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A case of managing a hordeolum.

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Abstract

A hordeolum is a common infection of the eyelid margin. Lesions appear as a red, swollen nodule that resembles a pimple in appearance. The infection may be on the external or internal surface of the eyelid and could lead to redness and edema of the lid. Recognition of these lesions requires an understanding of eyelid anatomy. The objective of this case is to review etiology of these lesions and appropriate treatment.

Keywords: External *Hordeolum, Internal Hordeolum, Hordeola, Chalazion, Chalazia, Blepharitis, Eyelid, Redness, Swelling.*

Introduction

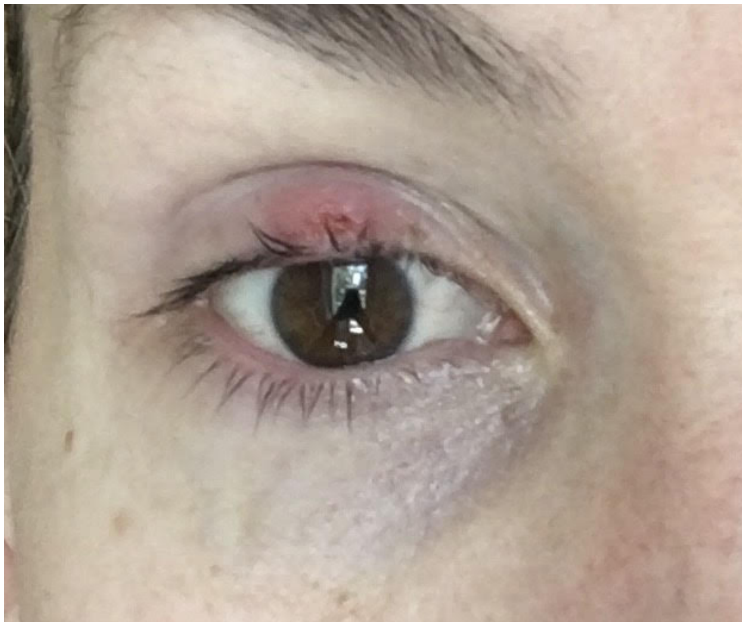
The eyelid consists of a number of oil-produced glands, known as meibomian glands, that are responsible for keeping the ocular surface lubricated. There are approximately 20-25 glands along the lower eyelid and approximately 30-40 along the upper eyelid (1). The function of these glands can often be disrupted by hordeola. And the disruption of one gland could lead to a disruption of surrounding tissues and glands; which can further exacerbate the problem. Eyelid disorders are among the most common anomalies encountered by eyecare professionals. As a result of eyelid disorders often being associated with significant symptoms, adjacent tissue involvement or even systemic manifestations, it is important for clinicians to be able to recognize and treat these disorders appropriately.

Case Report

A 39-year old caucasian female presented for an office visit with complaints of a red, swollen, painful (3/10) lesion along her right upper eyelid. The onset of the lesion was 3 days ago and appeared to be getting worse. The lesion was painful to touch. No changes in vision, discharge, or use of new cosmetics or other products were reported. She was not ill and had no fever. Last eye examination was over 10 years ago. Ocular and family ocular history were unremarkable and no spectacle or contact lens history exists. No medications or drug allergies were reported. Blood pressure was not measured The patient was not pregnant and oriented to time, place and person. Her uncorrected distance visual acuity was 20/20 in OD and 20/20 OS.

Non-contact tonometry measured 10mmHg OD, 10mmHg OS at 1:25pm. Anterior segment evaluation was performed using a slit lamp biomicroscope. The adnexae, puncta, bulbar conjunctiva, palpebral conjunctiva, cornea, iris and lens were normal in both eyes. The upper and lower eyelashes of both eyes presented with moderate blepharitis of upper and lower eyelids and the lid margin contained moderate meibomian gland dysfunction. A few meibomian glands at the base of the lesion were potentially occluded; no meibum excretion was appreciated with manual expression. The right upper eyelid contained a well-defined, red, elevated lesion near the lid margin. The lesion was within the tarsal plate and originated from the base of the meibomian gland. It was about 6mm round in size with no involvement of the underlying palpebral conjunctiva was noted with upper lid eversion. Anterior chamber of both eyes were quiet without evidence of cell or flare and angles were 4/4 via the Van Herick method. Pupils were equally round and reactive to light, no afferent pupil defect was noted OU. No pupil dilation was performed. Posterior segment evaluation was performed using a slit lamp biomicroscopy with a 90D lens. Fundus assessment revealed optic nerves with a cup-to-disc ratio of 0.30/0.30 OD and OS. The cups were shallow; there was no evidence of pallor or edema or the neuroretinal rim. Both macula’s were flat and evenly pigmented. The vitreous was clear and the vasculature was normal in both eyes. Retinal periphery evaluation was not performed.

Figure 1 (initial presentation)



The differential diagnosis at this point included:

- Preseptal cellulitis
- Hordeolum
- Chalazion
- Sebaceous carcinoma
- Pyogenic granuloma

Preseptal cellulitis is an infection of the eyelid anterior to the orbital septum. It typically presents as acute diffuse eyelid redness and swelling. Typically unilateral and painless. The conjunctiva and extraocular muscle movements remain normal. Vision is typically not affected. Patients may present with a history of malaise or fever.

Hordeolum typically presents as an acute, well-defined, red, sometimes painful, swollen lesion along the eyelid margin. Lesions can present unilaterally or bilaterally, are tender to touch and can often be attributed to underlying lid hygiene and lid margin disease. Chronic hordeola can lead to chalazia formation. The conjunctiva remains normal. Vision is typically not affected.

Chalazion is an acute, well-defined, non-infectious, inflammatory mass within the midportion of the eyelid. Chalazia present as a subcutaneous nodule or swelling of the eyelid or conjunctiva. They tend to present for longer than the natural history of hordeola. They may slowly grow in size and can present unilaterally or bilaterally. Patients may complain of irritation or foreign body sensation depending on the size and vision is typically unaffected.

Sebaceous carcinoma is a rare, highly malignant tumor of sebaceous glands, including meibomian glands. The lesion occurs more often in the upper eyelid and more commonly affects middle-aged or elderly patients. It typically has two main presentations; nodular and spreading. The nodular form is hard, discrete, immobile nodule and yellow in appearance. The spreading presentation occurs in a pagetoid form with diffuse intraepithelial infiltration of the lid. Causing diffuse thickening of the lid margin and loss of lashes. It can spread to both eyelids and conjunctiva.

Pyogenic granuloma is a benign inflammatory lesion that presents as a red, smooth, superficial, pedunculated and vascular mass within the conjunctiva. These lesions occur in response to minor trauma to the conjunctiva; such as provoking tissue insult from trauma or surgery. Less commonly, they can occur idiopathically. They can rapidly grow in size and are prone to bleeding. They are not malignant in nature and typically present unilaterally. Patients may complain of irritation or foreign body sensation. Vision is typically not affected.

The appearance of the eyelid lesion in the right eye suggests a diagnosis of a hordeolum based on the following; the presence of an acute, well-defined, tender, elevated, red lesion within the eyelid margin. In addition, the patient was symptomatic of pain with and without palpation and pre-existing lid margin disease was present. The location of the lesion was within the tarsal plate and not originating from the base of the lashes. Furthermore, no conjunctival involvement was noted and there was no evidence of lash loss. The patient was not ill and had no fever. The patient was treated initially in-office with Ocusoft lid scrubs OU, followed by warm compress OU and upper eyelid massage OD. The patient prescribed Ocusoft lids scrubs BID OU along with daily warm compress with Thermalon mask TID OU, for at least 10 minutes each time, followed by gentle massage of hordeolum OD. The patient was advised to return to the clinic urgently should any symptoms of fever, severe pain or diplopia present. The patient was scheduled to return for follow up in 1 week.

Follow up #1

The patient returned in 1 week for an anterior segment evaluation. The patient reported good compliance with treatment. The patient reported no pain or discomfort and felt the redness and swelling had improved mildly too. Visual acuity remained stable with uncorrected distance acuity of 20/20 OD and 20/20 OS. Slit lamp biomicroscopy of both eyes revealed normal adnexae, bulbar conjunctiva, palpebral conjunctiva, cornea and irides. Trace blepharitis was present bilaterally but moderate meibomian gland dysfunction still remained. Minimal meibum was excreted with expression. The hordeolum OD clinically showed improvement; approximately 30% smaller in size compared to baseline. No AC reaction was present OU. Non-contact tonometry measured 10 mmHg OD, 11 mmHg OS at 9:30am. Posterior segment evaluation was deferred in both eyes. The patient was advised to continue the same treatment as initially advised. The patient was scheduled to return for follow-up in 3 weeks.

Follow up #2

The patient returned in 3 weeks for an anterior segment evaluation. The patient reported good compliance with treatment. The patient reported no discomfort or no redness OD. The patient's symptoms had resolved and noticed no redness along upper eyelid OD. Visual acuity remained stable with uncorrected distance acuity of 20/20 OD and 20/20 OS. Slit lamp biomicroscopy of both eyes revealed normal adnexae, lashes, bulbar conjunctiva, palpebral conjunctiva, cornea and irides. The hordeolum OD resolved and no residual swelling or redness was appreciated. Meibomian gland dysfunction was also improved and better excretion of meibum was appreciated compared to baseline and previous follow up. No AC reaction was present OU. Non-contact tonometry measured 10 mmHg OD, 10 mmHg OS at 1:00pm. Posterior segment evaluation was deferred in both eyes. The patient was advised to continue using lid scrubs OU and warm compress OU once daily for maintenance. The patient was doing well and no follow up was scheduled.

Discussion

As thin as the eyelids are, it is a complex tissue that consists of eyelashes, tear (lacrimal) glands, sebaceous (meibomian) glands and sweat (glands of Zeis or Moll) glands (5). When these structures develop infections or inflammatory reactions, it can lead to a red, swollen eyelid. Microbiomes can naturally live on and inside our bodies; and the eyelid is no exception. The ocular microbiome is relatively small, but microbiome imbalances may increase risk of ocular surface diseases (3). Hordeolum is a common, painful, swelling of the eyelid margin caused by a bacterial infection (2). Bacterial flora found on the ocular surface consists of Staphylococcus, Streptococcus, Propionibacterium and Corynebacterium (3). 90% to 95% of cases of hordeolum are due to Staphylococcus aureus (4). Staphylococcus epidermidis being the second most common cause (4).

While hordeola are one of the most common diseases of the eye, many people can be affected. Every age and demographic can be affected, but there is a slight increase in patients aged between 30 to 50 (4). Patients with chronic conditions such as seborrhoeic dermatitis, diabetes and high serum lipids may be at increased risk of hordeola (4,6). Other risk factors include blepharitis, acne rosacea, meibomian gland dysfunction, trichiasis and ectropion (4,10,11). The size of the lesion is often a director indicator of the severity of the infection (7).

The eyelid contains three different glands and each of them can be implicated in the pathogenesis of a hordeolum when they become infected by S. aureus. There are two forms of hordeolum; internal versus external. An external hordeolum is an infection of the external (Zeis or Moll) sweat gland and it produces a red swollen area at the base of the lash line which develops into a pustule. An internal hordeolum is an infection of the internal sebaceous (meibomian) gland and a pustule forms within the tarsal plate of the eyelid. Internal hordeolum typically is more painful and longer lasting than external hordeolum (8). Hordeola can occur on both the upper and lower eyelids (9).

The diagnosis of a hordeolum can be made with a case history and physical exam. No diagnostic tests are needed. Many patients with acute symptoms can heal without any intervention. Majority of cases of acute hordeola resolve on their own without treatment (2,10). Depending on how advanced the hordeola is at presentation, initial recommendation is a trial of non-invasive conservative management (2,10,12). Conservative management includes one or a combination of frequent warm compresses, massage of the lesion and lid scrubs. Frequent warm compresses are intended to soften the granulomatous tissue and facilitate drainage. Lid massages are aimed to help express any purulent drainage from any infected glands. Lid scrubs could promote drainage by clearing debri from any clogged gland. In addition, the soap component within the lid scrubs may help break down cell membranes and any blepharitis. If no improvement with conservative management is noted, a short course of antibiotic therapy can be used for lesions that are persistent, larger in size or have associated blepharitis (13). Consider systemic therapy with doxycycline 100mg BID for one to two weeks, and erythromycin ung one to two times per day in cases with concomitant blepharitis (2,10,14). Doxycycline is recommended because of it's combined antibacterial and anti-inflammatory property (13). The side effects of doxycycline include stomach upset, sensitivity to sunlight, diarrhea and rash. Doxycycline is contraindicated for pregnant women and children under the age of eight. Other systemic antibiotics that can be considered are cephalexin, augmentin and erythromycin. Both cephalexin and augmentin have a good spectrum of bacterial coverage and are easily accessible (13,17,18). Augmentin is indicated for preseptal cellulitis (13). For patients that are allergic to penicillins, macrolides such as erythromycin are indicated (13). These can help to shorten duration and severity of the hordeola. Both topical and oral formulations can be used, however oral formulations are more effective for internal hordeolum since the infection occurs within the tarsal plate. For persistent lesions, incision and drainage may be performed (15,16). Side effects may include pain, bleeding, lid deformity, lash loss and lid fistula. On the other hand, while steroid injection is an effective treatment for chalazion, they should not be given for hordeolums given their infective nature. A hordeolum may mimic a chalazion but it is important for clinicians to recognize conditions, such as hordeola, in which steroid injection should not be performed (15).

Conclusion

A hordeolum is a common presentation in primary eye care. The well-defined mass at the lid margin can make these lesions relatively easy to diagnose but careful understanding of the anatomy of the lesion guides diagnosis and urgency. The acute pain and cosmetic presentation often drive patients for urgent office visits. Majority of patients can heal with conservative management alone.

References

1. *Bron AJ, Tiffany JM. The meibomian gland and tear film lipids: structure, function and control. Adv Exp Med Biol. 1998;438:281–295.*
2. *Lindsley, Kristina, et al. “Interventions for Acute Internal Hordeolum.” The Cochrane Database of Systematic Reviews, U.S. National Library of Medicine, 8 Sept. 2010.*
3. *“Microbiome of the Eye.” American Academy of Ophthalmology, 27 Mar. 2019, www.aao.org/eye-health/anatomy/microbiome-of-eye.*
4. *Willmann, Davis. “Stye.” StatPearls [Internet]., U.S. National Library of Medicine, 29 Jan. 2020.*
5. *Carlisle RT, Digiovanni J. Differential Diagnosis of the Swollen Red Eyelid. Am Fam Physician. 2015 Jul 15;92(2):106-12.*
6. *Moriya K, Shimizu H, Handa S, Sasaki T, Sasaki Y, Takahashi H, Nakamura S, Yoshida H, Kato Y. Incidence of Ophthalmic Disorders in Patients Treated with the Antineoplastic Agent S-1. Gan To Kagaku Ryoho. 2017 Jun;44(6):501-506.*
7. *Lebensohn 1950. Lebensohn JE. Treatment of hordeola. Postgraduate Medicine. 1950;7(2):133.*
8. *Olson 1991. Olson MD. The common stye. Journal of School Health. 1991;61(2):95–7.*
9. *Takahashi Y, Watanabe A, Matsuda H, Nakamura Y, Nakano T, Asamoto K, Ikeda H, Kakizaki H. Anatomy of secretory glands in the eyelid and conjunctiva: a photographic review. Ophthalmic Plast Reconstr Surg. 2013 May-Jun;29(3):215-9.*
10. *Lindsley, Kristina, et al. “Non-Surgical Interventions for Acute Internal Hordeolum.” The Cochrane Database of Systematic Reviews, John Wiley & Sons, Ltd, 9 Jan. 2017.*
11. *Machalińska, Anna, et al. “Risk Factors and Symptoms of Meibomian Gland Loss in a Healthy Population.” Journal of Ophthalmology, Hindawi Publishing Corporation, 2016,*
12. *Bragg, Kara J., et al. Hordeolum. StatPearls Publishing LLC, Jan. 2020.*
13. *The Wills Eye Manual: Office and Emergency Room Diagnosis and Treatment of Eye Disease, 7th Edition. (Philadelphia, Pa.) Wills Eye Hospital, et al. Lippincott, Williams & Wilkins, 2017.*
14. *Blepharitis Preferred Practice Pattern, Amescua, Guillermo et al. Ophthalmology, Volume 126, Issue 1, P56 - P93.*
15. *Lee, Jack, et al. “A Comparison of Intralesional Triamcinolone Acetonide Injection for Primary Chalazion in Children and Adults.” The Scientific World Journal, Hindawi, 15 Oct. 2014.*
16. *Marren SE, Bartlett JD, Melore GG (2001) Diseases of the eyelids. In: Bartlett JD, Jaanus SD (eds) Clinical Ocular Pharmacology 4th ed. ButterworthHeinemann, Boston, p. 485-522.*
17. *Ki, Vincent, and Coleman Rotstein. “Bacterial Skin and Soft Tissue Infections in Adults: A Review of Their Epidemiology, Pathogenesis, Diagnosis, Treatment and Site of Care.” The Canadian Journal of Infectious Diseases & Medical Microbiology = Journal Canadien Des Maladies Infectieuses Et De La Microbiologie Medicale, Pulsus Group Inc, Mar. 2008.*
18. *“Prescribe Oral Antibiotics When Internal Hordeola Do Not Respond to Topical Therapy.” Healio, Sept. 2017, www.healio.com/news/optometry/20120225/prescribe-oral-antibiotics-when-internal-hordeola-do-not-respond-to-topical-therapy.*