Bilateral Corneal Erosion Due To Retail Purchase of Unfitted Prescription Contact Lenses: A Case Report

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Purpose: We report a case demonstrating the importance of trial fitting before the dispensing of prescription contact lenses.

Methods: The patient was an 18-year-old computer-using experienced hydrogel lens wearer who ran out of contact lens supply. The patient purchased a brand new box of daily disposable lenses from a retail store having known his back vertex power. No trial fitting of the lenses was performed at the point of sale.

Results: After a day of wear of the lenses with significant computer use, the patient removed them and went to bed, but the next morning, presented on an emergency basis with severe pain and blurry vision in both eyes. Slit lamp examination showed significant bilateral corneal erosions that were treated with prophylactic antibiotics, steroids, and lubricants. A bandage contact lens was further given to his right eye. The characteristics of the daily disposable lenses and his computer overuse were viewed as contributing factors to the complication.

Conclusions: The dispensing and wear of prescription contact lenses without a proper selection and fit led to bilateral corneal erosions in this patient. Though our case occurred in Taiwan, a jurisdiction where prescription contact lens sale is not regulated, the authors note that such a scenario could occur in jurisdictions where contact lens sale is regulated if, after confirmation of back vertex power, no effort is made to ensure that a purchased lens is safe or appropriate for a patient, such as when lenses are purchased through internet suppliers or in certain commercial retail settings.

Key Words: contact lens complication, contact lens dehydration, corneal diseases, corneal erosion, over the counter, video display terminal

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The risks associated with the unregulated sale and wear of over-the-counter colored contact lenses have been documented in the literature.[1–10] They typically occur due to issues relating to lack of patient education regarding contact lens safety and include failure of the patient to implement proper infection control measures, failure to perform proper lens insertion and removal, and failure to remove the lenses before sleeping.

We report a case demonstrating a complication arising from an over-the-counter purchase and wear of a prescription contact lens that was not fitted on an eye by a professional.

CASE REPORT

The patient was an 18-year-old male hydrogel lens wearer of 6 months with reported dryness associated with contact lens overwear and computer overuse, who ran out of lens supply. Previously fit with 2-week replacement disposable lenses (hilafilcon B, Soflens Comfort; Bausch & Lomb, −6.00/8.60/14.20, center thickness: 0.14 mm), which he routinely overwore as monthly disposable lenses, the patient was interested in trying daily disposable lenses and purchased a box of lenses (etafilcon A, 1-Day Acuvue, −6.00/8.50/14.20, Center Thickness: 0.084 mm) that matched his back vertex power from a retail store. No trial fitting of the lenses was performed by the dispensing clerks.

The patient wore the new lenses for 14 hours while using a computer for 8 hours and then removed them before sleeping. He reported feeling no unusual pain but did report some discomfort due to dryness and increased difficulty in lens removal. The next morning, the patient awoke with severe pain, photophobia, and blurry vision bilaterally. He presented to a university-based eye clinic that morning unable to keep his eyes open. After applying topical anesthetic to both eyes, slit lamp examination showed a central 4 × 8-mm superficial epithelial erosion in the right eye (Fig. 1) and a smaller 0.5 × 2-mm erosion in the left eye (Fig. 2), plus many smaller epithelial erosions bilaterally.

Treatment of both eyes involved prophylactic codemycin ointment (neomycin and hydrocortisone) twice daily and 0.02% fluorometholone to be used 4 times a day. The right eye was additionally given a bandage contact lens to be worn overnight, along with ocular lubricants. The patient was asked to return the next day.

The next morning, slit lamp examination revealed a nearly intact epithelium on both eyes and pain significantly reduced. The patient was given the same antibiotic, steroid, lubricant, and bandage lens treatment combination for another 3 days.

At the 3-day follow-up, the epithelium was fully intact. The patient was continued on the antibiotic, steroid, and lubricant for another 7 days.

Six weeks after the initial visit, the patient returned again. He was interested in resuming contact lens wear and asked if it was safe for him to wear the daily disposable lenses that he had purchased.

The patient's keratometric readings were 41.00@175/41.50 @085 in the right eye and 41.25@180/41.37@090 in the left eye. The daily disposable lenses were placed on eye and assessed after 10 minutes. Movement was minimal on both the static fit (approximately 0.3 mm) and the push-up test. The lenses were deemed

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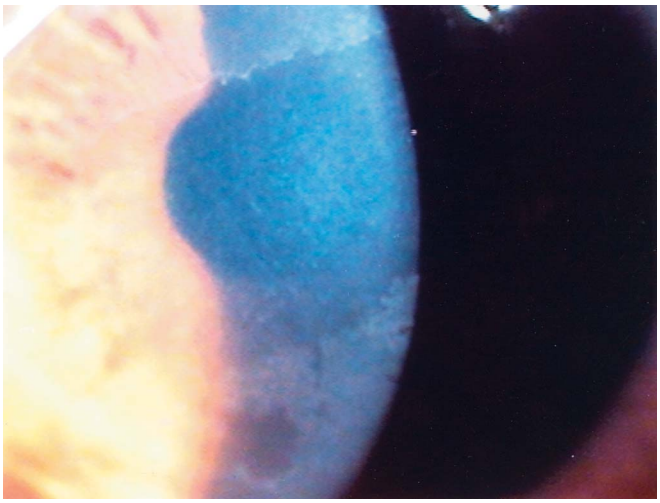

FIGURE 1. The patient's right eye showing a central 4 × 8-mm corneal erosion and a smaller inferior erosion the morning after a day of wear of a daily disposable contact lens purchased without a trial fitting.

too tight. On lens removal, mild diffuse corneal superficial punctate keratitis was observed bilaterally, particularly in the corneal periphery. Fluorescein tear breakup time was measured at ~4 seconds in each eye and phenol red thread was measured at 7 and 8 mm for his right and left eyes, respectively.

Given the dryness signs and his epithelial complication, the patient was advised to discontinue wear of the daily disposables and to seek an appropriate lens fitting.

DISCUSSION

Our case demonstrates a hazard associated with the dispensing of prescription contact lenses without a proper fitting. We believe it to be the first in the literature that reports corneal erosions arising from unfitted prescription contact lenses.

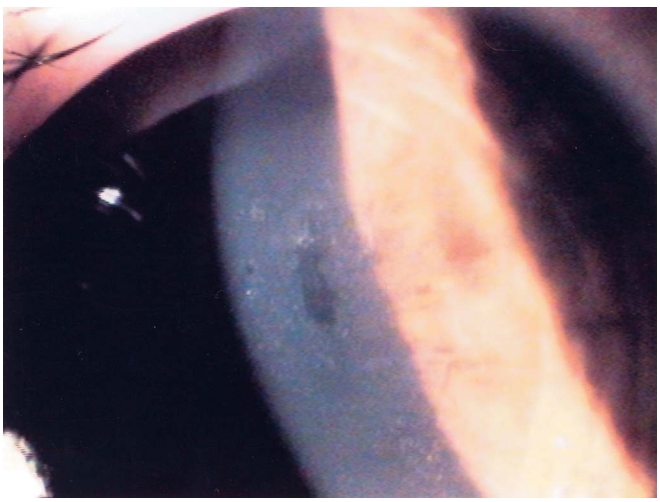

FIGURE 2. The patient's left eye showing a smaller corneal erosion with the same contact lens wearing history as the right eye.

The erosions, which happened in a manner similar to which recurrent corneal erosion is thought to occur upon awaking,[11] appear to have been induced by the previous day of wear of the unfitted daily disposable lenses and exacerbated by the patient's computer overuse. His original lens, the Bausch & Lomb Soflens Comfort, is marketed in Taiwan as a 2-week replacement lens that exists in a one-size-fits-all format with a base curve of 8.6 mm. The 1-Day Acuvue lens that he purchased exists in 2 base curves; 8.5 mm for steeper corneas and 9.0 mm for flatter corneas. From a fitting standpoint, the patient switched from a lens designed to fit the average cornea to a lens designed to fit the steeper cornea. On eye, the 1-Day Acuvue fit tight.

Tight fitting lenses have been associated with increased levels of epithelial disruption and staining due to frictional forces of the lens on the eye and the thinned postlens tear film in the areas of greatest squeeze pressure. Young and Coleman[12] suggest the effect might be particularly pronounced in those with poor tear quality or prelens tear instability. In our case, the patient's computer usage would have led to an increased susceptibility to epithelial disruption as prolonged use of visual display terminals has been associated with decreased blink rates, reduced lacrimation, increased tear evaporation, and instability of the precorneal tear film.[13–15]

In addition to the above, the characteristics of the daily disposable lenses themselves were also likely contributing factors to the epithelial complication. Hydrogels dehydrate during wear,[16–18] which can cause dryness to the corneal and epithelial surface as fluid is wicked from the tear film through the lens by pervaporative osmotic force.[19] This outcome is particularly pronounced in mid–water content to high–water content thin lenses; two attributes characteristic of daily disposable lenses, such as the 1-Day Acuvue (58% water content and 0.084 mm center thickness) that the patient wore, that are intended to increase their oxygen permeability.[20] In several studies,[17,18,21,22] the Acuvue lens was specifically noted to show significant dehydration compared with other lenses of similar water content, particularly after 7 hours of uninterrupted wear. The patient's original lens, the Bausch & Lomb Soflens Comfort, had a similar water content (59%) as the 1-Day Acuvue, but a center thickness of 0.14 mm. Lenses that undergo dehydration have been associated with dimensional changes, although the effect on comfort, fit, and movement remains uncertain, with some studies suggesting a change in clinical performance[21–23] and others suggesting no significant change at all.[17,18,24]

Our case highlights the importance of ensuring a proper selection and fit of a lens before its dispensing. The experienced contact lens fitter would typically avoid fitting mid–water content to high–water content lenses with thin center thicknesses to patients who work in dry environments or spend significant amounts of time using video display terminals. Though our patient purchased his lenses in Taiwan, a jurisdiction where prescription contact lens sales are unregulated, the complication he faced could conceivably occur in a jurisdiction where the sale of prescription lenses are regulated by licensed professionals if, after confirmation that

the outgoing lens back vertex power is correct, no effort is made to confirm that the purchased lens is appropriate or safe for the patient. The authors note that fitting safeguards are not implemented in many commercial retail settings and do not exist at all when contact lenses are purchased online or through mail-order outlets.

It is not sufficient that contact lenses, whether they are prescription lenses or nonprescription cosmetic lenses, be dispensed by trained professionals; they must further be shown to be appropriate for patients through a proper trial fitting and case history assessment when a new lens brand and specification is being purchased. Though the epithelial erosions witnessed in our case do not present the same morbidity as an infectious ulcer associated with the sale of over-the-counter colored contact lenses, our case highlights the potential risks involved.

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