

The occasional eyelid lesion

Mitchell Crozier,
BHK¹,
Sarah M. Giles, BSc,
MD²

¹School of Medicine, Faculty
of Medicine,
University of Ottawa,
Ottawa, ON, Canada,
²Department of Family
Medicine, Faculty of
Medicine, University of
Ottawa, Ottawa, ON,
Canada

Correspondence to:
Sarah M. Giles,
smgiles@dal.ca

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INTRODUCTION

Physicians in the primary and urgent care settings frequently encounter patients presenting with acute inflammatory eyelid nodules and eyelid swelling. The external hordeolum, which is a painful infection involving the eyelid and referred to as a 'stye' in clinical practice, is one of the most common eye/eyelid conditions reported by the general population.¹⁻³ There are no known age, sex or demographic differences in the prevalence of external hordeola but patients with chronic conditions such as diabetes, dyslipidaemia and seborrheic dermatitis may be at an increased risk.^{4,5}

Patients with an external hordeolum present with an acute-onset red, painful and swollen abscess along the margin of the eyelid. The condition is often self-limiting, lasting 1–2 weeks and can be treated conservatively. If improperly cared for, or just bad luck, rare cases can progress to preseptal or orbital cellulitis, which may result in hospitalisation and ophthalmic and intracranial complications.^{2-4,6,7} Although external hordeola are one of the most common eye/eyelid nodules, there are numerous other eyelid nodules and conditions that should be considered on the differential diagnosis.

ANATOMY/ETIOLOGY

External hordeola originate from an acute staphylococcal infection of the sebaceous glands (Glands of Zeiss) or modified apocrine glands (Glands of Moll) found along the margin of the upper and lower eyelid.^{3,4} Together, the Glands of Zeiss and Moll produce secretions with antibacterial and immune defence properties.^{1,4,8} The Glands of Zeiss secrete into a duct at the base of the eyelash hair follicle, while the Glands of Moll secrete directly to the eyelid surface next to the base of the eyelashes and anterior to the meibomian glands.⁸ When the glands become blocked, or if stasis occurs, bacterial proliferation and infection can occur. As the infection results in a localised inflammatory response, a purulent and palpable abscess will form along the eyelid margin at the base of the eyelashes.⁴ *Staphylococcus aureus* is the most common bacterial culprit in external hordeolum formation.^{3,9}

It is important to note that an external hordeolum differs from an internal hordeolum, which maintains its name in clinical practice. Internal hordeola arise from the meibomian glands, which are modified sebaceous glands found in the tarsal plate of the eyelids; they are responsible for secreting

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an oily substance that aids in lubrication of the eyelid.^{2,3,10} With meibomian gland dysfunction, stasis and subsequent infection with *Staphylococcus aureus* can also occur. Due to the deeper positioning of the meibomian glands, internal hordeola present with painful swelling within the tarsal plate, and thus, are less defined in their appearance compared to their external counterparts, and they tend to be more painful and longer lasting.^{3,5,11} Conditions associated with internal hordeola include blepharitis, acne rosacea, trichiasis and cicatricial ectropion.¹¹⁻¹³

Chalazia are another form of nodule-forming eyelid lesion that share similarities with hordeola. These non-infectious lesions occur secondary to mechanical obstruction and meibomian gland dysfunction with subsequent stasis and blockage of sebum leading to a lipogranulomatous reaction.^{2,9} A chalazion tends to have an indolent and chronic presentation, and it manifests as a persistent, painless localized nodule within the eyelid or at the eyelid margin [Figure 1].^{2,9}

HISTORY, PHYSICAL EXAM, DIAGNOSIS AND DIFFERENTIAL

The diagnosis of external hordeolum is clinical, so a careful history and physical examination is essential. No diagnostic tests or imaging are required or useful in the diagnosis. Bacterial cultures do not aid in diagnosis, treatment or clinical improvement.²

A focused history should determine the duration of symptoms, any prior lesions and any history of foreign body, ocular trauma, decreased vision, fever or pain with ocular movements. Upon examination, the lesion is characterised by acute-onset erythema, swelling and pain near the upper or lower eyelid margin. Along with an external hordeolum, other lesions that should be considered when examining a patient with a nodule on their eyelid are: Internal hordeolum, blepharitis, chalazion, xanthelasma, molluscum contagiosum, eyelid malignancy, pre-septal and orbital cellulitis.

EXTERNAL HORDEOLUM

The primary symptom of an external hordeolum is localised pain and tenderness on one eyelid; this may be preceded by generalised edema and

erythema of the eyelid in some cases.^{2,3,9} The infection is typically localised and points to the eyelid margin as an inflammatory pustule or papule surrounded by swelling and erythema.^{2,3,9} The lesion will be tender to palpation and the intensity of pain experienced by the patient will be proportionate to the degree of eyelid swelling.³ There should not be any pain in ocular movements, and if there is pain with ocular movements, one must be suspicious of ocular cellulitis [Figure 2].

INTERNAL HORDEOLUM

An internal hordeolum typically presents with more diffuse tenderness and erythema. To differentiate an internal hordeolum from an external hordeolum, the patient's eyelid should be everted, so the conjunctival surface can be examined. This can be done by placing a cotton-tipped swab on the outside of the upper lid and gently flipping the lid over the cotton swab.^{2,9} To examine the lower eyelid conjunctival surface, gently grasp the lower eyelid and pull it downwards or ask the patient to do this for you [Figure 3].

A tender pustule or papule directly on the eyelid margin or on the conjunctival surface indicates an internal hordeolum.^{2,3,5,9} In some cases, differentiating between an external and internal hordeolum will not be possible; however, treatment for both infections is generally the same.^{2,9}

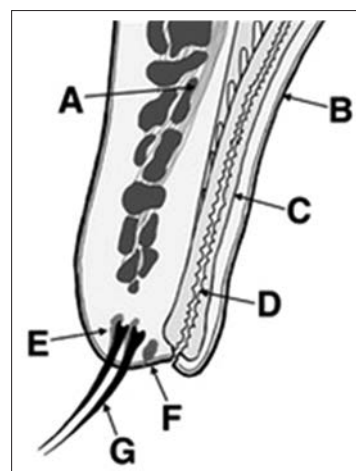


Figure 1: Eyelid gland anatomy. (a) Orbicularis oculi, (b) Tarsal conjunctiva, (c) Tarsum, (d) Meibomian gland, (e) Gland of Zeis, (f) Gland of Moll, (g) Eyelash. Adapted from McAlinden, González-Andrades, and Skiadaresi⁵.

BLEPHARITIS

Blepharitis is a related condition which also involves inflammation of the eyelid margin, so it must be considered in the differential diagnosis. Blepharitis is characterised by red and pruritic eyelids, crusting of the eyelids and matting of the eyelashes, conjunctival injection, excessive tearing, photophobia and sometimes flaking of the eyelid skin.² In contrast to an external hordeolum, internal hordeolum and a chalazion, blepharitis does not cause a discrete nodule within the eyelid; however, blepharitis can lead to the development of an internal hordeolum, so the two conditions can occur simultaneously [Figure 4].^{2,12}

CHALAZION, XANTHELASMAS AND MOLLUSCUM CONTAGIOSUM

A chalazion, as opposed to a hordeolum, has a more sub-acute presentation and manifests with a non-tender nodule with no or mild erythema. Chronic skin changes may be present around the underlying nodule.^{2,4} Figure 5 illustrates a left eyelid chalazion with mild erythema. Other non-erythematous and non-tender lesions, including xanthelasmas and molluscum contagiosum, can also present on a patient's eyelids. Xanthelasmas are soft, cholesterol filled, yellow plaques that are associated in middle-aged and older adults, and they are typically associated with hypercholesterolemia.¹⁸ Figure 6 depicts bilateral xanthelasmas. Conversely, molluscum contagiosum is a poxvirus that produces single or multiple small, flesh-coloured papules with a central umbilication; they typically occur in children.¹⁹

EYELID MALIGNANCY

Persistent or recurrent painful nodules or masses may suggest a basal cell carcinoma or rarely, an eyelid sebaceous gland carcinoma, keratoacanthoma, squamous cell carcinoma or melanoma.¹⁹ Basal cell carcinomas account for 85%–90% of all eyelid carcinomas; they are firm, slow-growing, painless and indurated lesions.^{19,21,22} On some occasions, there is associated telangiectasia and eyelash loss.^{21,22} These lesions are most frequently located on the lower eyelid margin, but they can occur elsewhere,

including the medial canthus, upper eyelid and lateral canthus.²³ They occur most commonly in fair-skinned individuals with a history of sun exposure, and research suggests they may be associated with basal cell nevus syndrome or xeroderma pigmentosum.^{21,22} Patients with a

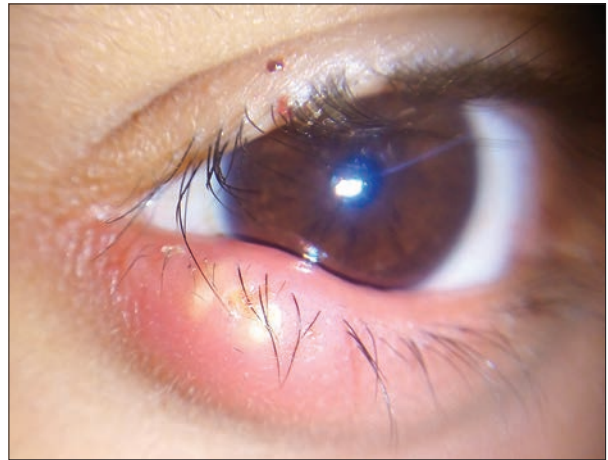


Figure 2: An external hordeolum¹⁴.

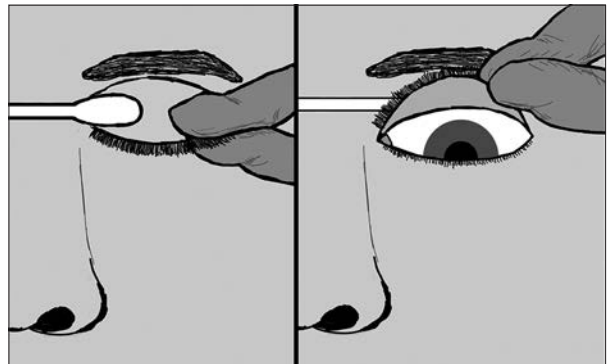


Figure 3: Upper eyelid conjunctival surface examination: grasp the patient's eyelid with a gloved hand (using your thumb and index finger), then twist the cotton tip applicator while everting the patient's eyelid. Based on University of Ottawa, Faculty of Medicine¹⁵.

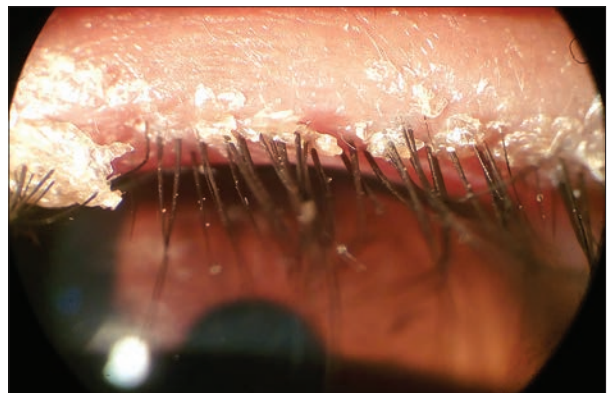


Figure 4: Blepharitis (magnified view)¹⁶.

possible eyelid malignancy should be evaluated with a computed tomography (CT) and punch biopsy, and urgently referred to ophthalmology or plastic surgery.²

PRESEPTAL OR ORBITAL CELLULITIS

Pain during ocular movements, severe periorbital swelling and erythema, or fever are all red flags for possible preseptal or orbital cellulitis.²⁴⁻²⁸ All patients with red flag symptoms need aggressive and urgent investigations and management, including empiric oral antibiotics for preseptal cellulitis, urgent CT and broad-spectrum intravenous (IV) antibiotics for orbital cellulitis²⁴⁻²⁸ Figure 7.

A summary of the above-described eyelid nodules and their respective characteristics is outlined in Table 1.

MANAGEMENT

The external hordeolum is usually a self-limiting condition as lesions often drain spontaneously within 1–2 weeks. If treatment is required, it is primarily conservative. To facilitate drainage and hasten recovery, clean warm compresses can be applied to the lesion several times a day (for 10 min at least 4 times a day), and a gentle massage with clean hands can be applied to the area.^{2,3,9,30} These methods are considered the gold standard for external hordeola management; however, there are no studies confirming their efficacy in shortening the duration of symptoms or improving outcomes.² If the clinician is unsure of whether or not the patient has an external or internal hordeolum, massaging should be used with caution, as massaging an internal hordeolum could irritate the cornea.³¹

Lid scrub with saline or baby shampoo that is tear-free and ph-balanced, may promote lesion drainage by clearing debris from clogged glands and removing bacteria by breaking down cell membranes.^{12,32,33}

Topical erythromycin ophthalmic (0.5%) ointment twice daily for 7–10 days can also be considered during treatment to prevent infection of surrounding eyelash follicles and reduce inflammation.^{2,34} This will not alter the course of the external hordeolum and there is minimal



Figure 5: A chalazion¹⁷.



Figure 6: Xanthelasma (bilaterally)²⁰.



Figure 7: Orbital cellulitis²⁹.

evidence demonstrating a benefit from the use of topical antibiotics.^{2,3} Systemic antibiotics are not indicated for external or internal hordeola.² Oral antibiotics should only be considered if there is progressively worsening or significant surrounding erythema, signs of bacteraemia, if the patient has tender preauricular lymph nodes, or if there is a concern for progression to preseptal cellulitis.^{28,35-37}

If the above-mentioned treatment options fail, minor procedural treatments are indicated. Incision and drainage may be performed in cases where the abscess is pointing (a pustule is present).^{2,9} External incisions may lead to scarring, so making an external eyelid incision is inadvisable, unless there is a visible pustule.⁹ Incision and drainage of the external hordeola can be performed in the primary care office or emergency department. If the provider is not certain whether or not the lesion is fit for incision and drainage, not confident in their ability to incise and drain the lesion, or

Table 1: Overview of the differential diagnosis for an eyelid nodule

Condition	Characteristics
External hordeolum	Localized, erythematous and painful nodule with variable swelling Located on the eyelid margin and points to the eyelid margin as an inflammatory papule or pustule
Internal hordeolum	Diffuse, erythematous and tender nodule with more swelling Located within the eyelid margin and points to the conjunctival
Blepharitis	No discrete nodule Erythematous and pruritic eyelids with eyelid crusting, flaking skin and matting of the eyelashes Ocular features, such as conjunctival injection, photophobia and excessive tearing
Chalazion	Non-tender nodule with no or mild erythema and possible chronic skin changes
Xanthelasma	Non-tender or erythematous Soft, yellow plaques filled with cholesterol often found in middle and older-aged adults
Molluscum contagiosum	Nontender or erythematous Single or multiple small, fleshed-coloured papules with central umbilication
Malignancy	Persistent or recurrent, slow-growing, painless and indurated lesions Can be located anywhere on the eyelid and may be associated with telangiectasia and eyelash loss
Preseptal cellulitis	Ocular pain, tenderness, diffuse, warm, eyelid swelling and erythema with possible chemosis and fever
Orbital cellulitis	Ocular pain, tenderness, diffuse, warm, eyelid swelling and erythema Decreased ocular movements, pain with eye movements, fever and possible decreased visual acuity and proptosis

if they do not have any experience incising and draining eyelid lesions, referral to an optometrist or ophthalmologist may be appropriate.

Alternatively, if the point of the external hordeolum is at the base of an eyelash forming a furuncle, removal of that one eyelash (epilation of the hair follicle) may promote drainage and healing.^{3,34} Epilation should be performed with caution and only the culprit eyelash should be removed.

Internal hordeola can be treated with the same approach as external hordeola.¹¹ They often drain spontaneously within 1 to 2 weeks, and the first-line treatment is conservative: a clean warm compress. Lid scrubs and gentle massage with clean hands can also be used with caution to avoid irritating the cornea. Akin to external hordeola management, if conservative treatment fails, incision and drainage may be performed in cases where the abscess is pointing.^{10,11}

Conservative treatment is also the mainstay of chalazion and blepharitis management. Chalazia can typically be managed by the application of clean, warm compresses several times a day, and if necessary, incision and curettage.^{2,38} Conversely, blepharitis can often be managed by good lid hygiene, which includes warm compresses, lid washing and massage and artificial tears. For patients with blepharitis who do not respond to conservative treatment, or for those with severe

symptoms, topical or oral antibiotics therapy is recommended.^{38,39}

PROCEDURE: EXTERNAL HORDEOLUM INCISION AND DRAINAGE

Equipment

- Sterile gloves and saline-soaked swabs
- 18G needle OR
- Scalpel handle and #11 blade
- Chalazion clamp (if available) or a cotton tip applicator
- Tweezers
- Gauze
- Saline-soaked gauze.

Procedure

- Have the patient lie supine and stand lateral to them on the side of the external hordeolum, so you are comfortable accessing it
- Inspect the lesion to confirm its size, location, presence of a pustule and that it is an external hordeolum and not an internal hordeolum or chalazion. Rule out the signs of cellulitis during inspection
- Cleanse the area with saline soaked swabs
- Use your non-dominant hand to expose the pustule of the external hordeolum. If the external

hordeolum is on the eyelid margin, use the chalazion clamp or a cue tip to evert the eyelid to better expose the external hordeolum. Warn the patient of possible discomfort before everting their eyelid

- Once the external hordeolum's pustule is adequately exposed, ask the patient to remain still and use the point of the needle or scalpel to make a stab incision to the point of the external hordeolum. During the incision, rest the lateral side of your hand on the patient's lateral forehead or cheek to help stabilise your movement. To avoid disrupting eyelash growth do not make an incision directly on the eyelash line
- Once an incision is made, gently massage the external hordeolum with your gloved index fingers or by using one cotton tip applicator and an index finger to express the abscess. It may be necessary to make an additional incision if no drainage occurs, especially for a larger external hordeolum
- Gently remove any drained purulent material or blood with a piece of dry gauze
- Following drainage, provide the patient with saline-soaked gauze and ask them to compress the lesion for 5–10 min.

EPILATION

Equipment

- Tweezers
- Gauze
- Saline-soaked gauze.

Procedure

- Follow steps 1–4 as described above. Ensure the pustule is at the base of an eyelash follicle
- Once the external hordeolum pustule is adequately exposed, ask the patient to remain still and use the pair of tweezers to remove the culprit eyelash. While doing so, rest the lateral side of your hand on the patient's lateral forehead or cheek to help stabilise your movement. Only remove the one eyelash
- Follow steps 5–7 as described above.

POST-PROCEDURE MANAGEMENT

Instruct the patient to continue applying a warm compress to the external hordeolum for 10 min

at least four times a day until inflammation and swelling resolves. Communicate potential complications (below) with the patient before discharge. Re-evaluate the patient again within 48–72 h to ensure that healing is taking place.²

COMPLICATIONS

Potential complications during incision and drainage include bleeding and damage to surrounding structures. The procedure should be performed with caution to avoid inadvertent contact with structures other than the external hordeolum, namely the cornea.

Although uncommon, an untreated or poorly treated external hordeolum (i.e., incomplete drainage) may progress to localised cellulitis on the eyelid or surrounding skin.^{2,4} If the infection is allowed to progress, preseptal or orbital cellulitis can ensue. Mild preseptal cellulitis, which is characterised by swelling and erythema extending beyond the external hordeolum with no signs of systemic toxicity, can usually be managed rapidly in the outpatient setting with empiric oral antibiotics and close follow-up. There is a lack of randomised trials of antibiotic regimens for preseptal cellulitis, but the following combination regimens have been suggested: Trimethoprim-sulfamethoxazole or clindamycin with amoxicillin, amoxicillin-clavulanic acid, cefpodoxime or cefdinir.⁴⁰

Preseptal cellulitis typically demonstrates a quick response with appropriate antibiotic therapy and patients should be re-evaluated in 24–48 h.³⁴ Unresponsive or worsening preseptal cellulitis and/or signs of more significant infection, including severe swelling and erythema extending beyond the external hordeolum, fever, tender preauricular lymph nodes, painful ocular movements and proptosis warrant re-evaluation.^{2,4,34} Complete blood count with differential and culture may be required, and if there are signs of orbital cellulitis, an orbital CT scan may be needed.³⁴ In these cases, hospitalisation and prompt treatment with broad-spectrum IV antibiotics are required.^{35–37} The initial antibiotic treatment includes a combination of vancomycin and ceftriaxone or cefotaxime.⁴⁰

CONCLUSION

Patients with eyelid nodules may present to the emergency department or primary care clinic.

The majority of painful nodules will be hordeola that can be managed conservatively with daily intermittent warm compress; however, lid scrubs, antibiotic ointments, incision and drainage or epilation are all options in the management repertoire. If there is any doubt of the diagnosis, the patient should be referred to an optometrist or ophthalmologist. Preseptal or orbital cellulitis should always be considered and managed accordingly during evaluation, diagnosis and treatment.

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