



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### Nasolacrimal Duct

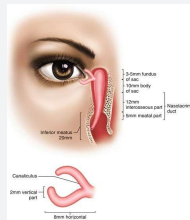
- Lacrimal sac then empties into the nasolacrimal duct at the nasolacrimal canal within the maxillary bone
- Duct runs vertically approximately 15mm
- Duct terminate at the inferior meatus
- Opens at the Valve of Hasner
  - Mucosal tissue that prevents fluid movement up into the nasolacrimal system
  - Up to 50% (!!!) of babies have a blocked Valve of Hasner



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## Canaliculi

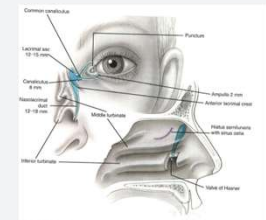
- Elastic tissue surrounded by orbicularis muscle
  - Pumping mechanism to create suction
- Vertical portion
  - 2mm with slight dilation at the ampulla (base)
- Horizontal portion
  - 8mm
- Common canaliculus
  - Upper and lower join to advance to the lacrimal sac



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### Evaluation of Lacrimal System

- Observe puncta
- Apply gentle pressure to lacrimal sac/ canaliculi area
- Observe nasal cavity
- Jones Testing
  - Jones 1
    - Dye disappearance test
    - Instill NaFI into cul-de-sac and wait 5 minutes
    - Positive test = patency
  - Jones 2
    - Dilution and irrigation
    - Diagnostic and can be therapeutic

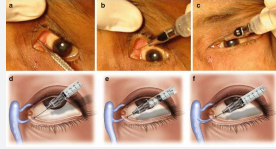


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## Process of the Dilatation and Irrigation Procedure

- Anesthetize inferior punctum with 0.5% topical proparacaine or liquid lidocaine
- Dilate punctum
- Insert lacrimal cannula on 3cc syringe
  - Start vertically then rotate horizontally to follow anatomy of cannula
- Inject sterile saline
- Patient should report tasting saline and be triggered to swallow
- Positive = patency



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<https://www.reviewsofophthology.com/articles/learn-how-to-irrigate-the-lacrimal-system>

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## Conclusions



There are many procedures an OD can perform in select states



It is important to have a thorough discussion with your patient about their diagnosis and all treatment options



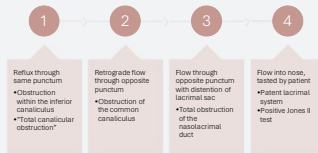
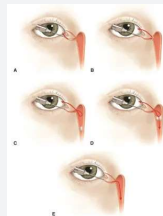
Even if you do not perform these procedures, it is important to recognize these lesions and be able to educate your patients and make an informed referral

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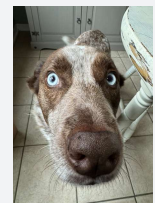
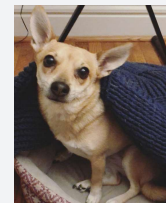
## D&I Procedure Outcomes



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## THANK YOU!

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## Billing and Coding for Dilation and Irrigation

### ICD-10 Codes

- H04.56x - Punctal stenosis
- H04.22x - Epiphora d/t insufficient drainage

### CPT Code

- 68801 – Dilation of lacrimal punctum

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SAMPLE FOOTER TEXT 96

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