Treating Recurrent Erosion Syndrome

The medical and surgical options.

BY NEIL J. FRIEDMAN, MD

Recurrent erosion syndrome is commonly encountered in comprehensive ophthalmic and cornea practices. Patients suffering from this chronic condition experience episodic attacks of varying frequency and severity. Mild forms of the disorder often respond to conservative therapy, but the more severe cases usually require some type of surgical intervention. This article reviews recurrent erosion syndrome with a particular focus on the management of this potentially disabling syndrome.

BACKGROUND

The corneal epithelium is bound to the stroma by special basement membrane adhesion complexes. Any traumatic, dystrophic, or degenerative disturbance to these adhesion complexes can result in the faulty attachment of the epithelial cells and subsequent recurrent erosions.1 This problem most commonly occurs after a corneal abrasion, usually a superficial shearing injury (eg, fingernail, tree/plant branch, hairbrush, etc.) or as a result of anterior basement membrane dystrophy (ABMD).2,3 In general, approximately 50% of patients with recurrent erosion syndrome have ABMD, whereas only 10% of patients with ABMD develop recurrent erosion syndrome. Recurrent erosions can also be associated with less common corneal dystrophies such as granular, lattice, Reis-Buckler’s, and Fuchs’, and they may rarely develop after ocular surgery (ie, cataract or corneal refractive).

The exact mechanism for the abnormal epithelial adhesion is not known, but a weak area of corneal epithelium may loosen or slough at any time. In traumatic cases, the first erosion may develop weeks, months, or even years after the initial injury. Erosions usually occur in the inferior third of the cornea upon waking when the eyelids open. This is presumably due to mechanical rubbing of the lids over the cornea. During sleep, the lids may adhere to dry epithelium. Also, the corneal epithelium swells slightly overnight when the lids are closed, which may further weaken the already loose attachments.4 Patients sometimes state that their lid feels stuck to the eye or the eye feels dry, and they may rub the eye when they awake. The friction of the lid’s sliding over the abnormal area of epithelium dislodges it. This problem can also occur with rapid eye movements during sleep.

Depending on their size and location, erosions cause varying degrees of pain, redness, blurred vision, tearing, and photophobia. Sometimes, the symptoms are mild and transient, consisting only of a faint foreign body sensation that resolves within an hour. Other episodes produce intense pain and reduced vision that can persist for days. Some patients experience an erosion just once during their lives, whereas others can have them on a daily basis. For those with frequent, severe episodes, recurrent erosion syndrome can be debilitating.

Patients suffering from recurrent erosion syndrome should be specifically questioned about previous corneal injuries and eye surgery. During the slit-lamp examination, an active erosion is evident as an area of punctate keratitis, ragged epithelium, or a frank epithelial defect (Figure 1), but the physician must also inspect the corneas for signs of a corneal dystrophy. ABMD can be mild and asymmetric with only a few visible dots, rather than the classic appearance of many discrete map lines, dots, and fingerprints (Figure 2). If findings of ABMD are not evident on careful direct and retro-illumination, then subtle changes may be apparent as areas of negative staining with fluorescein (epithelial irregularities where the fluorescein breaks up quickly).
MANAGEMENT

There are various treatment strategies for recurrent erosion syndrome. Generally, conservative therapy precedes surgical intervention, but the type and order of treatment should be tailored to the individual according to the characteristics of the erosions (etiopathology, frequency, and location with respect to the visual axis), the patient's compliance with the prescribed treatment regimen, probability for success, availability of equipment, etc. For infrequent and traumatic erosions, a medical treatment is usually administered first. For frequent dystrophic erosions, a surgical option is typically required and may be considered initially.

The acute treatment of an erosion is similar to that for a corneal abrasion: topical antibiotic, cycloplegia, analgesia (topical nonsteroidal anti-inflammatory drug or stronger oral medication as needed), and pressure patching or a bandage contact lens. The bandage contact lens may be left in place for several weeks to protect the corneal surface and allow the epithelium to heal better. Medical prophylaxis consists of lubricating eye drops and 5% sodium chloride ointment at bedtime for up to 1 year. This therapy reduces physiologic nocturnal epithelial edema and the friction between the eyelid and cornea. Autologous serum drops have proven beneficial but are infrequently prescribed because of the inconvenience of obtaining them. Another reported topical treatment is P-derived peptide and insulin-like growth factor I drops. A course of topical steroids (t.i.d. for 2-3 weeks) and oral doxycycline (50 mg p.o. for 2 months) may also be effective, and this therapy should be considered prior to the more invasive options. These matrix metalloproteinase-9 inhibitors appear to work best for traumatic erosions.

Surgical procedures include superficial keratectomy (epithelial debridement), superficial keratectomy with diamond burr polishing of the underlying corneal surface, anterior stromal puncture (epithelial reinforcement) with a needle or Nd:YAG laser, and phototherapeutic keratectomy (PTK). Various methods of epithelial debridement have been reported, including mechanical (Weck-Cel sponge [Medtronic ENT, Jacksonville, FL], disposable blade, blunt spatula, Amoils brush) and alcohol-assisted. During manual debridement, the weakly adherent epithelium may be readily apparent as a loose, freely mobile sheet of tissue that can be easily wiped away in one large piece. The epithelium may also be multilaminar and fragment irregularly in different areas. Regardless, it is important to remove all of the abnormal epithelium. Simple debridement and a bandage contact lens may be successful for traumatic erosions but are rarely effective for dystrophic ones.

PROGNOSIS

Recurrent erosion syndrome can be frustrating for both the patient and the ophthalmologist. Even after intervention, recurrences are common—hence the name of the condition. The reported rates of recurrence after treatment vary widely, mainly because most have been determined from small series of patients and the underlying etiology affects the success of treatment. In general, one-third of patients experience a recurrence after medical therapy, and one-quarter have a recurrence after surgical treatment (12%-18% for superficial keratectomy, 6%-25% for diamond burr polishing, up to 40% for stromal puncture, and 24%-27% for PTK).

In my experience, PTK is the most successful option, and I will usually proceed directly to this treatment in...
severe cases. I have not seen a recurrence after PTK with follow-up as long as 10 years. Initially, however, some of these patients require a small touchup procedure with the laser and thereafter are symptom free. When performing stromal puncture, the treatment area must extend 1 to 2 mm beyond the edge of the abnormal epithelium to reduce the risk of recurrence. Treatment within the visual axis is usually well tolerated by the patient but often avoided by the physician because of a concern about visually significant scarring. The Nd:YAG technique results in more reproducible, shallow, and translucent punctures, which could be an advantage when treating the central cornea. Similarly, PTK can cause scarring (haze) as well as a hyperopic shift. With the low number of pulses applied to treat recurrent erosion syndrome, however, these are very rare complications, which I have not encountered. Diamond burr polishing may be as effective as PTK and is a much less costly procedure that can be performed at the slit lamp.

When managing recurrent erosion syndrome, often more than one treatment is necessary, particularly for severe cases. It is therefore important to be familiar with the various modalities, to discuss the treatment plan with the patient, and to set appropriate expectations. By doing so, ophthalmologists can make the experience easier and more tolerable for their patients and themselves.

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