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# In Brief

## Corneal Abrasions

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Corneal abrasions can present with a variety of symptoms, including eye tearing, the sensation of a foreign body in the eye, discomfort with blinking, sharp pain, and photophobia. In infants, corneal abrasions have presented as initially unexplained, inconsolable crying. Obviously, caution must be taken not to overlook a potentially more serious cause of the infant's discomfort when attributing inconsolable crying to a small corneal abrasion. A child may be continually

rubbing an eye which is watery and red. The injury that causes the corneal abrasion may be mild and usually occurs accidentally; often there is a history of the eye being scratched or hit by an object. Corneal abrasions are caused also by prolonged or inappropriate use of contact lenses.

The cornea is highly innervated, and even a small abrasion can cause pain that ranges from mild to severe, often making the child reluctant to open the injured eye because of the discomfort. Patients may have episodes of intermittent sharp pain from spasms of the ciliary body in response to the injury.

In the case of the patient who wears contact lenses, the lenses should be removed before examination of the eyes. Instillation of a topical anesthetic, such as proparacaine 0.5% or tetracaine 0.5%, will relieve the patient's discomfort as well as facilitate the examination. The drops take action in ~20 seconds and can give symptomatic relief for up to 20 minutes. If the patient has relief of symptoms after the drops are applied, the problem can be localized to the conjunctiva or cornea.

Examination of the eye for an abrasion is facilitated by the use of topical fluorescein, which is available in paper strips or in combination with a topical anesthetic in solution. When the more readily available paper strip is used, it should be moistened with saline or with topical anesthetic drops before it is applied to the surface of the eye to prevent it from abrading the cornea. The lower eyelid is pulled down to expose the pink palpebral conjunctiva, to which the test strip is touched. The fluorescein will diffuse along the eyelid and eyeball, fully distributing over the entire surface of the eye when the patient blinks. Care

should be taken to avoid oversaturating with fluorescein because this excess can obscure small abrasions.

After the fluorescein is instilled into the eye, the examiner should inspect the eye by using a blue or ultraviolet light, a feature of most current ophthalmoscopes, or with a Wood or Burton lamp. The fluorescein, which washes off intact corneal epithelium but stains the underlying stroma exposed by an abrasion, will fluoresce under blue light as yellow-green in the area of injury.

In the presence of multiple vertical linear abrasions, the examiner should be suspicious of a retained foreign body under the upper eyelid. In this situation, the eyelid should be everted by placing a cotton swab along the middle of the upper eyelid while the patient is instructed to gaze downward; the cotton swab is then gently rolled toward the eyelashes, rolling the skin with the swab and causing the eyelashes to turn toward the examiner, thus allowing gentle vertical traction on the eyelashes with downpressure on the swab, which will evert the lid. A moistened cotton swab or forceps can be used to remove any retained foreign body. Once examination of the everted lid is completed, the patient can be instructed to gaze upward to revert the eyelid, or the examiner can gently massage the lid downwards. If there is concern that the superficial abrasion is associated with a deeper injury, such as in the presence of a teardrop or irregularly shaped pupil, or if the foreign body is embedded, urgent consultation with an ophthalmologist should be pursued.

The treatment of a corneal abrasion depends on the likely source of the injury. In patients who do not wear contact lenses, an antibiotic ointment such

as erythromycin, bacitracin, or polymyxin B/bacitracin should be applied every 2 to 4 hours, or antibiotic drops such as polymyxin B/trimethoprim should be used. For an injury caused by a fingernail or vegetable matter, fluoroquinolone drops four times daily or ciprofloxacin ointment every 2 to 4 hours provide more appropriate coverage. In the case of an abrasion from a contact lens, antipseudomonal coverage is indicated. Appropriate treatment is with either tobramycin or ciprofloxacin ointment every 2 to 4 hours, or with tobramycin, ciprofloxacin, gatifloxacin, or moxifloxacin drops four times daily. The choice between an ointment and drops depends upon the needs of the patient. Ointments provide better lubrication and a barrier between the area of abrasion and the eyelid, but they tend to blur the patient's vision. Corticosteroids should be avoided because they may retard the healing of the epithelium and increase the risk of infection.

Topical nonsteroidal agents may be used for pain control in patients who

do not have other diseases of the ocular surface. Ketorolac used four times a day for 3 days can be prescribed, but its effectiveness and safety have been studied in adults only. Oral acetaminophen also can be effective in pain relief, and oral narcotics may be used in cases of severe pain. The use of patching is rarely necessary but may be used for comfort. Patching should never be used in the cases of injuries from false fingernails, vegetable matter, or contact lenses, because covering the eye can lead to an environment more favorable to bacterial ulceration of the cornea.

Corneal abrasions heal rapidly, often within 24 hours for smaller injuries. Patients who wear contact lenses or have a history of ocular herpes should be referred urgently to an ophthalmologist for consultation. Patients who wear contact lenses should not resume their use until the cornea is evaluated and documented to be healed by an ophthalmologist; the usual recommendation is to avoid contact lenses until the injured eye has felt normal for at least 1 week.

Patients with large or central abrasions should be referred to an ophthalmologist. Any patient who has been treated with an eye patch should return for re-evaluation in 24 hours, or sooner if symptoms worsen; if the patient is symptom free at 48 hours, usually no follow-up is required. Any patient who continues to experience pain or the sensation of a foreign body for more than 2 to 3 days or has an increase in pain or worsening redness of the eye should be referred to an ophthalmologist.

**Comments:** Evidence trumps orthodoxy. Not so many years ago it was our well-accepted practice to patch every eye with a corneal abrasion, just as we immobilized every clavicular fracture in a figure-of-eight wrap. Of more serious consequence, with great conviction, we also urged parents to sleep their infants on their bellies. Live and (hopefully) learn.

*Henry M. Adam, MD*  
Editor, In Brief

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