PEER REVIEWED

Bowen’s Disease of the Eyelid

Zainab A. Muhanna, OD, Angelina Tran, OD, FAAO, and Bhagya Segu, OD, MPH, FAAO

Abstract

Bowen’s disease (BD), also known as squamous cell carcinoma in situ, is a precancerous skin lesion confined to the epidermis. BD is more prevalent in women and primarily affects individuals of Caucasian and Asian descent between the sixth and ninth decade of life. Lesions are slow-growing, non-pigmented and patchy in appearance, and they arise in areas with frequent sun exposure, such as the face, head and neck. BD is managed surgically in most cases, but topical interventions are also available. This report reviews a case of Bowen’s disease of the eyelid in a 76-year-old Caucasian male and summarizes clinical characteristics of BD.

Key Words: *Bowen’s disease, squamous cell carcinoma in situ, wide-local excision, oculoplastics, dermatology*

Background

This case report reviews the clinical manifestation of Bowen’s disease (BD) in a patient who presented to the eye clinic with a chief complaint of a “bump” on his eyelid. BD (ICD-10: D09.22), also known as squamous cell carcinoma in situ, is a precancerous skin lesion confined to the epidermis. The etiology of this precancerous lesion includes sun and carcinogen (e.g., arsenic and occupational chemicals) exposure.[1-3] The intent of this case report is to describe clinical characteristics of BD, appropriate workup, treatment, management and differential diagnosis. This report is intended for optometry students, optometrists and eyecare professionals.

Case Description

Initial visit: comprehensive eye exam

A 76-year-old Caucasian male presented to the eye clinic with a chief complaint of a “bump” on his left lower eyelid that he first noticed approximately 2 years prior. He reported the lesion had not grown in size but was cosmetically bothersome. The patient denied any associated bleeding, ulceration, pain or pruritus. This was a first-time occurrence of such a lesion on his eyelid; however, he reported a history of basal cell carcinoma (BCC), squamous cell carcinoma (SCC), actinic keratosis (AK) and seborrheic keratosis (SK). The BCC lesions were removed via excision from his right preauricular area and his left upper thigh. The SCC lesions were removed via excision from his left forehead. He had numerous AK lesions present on his left temple, left ear, forearms and hands, which were monitored annually by dermatology for progression. The SK lesion was removed from his right mid-chest via liquid nitrogen for cosmetic reasons.

Figure 1. Left lower eyelid lesion. Note the scaly lesion at the infraorbital crease (arrow).
Click to enlarge

The patient's ocular and systemic history were significant for blepharitis, dry eye syndrome, a single episode of herpes zoster ophthalmicus of the left eye (which resolved in 2006), bilateral radial keratotomy (performed in 1989), bilateral age-related cataracts, prostate cancer (Gleason 6, diagnosed in 2010), and benign essential hypertension. His systemic medications included hydrochlorothiazide 25 mg tab and lisinopril 40 mg tab daily. The prostate cancer was being actively surveilled (most recent prostate specific antigen (PSA) level – 6.72 ng/ml; transrectal ultrasonography (TRUS) – 44.53 gm).

The presenting spectacle prescription was +1.50 +1.25 x025 in the right eye (OD) and +3.25 sphere in the left eye (OS). Best spectacle-corrected visual acuities were 20/25 OD and 20/25 OS. Manifest refraction revealed no changes to the presenting spectacle prescription. Pupils were equal, round and reactive to light with no afferent pupillary defect noted. Extraocular motility and confrontation visual fields were normal in both eyes (OU).

A slit lamp biomicroscopy assessment of the anterior segment OU revealed meibomian gland dysfunction and trace blepharitis of the upper and lower eyelids. The upper and lower eyelids had normal apposition to the globe. The left lower lid revealed a 1 mm x 1 mm scaly lesion at the infraorbital crease with no palpable lymph node suggestive of metastasis **(Figure 1)**. Neovascularization, feeder vessels, telangiectasia, bleeding, ulceration and crusting were absent. Intraocular pressures were 10 mmHg OD and 11 mmHg OS, measured by Goldmann applanation tonometry. All other anterior segment findings were non-contributory. Dilated fundus examination revealed unremarkable optic nerves, vasculature, macula and peripheral retina OU. Based on the exam findings, the patient was referred to the oculoplastic department for further evaluation.

Referral to oculoplastics department: problem-focused eye exam

The patient presented to the oculoplastics department for lesion evaluation and biopsy. Evaluation of the lesion in maximum room illumination revealed a flat, reddish lesion with no apparent risk factors for metastasis and no palpable preauricular node. Upon slit lamp biomicroscopy assessment, the findings were confirmed from the initial comprehensive eye exam. Because the lesion did not appear ulcerated, crusted, pearly, or tan in color, the suspicion for BCC, SCC and SK were low. BD, AK and psoriasis remained on the differentials to be ruled out. The patient was educated that the lesion could be monitored for change via photography, or a shave biopsy could be performed to give a definite diagnosis. The patient opted for biopsy of the lesion.

Risks, benefits and side effects were fully explained, and consent was obtained. The infraorbital crease was prepped with an alcohol swab and lidocaine. A blade was used to obtain a 0.6 cm x 0.3 cm skin shave excised to a depth of 0.1 cm and placed into a labeled container. Antibiotic ointment was placed on the surgical site, which was covered with gauze to allow for healing. The biopsy was sent to pathology for microscopic evaluation.

1 week post-biopsy: problem-focused eye exam

The shave biopsy of the lesion was positive for Bowen's disease (BD). The patient was educated on the condition and given the option of topical treatment of the lesion with imiquimod for 6 weeks followed by a 3-month follow-up. The patient declined imiquimod treatment and preferred to pursue lesion excision. Risks and benefits were explained, and a wide-local excision was performed. A 1.3 cm x 1.1 cm tan-brown skin shave, excised to a depth of 0.2 cm, was collected and sent to pathology for evaluation. Slit lamp biomicroscopy assessment revealed complete excision of the lesion with an intact incision, 2+ ecchymosis and satisfactory lower lid position. The patient was prescribed erythromycin ethylsuccinate ophthalmic ointment to be used twice daily on the surgical site to assist with healing.

2-day postoperative evaluation: brief eye exam

Figure 2. Photographs of patient's orbits 2 weeks post-excision of the lesion (arrow). Click to enlarge

The pathology microscopic examination was negative for malignancy of the surgical margins. A slit-lamp microscopic examination revealed satisfactory lower lid position with 2+ ecchymosis and 2+ edema. The lower lid incision was intact and healing well. The patient was instructed to continue erythromycin ointment twice daily for 1 week and to return for a 2-week post-op evaluation.

2-week postoperative evaluation: brief eye exam

At the follow-up visit, mild erythema was noted at the excision site, but it was healing well **(Figure 2)**. The patient was directed to discontinue erythromycin ointment. The patient returned to the general optometry clinic and was to be followed as needed in the oculoplastic department. It was recommended that the patient have an eye examination at least once a year to monitor for any suspicious skin lesions.

Educator's Guide

Key concepts

1. Characteristic traits of BD
2. Hallmark signs to differentiate malignant and benign skin lesions
3. Co-management and treatment – the optometric role in diagnosis of precancerous lesions
4. Prevention, care and patient education

Learning objectives

1. Identify ocular signs and symptoms of BD
2. Differentiate between BD and other precancerous and benign skin lesions
3. Describe various treatment approaches for precancerous skin lesions
4. Understand appropriate follow-up intervals and risk factors for precancerous lesion progression

Discussion points

1. Basic knowledge and concepts related to BD:

   a. Describe the classic presentation of a BD skin lesion
   b. Describe the etiology of BD and patient demographics
   c. Discuss risk factors involved in skin lesion progression

2. Differential diagnosis, prognosis, treatment and management:

   a. What options are available to diagnose skin lesions, and which is most precise?
   b. What is the prognosis of BD?
   c. What are the treatment options, and which ones are expedient?
   d. What is the recommended follow-up interval for patients who elect to monitor eyelid lesions?

3. Critical-thinking concepts:

   a. The importance of optometry in the identification and co-management of skin lesions
   b. Methods to help optometrists identify and properly describe eyelid lesions – terminology and high-risk characteristics to help with solidifying knowledge

Discussion

Teaching instructions and assessment methodology

This case report targets third- and fourth-year optometry students and optometry residents. Readers should study the entire background and case report and answer all discussion questions in the Education Guidelines. The images would be best highlighted in a PowerPoint presentation, as the presenter can ask students to describe the characteristics of the lesion. A verbal case discussion should also emphasize how malignant lesions can be very subtle in presentation, as with this patient.

The presenter should discuss the importance of:

1. obtaining thorough patient history (including questioning about known skin lesions or cancers)
2. evaluating eyelid architecture (both externally and with the slit lamp) to check for any lesions with asymmetry and irregular borders, changes in lid contour, redirection of eyelashes, madarosis or irregular skin texture
3. palpating and moving loose skin to reveal any abnormal characteristics such as elevation or firmness that can be hidden in the dermatochalasis of geriatric patients
4. photodocumenting and prompt referral for dermatological evaluation and biopsy

Pathophysiology

Figure 3. Illustration showing epidermal layers and their cellular structures, National Cancer Institute.[4]
Click to enlarge

BD is referred to as carcinoma in situ, or “cancer in its place” in Latin, because abnormal cell growth remains confined to the epidermis **(Figure 3)** and is therefore considered precancerous. The epidermis is composed of three cell types: melanocytes, keratinocytes and basal cells. BD is a premalignant variation of keratinocytes, which are also referred to as squamous cells. Keratinocytes form at the bottom of the epidermis and rise to the top to be replaced (Figure 3).[4] Progression of the lesion can lead to SCC, which occurs in 3-4% of cases.[2,5] Approximately 5-10% of skin cancers occur on the eyelid, with SCC being the second most common eyelid malignancy. It accounts for approximately 5-10% of all malignant eyelid tumors.[6]

Etiology, epidemiology and clinical presentation

The etiology of BD is multifactorial and it may arise spontaneously or from other precancerous lesions, such as AK. Chronic sun exposure, carcinogen (e.g., arsenic and occupational chemicals) exposure, human papillomavirus, previous injury to the skin, and immunosuppression have all been linked.[2,3] BD is more prevalent in women and primarily affects individuals of Caucasian and Asian descent between the sixth and ninth decade of life.[1,2] Early lesion formation is subtle and slow-growing, leading to a delay in diagnosis. Clinically, the lesions appear well-demarcated, dry and scaly as red patches or plaques.[7] About 66% of the time, BD will appear as a single lesion.[1] Lesions can vary in size and arise in areas with frequent sun exposure, such as the face, head and neck.[2]

Evaluation and further testing

A comprehensive workup is necessary to diagnose an individual with BD. The lesion is examined for its color, shape, size, border and elevation, and palpated to determine malignancy potential. Diagnosis is confirmed via biopsy or dermoscopy. A biopsy collects a tissue sample that is analyzed for the histological presence of a disease. BD biopsies are performed by shave, punch or excisional techniques.

Shave biopsy is the preferred method and used for raised lesions that do not extend into the dermis. This procedure is cost-effective and has good cosmetic outcomes but is prone to inadequate sampling. Punch biopsies allow for full-thickness samples that require deeper tissue for diagnosis. Samples are limited to small areas (1-4 mm) and therefore also provide good cosmetic outcomes. Excisional biopsy removes an entire lesion or area of abnormality. Sutures are used to close the incision, which may leave a visible scar over time. Dermoscopy, or skin surface microscopy, is a non-invasive method to evaluate the epidermis and detect diagnostic patterns that are suggestive of malignant or benign lesions. BD lesions are typically clustered together and have glomerular and dotted vessels when evaluated with dermoscopy.[1,8,9]

Differential diagnosis

Table 1. Click to enlarge

SK, AK, psoriasis, superficial BCC and cutaneous SCC must be ruled out in cases of suspected BD **(Table 1)**. SK lesions are a benign proliferation of the epithelium arising on the face of elderly individuals and are pigmented, raised lesions with fissures, giving them a ‘stuck-on’ appearance.[10] These lesions are easily removed and do not have malignant tendencies. AK is also a squamous cell carcinoma in situ but differs from BD in its appearance.[11] AK lesions are smaller pink, red or brown patches that cluster in areas of chronic ultraviolet (UV) exposure.[5,10,11] They are frequently treated with liquid nitrogen or topical antineoplastic agents. Psoriasis is an inflammatory reaction of the skin in which cells multiply quickly and build on themselves. Psoriasis is differentiated from BD by its thick, silvery scales that overlie a pink patch of skin covering areas of the scalp and joints. Psoriasis is incurable but can be controlled with retinoids, topical steroids or phototherapy. BCC appears as raised, pearly-white nodules with telangiectasia. BCC represents about 90% of eyelid malignancies and presents in middle-age, fair-skinned individuals.[3,5] BCC histologically differs from BD in that it arises from basal cell transformation within the epidermis.[10] Most BCC lesions are found on the neck and head, but approximately 20% are periocular, with the lower eyelid being the most frequent periocular location.[2,3,5,6] BCC is locally invasive, rarely metastasizes, and is removed via surgical intervention or topical antineoplastic agents. SCC is the second most common eyelid malignancy, and like BCC, is typically found on the lower eyelid.[3,8,12] SCC arises from small keratin patches that transform into an ulcerated lesion with irregular borders.[10,12] These lesions are invasive and metastasize through the lymphatic system, surrounding tissue and organs.[3] SCC is commonly treated via surgical excision or radiation therapy.

BD treatment and management

Several treatment options for BD are available and categorized into surgical and topical interventions. Surgical interventions include excision, Mohs micrographic surgery, cryotherapy and curettage and desiccation (C&D). Frozen section-guided wide-local excision is the simplest and most utilized surgical intervention; it involves removing the lesion along with a quarter inch of the surrounding tissue.[13] The mass is subsequently sent to pathology for frozen section examination to ensure that all margins are cancer-free. Mohs micrographic surgery provides a high cure rate and is used when tissue sparing is vital as is the case for larger lesions with irregular borders; however, it is more expensive than traditional excision.[7,13] C&D is one of the most cost-effective treatment options and is performed under local anesthesia; the skin lesion is scraped away and cautery is used to prevent hemorrhaging.[13] Cryotherapy involves the use of liquid nitrogen to destroy skin cells.[13] Liquid nitrogen freezes a lesion causing it to scab and fall off. Of all the surgical techniques, wide-local excision is the treatment of choice for BD.[13]

Topical interventions include photodynamic therapy (PDT) and antineoplastic agents. With PDT, a cream specific to cancer cells is applied to a lesion and exposed to laser, releasing toxic material thereby

destroying abnormal cells.[13] Antineoplastic agents are medications used to treat cancer by inhibiting cell division. Two specific antineoplastic medications used in BD are imiquimod and 5-fluorouracil. Imiquimod stimulates the immune system and is thought to increase the presence of lymphocytes, macrophages and dendritic cells within a BD lesion.[3,13,14] 5-fluorouracil interferes with DNA synthesis to reduce cell proliferation and has a cure rate of about 80%. [13]

Prognosis and patient counseling/prevention

Overall, BD has a favorable prognosis with a risk of conversion to SCC of 3-4%.[2,5] After treatment, there is a 10% chance of BD reocurrence.[13] Optometrists should counsel their patients on preventative measures including the use of broad-spectrum sunscreen, wide-brimmed hats, UV400 sunglasses, avoiding chronic sun exposure, refraining from tanning bed use, and actively self-examining their skin for new or developing lesions. Patients should be educated on abnormal characteristics of a lesion such as sclerosis, hemorrhaging, allodynia, growth and/or change in pigmentation. Patients with a history of skin cancer should also have a screening with their primary care physician or dermatologist every 6-12 months.

Critical-thinking concepts

Eyecare providers can actively assess for sun damage on a patient's face and detect associated lesions that are at risk for progression. Malignant lesions tend to change over time, whereas benign lesions appear stable at follow-up exams. Some key features to keep in mind for malignant lesions are they tend to be firm to the touch, have irregular borders, are asymmetric in appearance, and may distort eyelid margins. When assessing and documenting a lesion's appearance, the clinician should start with maximum room illumination and observe the lesion at arm's length. Note should be made of color, orientation, approximate size and any distortion to the eye anatomy caused by the lesion. Slit-lamp magnification should be used to observe any vessel growth, ulceration, hemorrhaging or discharge. Photography of a lesion is recommended to monitor for any changes at subsequent exams.

Conclusion

BD is a precancerous lesion that may have delayed diagnosis due to its slow-growing nature. Lesions frequently arise between the sixth and ninth decade of life on areas of sun-exposed skin. Co-management between eyecare professionals and dermatologists is imperative to successfully diagnose and treat BD as well as monitor patients for recurrence. BD appears similar to other skin lesions and thus requires biopsy for a definitive diagnosis. Lesions are typically treated surgically with excision but can also be managed topically with antineoplastic agents. BD has a favorable prognosis with a low risk of progression to SCC.

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Dr. Muhanna [zainab_muhanna@yahoo.com] is a primary care and ocular disease resident at the Michael E. DeBakey VA Medical Center in Houston, TX. She graduated from the University of Houston College of Optometry in 2019 and currently provides primary eye care at a private practice.

Dr. Tran, a 2014 graduate of University of the Incarnate Word Rosenberg School of Optometry, completed a primary care optometry residency at the Michael E. DeBakey VA Medical Center in Houston, TX, where she now works as an Attending Optometrist.

Dr. Segu received her master's in public health from the University of Texas School of Public Health and her doctorate from the University of Houston College of Optometry in 2004. She completed her residency in hospital-based optometry at the Hudson Valley Veterans Administration Health Care System in New York. Dr. Segu is currently Staff Optometrist and Residency Director at the Michael E. DeBakey VA Medical Center in Houston, TX, and Chair of the Texas Public Health Association Vision Care Section.