Evaluation of Eyelid Lesions

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Background: 5% to 10% of skin cancers occur on eyelid; examine patients carefully and consider risk factors (eg, age, exposure to sun, skin color, and location)

Benign lesions: symmetric with regular borders, do not cause bleeding, respect architecture of normal tissue, and do not cause loss of tissue or distort tissue; case examples — include seborrheic keratosis, syringoma, pyogenic granuloma, eccrine cyst, papilloma, xanthelasma, neurofibroma, and infection with Molluscum contagiosum and methicillin-resistant Staphylococcus aureus (MRSA)

Malignant lesions: basal cell carcinoma (BCC) — most common malignant eyelid lesion; usually seen in middle-aged, fair-skinned patients; nodular type common; does not metastasize aggressively; typically has pearly edges with dimple in middle; telangiectatic vessels; distorts surrounding area, and has poorly demarcated border; squamous cell carcinoma (SCC) — can cause metastasis and death; flat, crusty plaque; sun exposure increases risk; presence of 1 lesion strongly predicts presence of others; sebaceous cell carcinoma — 17% to 28% of patients have metastases with very high rate of mortality; lesion difficult to identify (may resemble chalazion); more common in women and older patients; may show papetoid spread; may need to biopsy multiple sites; may resemble blepharitis; appearance neither flat and plaque-like (eg, SCC) nor raised and pearly with telangiectatic vessels (eg, BCC); melanoma — difficult to detect; risk factors include light skin, red hair, and exposure to sun; lesions have poorly defined borders, irregular pigmentation, and slightly raised appearance; causes metastases and death

Mnemonic for differentiating lesions: A, asymmetry; B, border; C, color; D, diameter

Treatment: radiation and cryotherapy not primary treatment for BCC or SCC; Mohs micrographic surgery has lowest rate of recurrence for recurrent or primary lesions

Chalazion: located within first 10 mm of eyelid (extent of tarsus); not located medial to punctum (where tarsus ends); duration of onset and presence or absence of pain clues to diagnosis; pleomorphic adenoma of lacrimal gland distinguished from chalazion by location above tarsus; lift eyelid with Desmarres forceps to view lesions of lacrimal gland; canaliculitis often raised appearance; causes metastases and death; decreases in proteoglycans and glycosaminoglycans causes dehydration of tissue and thinning of skin; epidermis and dermis loosen and separate more easily, with accumulation of edematous fluid; exposure to sun stimulates progeria

Effects of aging on periorbital area: rhytids and wrinkles increase; cheek and malar fat pad descends; fat pads descend and deflate, pulling lower eyelid down (ie, increasing MRD2); brow descends, frontalis acts more, and more rhytids appear in forehead; ligamentous support system for eyelids that condenses into medial canthus and lateral canthal tendons loosens, causing decreased length of horizontal eyelid fissure; height of eyelid crease increases; skin of eyelid thins and sags; orbital septum becomes slightly dehiscent, leading to prolapse, bulging, or herniation of orbital fat pads into lower and upper eyelids

Ptosis: normal upper lid rests ≈1 mm below superior limbus; ptosis defined as reduction in MRD1, blocking superior visual field; involutional ptosis — most common; called aponoetic ptosis; levator muscle functions normally; insertion of levator aponeurosis (LA) into anterior face of tarsal plate weakens and slips posteriorly and superiorly, pulling fibers coming from LA to skin through orbicularis muscle and increasing height of upper lid crease; superior visual field defect seen with ptosis reverses with taping of upper eyelid

Ptosis or lid malposition after intraocular surgery: most probably due to stretching of tendon by eyelid speculum; horizontal

Exophthalmos: possibly misdiagnosed as thyroid disease, despite absence of pain, discomfort, weight loss, tremors, anxiety, and normal thyroid function tests; requires imaging study; may be associated with mucocele

Recognition and Management of Common Eyelid Malpositions

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Normal position: in young individuals, brow located near or just above orbital rim; lid crease well defined without excess fold of skin; lower eyelid sits at or just beneath inferior limbus; upper eyelid sits just below superior limbus, with slight upper slope from medial canthus to lateral canthus of lower lid; standard measurements — MRD1, distance from pupillary light reflex to margin of upper lid; MRD2, distance from light reflex to margin of lower lid; normal values, MRD1 ≈4.5 mm and MRD2 ≈5.5 mm; upper eyelid crease highest between pupil and medial limbus (≈8 to 10 mm) and slightly higher in women; eyelid crease slopes down to ≈5 mm laterally and to 7 mm medially

Changes in eyelid over time: histologic changes in skin include loss of fibroblasts that produce elastin and collagen; decreased elastin causes looseness; decrease in proteoglycans and glycosaminoglycans causes dehydration of tissue and thinning of skin; epidermis and dermis loosen and separate more easily, with accumulation of edematous fluid; exposure to sun stimulates progeria

Educational Objectives

The goal of this program is to improve the diagnosis and treatment of eyelid lesions and malpositions. After hearing and assimilating this program, the clinician will be better able to:

1. Examine patients for malignant lesions of the eyelid.
2. Differentiate malignant from benign lesions.
3. Summarize the normal architecture of the eyelid and the changes that occur as a result of aging.
4. Evaluate and choose the optimal surgical approach to correct involutional ptosis.
5. Evaluate and choose the optimal surgical approach to correct ectropion and entropion.

Faculty Disclosure

In adherence to ACCME Standards for Commercial Support, Audio-Digest requires all faculty and members of the planning committee to disclose relevant financial relationships within the past 12 months that might create any personal conflicts of interest. Any identified conflicts were resolved to ensure that this educational activity promotes quality in health care and not a proprietary business or commercial interest. For this program, the faculty and planning committee reported nothing to disclose.
stretched may account for higher incidence of lower eyelid entropion and ectropion after surgery; study in 1998 found 7.3% incidence of ptosis 6 mo after cataract surgery

**Evaluation:** fix brow with finger and measure lid excursion during downgaze and upgaze; >12 mm seen with normal levator function; minimal or no levator function defined as less than 4 to 5 mm; assess tear function with fluorescein; temporary dry eye occurs after ptosis surgery; examine for other causes of ptosis, eg, Horner syndrome, cranial nerve III palsy, myasthenia gravis, and congenital ptosis

**Surgery:** suspend eyelid from brow with donor or autologous fascia lata or silicon rods as frontalis sling for ptosis with poor levator function; alternatively, advance LA to correct ptosis caused by dehiscence of LA; internal tightening of Mueller muscle increasingly used

**Choice of approach:** external approach — make skin incision in eyelid crease to advance LA; facilitates removal of excess skin and works for any degree of dehiscence of levator; contour less predictable and reoperation rate high; internal approach — Mueller muscle-conjunctival resection (MMCR) corrects only mild to moderate ptosis (**ie**, <2 mm); avoids skin incision and scar; contour better and rate of reoperation ≤3%, vs 10% to 20% with external levator advancement; **speaker's algorithm** — for severe involutional ptosis (MRD1 ≤2 mm), perform levator advancement; for mild to moderate ptosis, test with drop of 2.5% phenylephrine (which sympathomimetically stimulates Mueller muscle); if response good after 5 min, perform MMCR; if response poor, perform external levator advancement; previously used levator advancement if dermatochalasis present, but has achieved better results recently with MMCR followed by blepharoplasty

**External levator advancement:** make standard markings for upper lid blepharoplasty with lower mark at position of newly formed eyelid crease (set at end of surgery); perform standard blepharoplasty to remove excess skin; speaker takes skin flap unless lid excessively bulky requiring both skin and muscle; open orbital septum, expose pre-aponeurotic fat pad, and dissect from underlying levator muscle; disinsert muscle from tarsal plate (peripheral arcade located in between, with Mueller muscle and conjunctiva just underneath); suture levator muscle (partial thickness) to tarsal plate (speaker prefers Mersilene braided polyester suture) with 1 to 3 sutures; advance LA and secure to tarsal plate with adjustable sutures; check height and contour of eyelid while patient looks ahead and adjust if necessary; close wound and reform eyelid crease by taking bites through LA in orbicularis oculi and anterior lamellar tissue; cut and suture together; speaker uses 6/0 chromic suture buried in tissue up to create double fold of Mueller muscle and conjunctiva; clamp tissue; speaker runs 6/0 chromic suture back, closing conjunctival edges and tarsal border; excise tissue within clamp and remove clamp; run 6/0 chromic suture back, closing conjunctival edges and bury in eyelid at nasal edge of wound

**Mueller muscle-conjunctival resection:** place traction suture in eyelid; evert eyelid over retractor; mark position 4 to 5 mm superior to superior tarsal border on basis of response to phenylephrine test; place 6-0 silk traction suture through area; pull tissue up to create double fold of Mueller muscle and conjunctiva; clamp tissue; speaker uses 6/0 chronic suture buried in eyelid tissue; some surgeons go from external to internal with prolene or nylon suture; sutures pass through base of clamp through Mueller muscle and conjunctiva, securing it to superior tarsal border; excise tissue within clamp and remove clamp; run 6/0 chronic suture back, closing conjunctival edges and bury in eyelid at nasal edge of wound

**Complications:** more frequent with external levator advancement; lagophthalmos (sometimes temporary); exposure keratitis common; incidence of reoperation for overcorrection, undercorrection, and asymmetry ≤20% with external surgery, ≤5% with MMCR; wound dehiscence and infection rare; retrobulbar hematoma (especially with vision loss) extremely rare

**Congenital ptosis:** usually caused by defect in development of levator muscle; can occur unilaterally or bilaterally; child may have head tilt; not problematic as long as pupil not occluded and developmental milestones met; surgery — if little or no levator function present, perform frontalis sling; if muscle function normal, perform levator advancement; MMCR successful if ptosis mild; children with unilateral ptosis may develop amblyopia; **third nerve palsy** — complete ptosis, lack of eye movement, and dilated pupil; usually results from aneurysm in posterior communicating artery; pupillary fibers involved first; **Horner syndrome** — mild ptosis and smaller pupil; MMCR used

**Lower eyelid malpositions:** primarily involutional ectropion and entropion; snap-back test detects laxity of eyelid; eyelid distraction test not useful; important to assess lateral canthus and strength of fixation; horizontal eyelid laxity predisposes eyelid to turn outward or inward (determined by presence or absence of strong attachment of lower eyelid retractors and capsulopalpebral fascia, which stabilize tarsal plate); if retractors function well, gravity causes entropion; poor adherence of eyelid to eye produces discomfort, dry eye, tearing, and ocular surface disease; if retractors not stable, dehiscient, or not attached well to inferior tarsal border, force of orbicularis muscle combined with eyelid laxity causes eyelid and tarsal plate to roll inward; creates keratopathy that can threaten sight

**Floppy eyelid syndrome:** decreased elastin and increased collagen in tarsal plate cause easy evasion of eyelid, laxity, and eyelid malposition, ectropion, and entropion; causes chronic conjunctivitis, episora, burning sensation, chronic production of mucus, and tearing; **characteristics** — frequently associated with sleep apnea; symptoms bilateral or often unilateral on side on which patient sleeps; treatment — shortening and tightening of eyelids with wedge resection or lateral tarsal strip (gold standard); artificial tears, topical steroids, and sleep goggles

**Involutional ectropion:** caused by horizontal lid laxity and disinsertion of lateral (typically) or medial canthal tendons; eyelid falls away, leading to chronic conjunctival inflammation, hypertrophy, and keratinization; medial part often more ectropic first; as eyelid loosen, gravity causes it to fall away (**ie**, ectropion)

**Surgery:** *pentagonal wedge resection* — removes section of eyelid and provides square tarsal edges to sew together; *lateral tarsal strip* — (gold standard) perform lateral canthotomy and cantholysis; create strip of lateral tarsus and suture to internal periosteum of lateral orbital rim; *variations* — access through upper lid blepharoplasty incision (transblepharoplasty canthopexy or canthopexy sine canthotomy); isolate lateral canthal tendon and suture to lateral orbital rim; *medial ectropion* — if mild, create medial conjunctival spindle and resect retractors from conjunctival surface of lower lid underneath punctum; pass double arm suture through diamond of tissue, pull together, pull retractors upward, and pass sutures out through eyelid skin; *lazy T procedure* — dissect out lateral canthal tendon horizontally and vertically; combines wedge resection of medial eyelid just lateral to punctum; resect triangle of conjunctiva medial to and underneath punctum; suture together as with medial spindle; *medial canthoplasty* — use skin-muscle flap pulling medial lower eyelid upwards and medially or suture inferior crus of medial canthal tendon to lateral canthal tendon or periosteum

**Cicatricial ectropion:** caused by shortening of anterior lamella after trauma, burns, lower eyelid surgery, or inflammation; treatment — tighten eyelid horizontally, release scar, and replace tissue with full-thickness skin graft; *differentiation from involutional ectropion* — with cicatricial form, not possible to push lower eyelid up to pupil without moving cheek, or patient cannot open mouth without pulling eyelid down

**Congenital ectropion:** various causes include Treacher Collins syndrome of regressive plepharon and anterior lamellar short- age, blepharophimosis, and ichthyosis; all require variations of anterior lamellar replacement (eg, skin graft, repositioning of periocular tissues and grafts)

**Involutional entropion:** caused by horizontal laxity, laxity of lower lid retractors, and hypertrophied and vertically mobile preseptal orbicularis muscle that overrides pretarsal orbicularis and turns eyelid in toward eye; entropthalmos predisposes; treatment — tighten eyelid, reinsert retractors through capsulopalpebral fascia to tarsal plate, and remove portion of preseptal
orbicularis muscle or barricade it from overriding pretarsal muscle (gold standard); Quikkert suture — used when full procedure delayed or in patient who cannot undergo full procedure; pass suture through conjunctival fornix and exit from eyelid skin; procedure modified by moving position of suture vertically to just beneath lashes to create more rotation; suture dissolves and leaves scar band to keep eyelid in position; not as successful as full procedure; retractor repair — incise eyelid just beneath lashes; leave pretarsal orbicularis on tarsal plate; dissect behind orbicularis muscle to orbital rim; incise septum, retract fat pad to expose retractors, and suture retractors to bottom of tarsal plate; usually combined with lateral tarsal strip; may resect portion of orbicularis muscle

Transient spastic entropion: usually seen with eyelid inflammation or swelling; possible precursor to involutional entropion

Congenital entropion: due to hypertrophied orbicularis muscle or shortage or poor development of tarsal plate; important to differentiate from epiblepharon (large pretarsal skin fold)

Cicatricial entropion: assess amount of tarsal plate (possibly shortened), amount of scar contracture, and state of caustive disease; either replace tarsal plate with graft of hard palate or split lid and recess anterior lamella; Weis procedure (tarsal fracture) full-thickness tarsotomy with rotational sutures; perform full-thickness blepharotomy just beneath eyelid through tarsal plate and place sutures to rotate margin of eyelid outward

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Suggested Reading
1. Which of the following constellations of characteristics is most consistent with a diagnosis of basal cell carcinoma of the eyelid?
   - (A) Symmetric lesion with regular borders that does not cause bleeding and respects the architecture of the surrounding tissue
   - (B) Lesion that resembles a chalazion and shows pagetoid spread
   - (C) Lesion that resembles a flat, crusty plaque
   - (D) Lesion with pearly edges, a dimple in the middle, and telangiectatic vessels

2. Which of the following constellations of characteristics is most consistent with a diagnosis of squamous cell carcinoma of the eyelid?
   - (A) Symmetric lesion with regular borders that does not cause bleeding and respects the architecture of the surrounding tissue
   - (B) Lesion that resembles a chalazion and shows pagetoid spread
   - (C) Lesion that resembles a flat, crusty plaque
   - (D) Lesion with pearly edges, a dimple in the middle, and telangiectatic vessels

3. Which of the following constellations of characteristics is most consistent with a diagnosis of sebaceous carcinoma of the eyelid?
   - (A) Symmetric lesion with regular borders that does not cause bleeding and respects the architecture of the surrounding tissue
   - (B) Lesion that resembles a chalazion and shows pagetoid spread
   - (C) Lesion that resembles a flat, crusty plaque
   - (D) Lesion with pearly edges, a dimple in the middle, and telangiectatic vessels

4. A lesion located in which of the following possible locations is most likely to be a chalazion?
   - (A) Near the eyebrow
   - (B) Medial to the punctum
   - (C) Within the first 10 mm of the eyelid

5. Which of the following is not characteristic of involutional ptosis?
   - (A) Upper lid rests >1 mm below the superior limbus
   - (B) The MRD1 is reduced
   - (C) Levator muscle functions poorly or not at all
   - (D) Insertion of levator aponeurosis (LA) into the tarsal plate is weak

6. After external levator advancement to correct ptosis, the rate of reoperation for overcorrection, undercorrection, and asymmetry is typically 10% to 20%.
   - (A) True
   - (B) False

7. Which of the following techniques is(are) most appropriate to correct a case of congenital ptosis in which little or no levator function is present?
   - (A) External levator advancement
   - (B) Mueller muscle-conjunctival resection
   - (C) Frontalis sling

8. Horizontal eyelid laxity in the presence of strong attachment of the lower eyelid retractors predisposes the lid to which of the following disorders?
   - (A) Ectropion
   - (B) Entropion

9. Which of the following procedures is considered the gold standard for treatment of involutional ectropion?
   - (A) Pentagonal wedge resection
   - (B) Lateral tarsal strip
   - (C) Canthopexy sine canthotomy
   - (D) Lazy T procedure

10. A patient who cannot open his or her mouth without pulling the eyelid down is most likely to have which of the following?
    - (A) Involutional entropion
    - (B) Involutional ectropion
    - (C) Cicatricial ectropion
    - (D) Floppy eyelid syndrome