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The Management of Chalazia: Avoiding Bumps in the Road to Recovery

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A chalazion is a chronic lipogranuloma of the eyelid, and is one of the most commonly encountered lesions in ophthalmology. As such, all ophthalmologists should be able to appropriately manage or triage chalazia. Many benign and malignant lid lesions may mimic chalazia, most notably basal cell carcinoma and sebaceous carcinoma. Although the care of most chalazia is straightforward, clinicians should remain diligent with management. This issue of *Ophthalmology Rounds* reviews the differential diagnosis of chalazia, the treatments alternatives for chalazia, and potential complications of treatment.

The ocular adnexal oil glands (sebaceous glands) include the meibomian glands in the tarsal plate, and the glands of Zeis associated with the eyelash follicles. A chalazion (Greek for "hailstone") is a chronic localized lipogranulomatous inflammation of the sebaceous glands of the eyelid, presumably due to duct obstruction. Chalazia can occur at any age and be painful or indolent. There is often a previous history of chalazion as these lesions tend to be recurrent.

Blepharitis, rosacea, and dry eye symptoms frequently accompany chalazia (Figure 1). Hypercholesterolemia may contribute to meibomian gland dysfunction.¹ Viral conjunctivitis, ocular demodicidosis, posaconazole, hyperimmunoglobulin E (Job) syndrome, topical prostaglandin analogues, gastritis, anxiety, irritable bowel syndrome, and smoking are possible risk factors for chalazia.²⁻⁷ Furthermore, human immunodeficiency virus-positive patients who received highly active antiretroviral therapy may have a greater incidence of chalazia and arcus senilis.⁸

Chalazia can cause vision loss due to induced astigmatism or hyperopia,⁹ ptosis and unstable tear film. Chalazia in young children are potentially amblyogenic.¹⁰ In patients who have undergone laser-assisted *in situ* keratomileusis, chalazia may cause external compression-induced curvature changes due to decreased corneal thickness and rigidity.¹¹

On physical examination, chalazia may have varied appearances. Inspissated meibomian glands and lid erythema are commonly seen. In general, there should not be lash loss. Granulation tissue may be apparent on lid eversion, especially if there is a history of chalazion rupture. Exclude accompanying facial or ocular rosacea.

Chalazia usually do not harbour infectious material but may contain lipid breakdown products (free fatty acids), possibly from bacterial enzymes.¹² Chalazia can resolve spontaneously, wax and wane, or rupture posteriorly with the appearance of granulation tissue (Figure 2).

Exuberant granulation tissue or "pyogenic granuloma" from the conjunctiva can accompany a chalazion and manifests as an erythematous, friable, rapidly growing lesion that can bleed. Granulation tissue is thought to be a proliferative fibrovascular hyperplastic response to tissue insult, with resultant angiogenic stimulus.

Differential Diagnosis

The accuracy in the diagnosis of chalazia among oculoplastics surgeons was 93.3% sensitive and 100% specific in one study.¹³ In a separate series of 1033 presumed chalazia,

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Figure 1: Multiple chalazia in a patient with rosacea.



6.4% of the cases were misdiagnosed and 1.4% were malignancies.¹⁴ These findings underscore the need for pathology, especially in recurrent cases.

Because chalazia are so common, they can be misdiagnosed as other benign or malignant lid lesions (Figures 3-5). Other inflammations, foreign bodies, and iatrogenic problems may mimic chalazia. The broad differential diagnosis for chalazia is outlined in Table 1. Based on results of a limited (N=6 patients) retrospective, interventional, clinico-pathological study, Jakobiec¹⁵ reported that meibomian gland keratinous cysts appear to be the third most common primary intratarsal lesion after chalazia and sebaceous gland tumours. Findings suggestive of a diagnosis of a meibomian gland keratinous cyst include anterior fixation to the tarsus and posterior protrusion beneath the palpebral conjunctiva without inflammation.

Lacrimal gland stones have been recently described as an alternative diagnosis to a superolateral chalazion, and should be considered when there

Figure 2: Granulation tissue (lobular capillary hemangioma or "pyogenic granuloma") following chalazion.

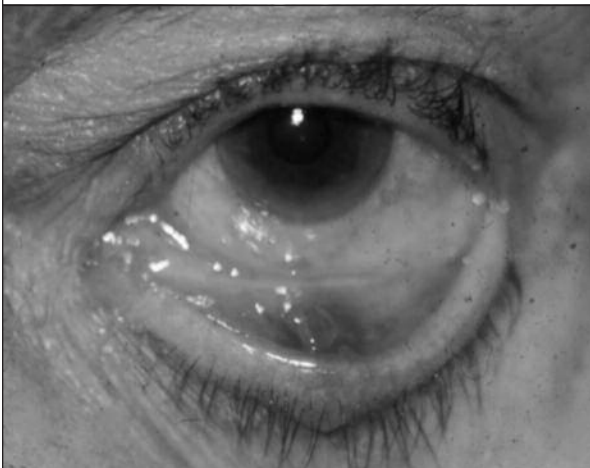


Figure 3: Pilomatrixoma mistaken for chalazion.



is an intractable chalazion-like mass, or conjunctivitis near the lateral canthus, beyond the tarsal plate.¹⁶

Basal cell carcinoma and sebaceous carcinoma are common malignant mimics of a chalazion. Any nonhealing ulceration or recurrent lid lesion that disrupts the lid margin architecture should be considered suspect and biopsied accordingly. In particular, sebaceous carcinoma may show yellowish thickening of the lid yellow thickening of the eyelid, and conjunctival involvement.

Investigation and Pathology

The most important investigation in a patient with suspected chalazion is pathologic confirmation. It is the author's preference to send all specimens to pathology, unless only a fluid discharge is obtained. If the curettage specimen is scant, deeper biopsy with scissors can be performed. It is mandatory to obtain pathology if the lesion appears atypical, is recurrent and unilateral, or if the specimen is markedly indurated, in which case scissors may be required to obtain a specimen.

Pathologic samples of chalazion typically show a mixture of acute and chronic inflammatory cells with large lipid-filled foreign body giant cells surrounding clear spaces (Figure 6); the spaces are the result of dissolution of lipids by solvents during routine tissue processing. Bacterial cultures of the biopsied material are usually negative, but the pathologist may perform

Figure 4: Rapidly enlarging Merkel cell referred as "chalazion" in its early stage.



Table 1: Differential diagnosis of chalazia

Benign lesions

- Intratarsal keratinous cysts of the meibomian gland (sebaceous duct cyst)¹⁵
- Sebaceous tumours
- Pilomatrixoma
- Trichilemmal cyst
- Neurofibroma
- Nerve sheath myxoma (neurothekeoma)
- Hemangioendothelioma
- Leiomyoma
- Osseous metaplasia
- Lacrimal gland duct stone¹⁶
- Arteriovenous fistula (secondary to eyelid chalazion during pregnancy)
- Orbital angiolymphoid hyperplasia with eosinophilia

Metastatic lesions

- Breast cancer
- Lung cancer
- Renal cell carcinoma
- Signet-ring cell/histiocytoid carcinoma
- Gastric carcinoma
- Leiomyosarcoma of the esophagus
- Pleural mesothelioma

Primary malignant lesions

- Sebaceous carcinoma
- Merkel cell carcinoma
- Malignant melanoma
- Mucinous sweat gland adenocarcinoma
- Eccrine adenocarcinoma
- Adenoid cystic carcinoma
- Peripheral T-cell lymphoma
- Eosinophilic granuloma (pre-malignant?)

Inflammation and infection

- Sarcoidosis
- *Actinomyces*
 - Canalculitis
 - Paracanalicular abscess
- Atypical mycobacteria
- Rhinosporidiosis
- Sporotrichosis
- Leishmaniasis
- Lymphomatoid contact dermatitis

Foreign body

- Retained soft contact lens
- Migrating sclera explant
- Iatrogenic
- Budesonide-induced periorificial dermatitis
- Posaconazole

stains for tuberculosis or fungal organisms if lipogranulomatous inflammation is seen.

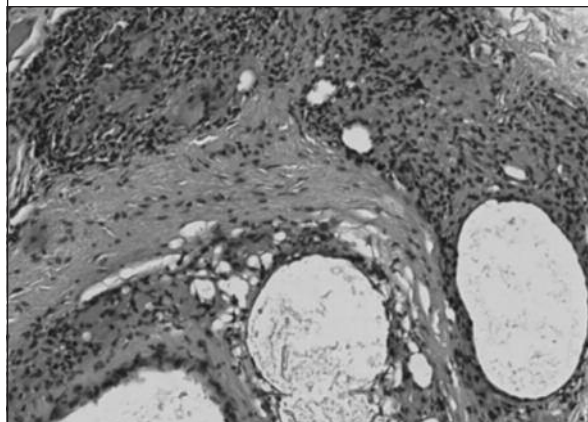
Investigations for chalazion other than pathology are not mainstream. Bacterial cultures are usually negative. Consideration can be given to testing serum lipids. Meibomian gland transillumination and an infrared

camera,¹⁷ and keratography¹⁸ have been described for imaging of the meibomian glands, but may not offer more clinical utility than slit lamp examination and digital expression of meibomian secretions. Ultrasound biomicroscopy is not yet reliable in the differential diagnosis of chalazion,¹⁹ and pathology is required.

Figure 5: Sebaceous carcinoma with yellowish conjunctival deposits on lid eversion.



Figure 6: Pathology of chalazion: Lipogranulomatous inflammation with cohesive clusters of epithelioid histiocytes and multinucleate giant cells (top), surrounding lipid vacuoles (below). H&E stain. Courtesy of Dr. Anita Godra.



Treatment

Approximately 50% of chalazia spontaneously resolve or improve within 1 month with medical treatment alone.²⁰ Spontaneous improvement or resolution of chalazion has been documented to take as long as 3–5 years.²¹ Traditional medical treatments include warm compresses, lid massage, lid scrubs, and topical steroids. No dietary therapy has been proven efficacious for chalazion, although a reduced cholesterol diet may affect meibomian gland dysfunction. Anecdotal evidence suggests avoidance of dairy products may decrease chalazia.

Oral doxycycline in dosages as low as 100 mg per week may be of use in adult patients with rosacea, marked meibomian gland dysfunction and recurrent, multiple chalazia. The anti-inflammatory effect of doxycycline in treating these diseases has been ascribed to inhibition of matrix metalloproteinase (MMP) activity and both MMP and interleukin-1 (IL-1) synthesis.²² It is thought that doxycycline may allow the sebaceous glands to produce shorter-chain fatty acids, which are less likely than longer-chain fatty acids to congeal and block the gland orifices.¹²

Procedural interventions for chalazia include incision and curettage, intralesional steroids, and subconjunctival total excision.²³

Incision and curettage

Incision and curettage is the classic therapeutic approach for a chalazion. Whenever possible, chalazia are approached from the conjunctival side with the lid everted for better cosmesis. The technique used by the author is similar to that described by Unal.²⁴ Topical anesthetic drops and a cornea protector are positioned. Some clinicians will add lidocaine 2% gel to the eye.²⁵ The cutaneous projection of the chalazion can be identified with a pen or marker. Local anesthetic (1–2% lidocaine with 1:100 000 epinephrine) is infiltrated around the chalazion. The author has found that 1.5 cc of local anesthetic through the anterior lamellae provides sufficient analgesia without the need for conjunctival injection. The open ring of the chalazion clamp is centred over the conjunctival aspect of the lesion, and the eyelid is everted. A scalpel blade is used to make a vertical incision into the tarsus (Figure 7). The use of a 25-gauge needle to make the tarsal incision for incision and curettage has been suggested to be superior to a scalpel.²⁶ A chalazion curette is used to scrape out the contents of the cyst, which are sent to pathology. If a fibrous capsule is present around the chalazion, it can be excised with scissors. The clamp is loosened, and some clinicians choose to cauterize any bleeding points. Antibiotic steroid ointment is applied. The eye can be patched for 30 minutes until bleeding is controlled. A tissue adhe-

Figure 7: Incision and curettage. The lid is everted with chalazion clamp and a vertical slit incision is made. The contents of this longstanding chalazion had a fluid-like consistency.



sive may be used as a hemostatic agent for chalazion excision in patients with hemophilia.²⁷

During incision and curettage of larger chalazia, multiple tarsal vertical “slats” spaced 1 mm apart will not compromise the meibomian glands as much as a horizontal tarsal incision.²⁸ If a cutaneous approach is required for a predominantly anterior-pointing chronic chalazion, an eyelid crease incision may afford better cosmesis, rather than incising directly over the lesion.²⁹ If chalazia are close to the punctum, steroid injection may be preferable to incision. If surgery is required, a bent Bowman probe can be positioned to guard the canaliculus during incision and curettage. Occasionally canaliculitis may be mistaken for a peripunctal chalazion.

Patients should be informed to return to the office within a month of the incision and curettage if the lesion has not satisfactorily resolved. Pathology results should be reviewed for any unresolved chalazion. If repeat incision and curettage is contemplated, it can be combined with intralesional steroid injection. As an alternative to incision and curettage, subconjunctival total excision of the chalazion can be performed.²³

Intralesional steroids

Intralesional steroids may be advantageous for chalazia close to the lid margin, near the canaliculi, and for patients who are allergic to local anesthetic. Intralesional injection of triamcinolone acetonide (eg, 0.1–0.2 mL of 10 or 40 mg/mL suspension) is not only quicker than incision and curettage, but may also be more comfortable and as effective as this procedure.^{30–32} In patients with nonresolving or recurrent chalazion, steroid

injections can be repeated; however, strong consideration should be given to confirming the pathologic diagnosis. Cytopathology of aspirated specimen, prior to steroid injection has been suggested as an alternative to conventional pathology.³³ If cytopathology shows predominantly suppurating granuloma with epithelioid cell granulomas with numerous neutrophils in a proteinaceous background, intralesional steroids may not work as well.³³

Some granulation tissue lesions may respond to topical steroids alone. However most granulation tissue lesions are shave excised under topical anesthetic followed by topical steroid ointment for 1-2 weeks.

Less common treatment options

Less conventional treatments for chalazion have been described. Tea tree oil and shampoo have been suggested for the blepharitis or demodicosis associated with some chalazia.³⁴ Botulinum toxin A injection (2-5 IU)³⁵ and cryotherapy³⁶ are not mainstream treatments for chalazion. A commercially available intraductal probe is available to probe meibomian glands in patients with dry eye, but the manufacturers have not advocated its use for chalazia.³⁷

Complications of Chalazion Treatment

Although interventions for chalazion are usually straightforward, the patient and clinician should not be lulled in to a false sense of security.³⁸ Any treatment for chalazion has potential complications, including eyelid burns following warm compresses prepared in the microwave.³⁹ Topical or injected steroids may predispose to cataracts, glaucoma and reactivation of herpes simplex. Steroid injections can cause depigmentation, and are generally avoided in patients with dark skin, with few exceptions.²⁴ Injections of local anesthetic or steroid for chalazia may cause corneal penetration, traumatic cataract, anterior segment ischemia, retinochoroidal vascular occlusion or steroid embolism.⁴⁰⁻⁴² Hemorrhage following chalazion removal occurs and may be delayed as long as ten days.^{43,44} Silver nitrate, used in the past for hemostasis following chalazion surgery, can cause corneal injury.⁴⁵ A case of orbital apex syndrome from bacterial infection that occurred 2 weeks after chalazion surgery has been reported in an immunocompromised patient.⁴⁶

Summary

Chalazia are chronic lipogranuloma, and are one of the most common lid lesions. The differential diagnoses of chalazia include many benign and malignant lesions. Lid eversion is an important part of the clinical examination. Pathology of biopsy

specimens is suggested whenever feasible, and deeper biopsy is recommended if the curettage specimen is scant.

The treatment of chalazia is usually straightforward, although the lesions have a tendency to recur. All procedural treatments should be performed with care to prevent potential vision-threatening sequelae.

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