Vision Health: Conditions, Disorders & Treatments – CORNEAL DISEASES

There are a number of diseases that affect the cornea, the clear front window of the eye that covers the iris (the colored part of the eye) and the round pupil.

**Corneal Abrasion**

The cornea is the clear front window of the eye. It covers the iris (the colored portion of the eye) and the round pupil. The cornea is composed of five layers. The outermost layer is called the epithelium.

Injuries to the epithelium, such as scratches, cuts, or scrapes, are known as corneal abrasions.

Usually, these injuries are caused by fingernail scratches, makeup brushes, paper cuts, or rubbing of the eyes. Sometimes conditions like dry eye can cause abrasions.

Symptoms associated with corneal abrasions include tearing, redness, pain, soreness, and blurred vision.

Treatment options for corneal abrasions include patching the injured eye, dilating pupils to relieve pain, wearing special contact lenses that promote healing, taking antibiotics to prevent infection, and using lubricating eyedrops.

Minor abrasions usually heal within a day or two, while larger abrasions take about a week.

**Corneal Erosion**

Corneal erosion is caused by a loose attachment of the epithelium to the underlying tissue.

This often happens at the site of an earlier abrasion. Some patients have an underlying condition called "map-dot-fingerprint dystrophy" that predisposes them to having recurrent corneal erosions.

Symptoms of corneal erosion are similar to those of abrasions: pain, soreness, redness, and blurred vision.

Treatment is the same as for corneal abrasion and may also include saline solution eyedrops or ointments. However, if the erosion keeps occurring, further treatment may be necessary.
These treatments may include procedures to remove the damaged epithelium, removal of corneal cells using a laser, or performing an anterior stromal puncture, which involves making tiny holes on the surface of the cornea to promote stronger attachments between the top layer of corneal cells and the layer of the cornea underneath.

**Herpes Keratitis**

Herpes keratitis is a viral infection of the eye caused by the herpes simplex virus, best known for causing cold sores.

Herpes keratitis usually affects only one eye and most often occurs on the cornea—the normally clear dome that covers the front part of the eye.

The symptoms of herpes keratitis may include:
- pain;
- redness;
- blurred vision;
- tearing;
- discharge; and
- sensitivity to light.

If the infection is superficial, with ulcers involving only the cornea's top layer, called the epithelium, it will usually heal without scarring.

However, if it involves the deeper layers of the cornea, it may lead to scarring of the cornea, loss of vision, and sometimes even blindness. Left untreated, herpes keratitis can severely damage your eye.

Herpes keratitis is usually treated with antiviral medications, either in eyedrop or pill form.

Depending on the progression of the infection, your ophthalmologist (Eye M.D.) may treat your condition with steroid eyedrops to reduce inflammation.

Rarely, when the cornea is severely damaged, a corneal transplant may be necessary to improve vision.

**Keratoconus**

Keratoconus is an uncommon condition in which the dome-shaped cornea (the clear front window of the eye) becomes thin and develops a cone-like bulge.

As the condition progresses, the shape of the cornea is altered, distorting your vision. Usually, keratoconus affects both eyes, although symptoms and progression in each eye may differ.

Early symptoms include mild blurring of vision, increased sensitivity to light and glare, and mild eye irritation. The rate of progression varies.
Keratoconus usually begins in the teenage years. It may progress slowly for 10 to 20 years and then suddenly stop.

As it progresses, the most common symptoms are increased blurring, increased nearsightedness or astigmatism, inability to wear contact lenses, and frequent eyeglass prescription changes.

The causes of keratoconus are not known. Since an estimated 10% of people with keratoconus have a family member with the condition, some researchers believe genetics may play a role.

Keratoconus is usually corrected with eyeglasses. However, as the condition progresses, rigid contact lenses may be needed so that vision is improved.

If vision is greatly affected, a corneal transplant may be recommended. While this procedure will relieve the symptoms of keratoconus, it will not cure it completely.

Nonetheless, in advanced keratoconus corneal transplants offer the best prognosis for clear vision.

A new treatment called collagen cross-linking recently has been evaluated in the treatment of progressive keratoconus and has been shown to be effective in some patients.

**Lid Margin Disease**

Lid margin disease is a common and frequently chronic inflammation of the eyelids. Symptoms include irritation, itching, and, occasionally, a red eye.

This condition frequently occurs in people who tend to have oily skin, dandruff, or dry eyes.

Bacteria normally reside on the skin, but in some people, they thrive in the skin at the base of the eyelashes. Nearby oil glands may be overactive, causing dandruff-like scales and particles to form along the lashes and eyelid margins, which can cause redness, stinging, or burning.

Lid margin disease cannot be cured, but it can be controlled with a few simple, daily hygienic measures, such as the following:

- At least twice a day, place a warm, wet washcloth over your closed eyelids for a minute. Re-wet it as it cools, two or three times. This will soften and loosen scales and debris. More importantly, it helps liquefy the oily secretions from the eyelids' oil glands, which helps prevent the development of a chalazion, an inflamed lump in an eyelid oil gland.

- With your finger covered with a thin, wet washcloth, cotton swab, or commercial lint-free pad, gently scrub the base of the lashes for about 15 seconds per lid.

When medications are necessary, they may include:

- artificial tears (over-the-counter eyedrops) to relieve symptoms of dry eye;
- topical antibiotics to decrease bacteria on the eyelids;
- steroids (short-term), to decrease inflammation; and
- oral medication like tetracycline to thin oily secretions and prevent gland blockage.
Medications alone are not sufficient to control lid margin disease; the application of warmth and
detailed cleansing of the lashes daily are both essential.

**Pterygium**

A pterygium is a mass of fleshy tissue that grows over the cornea (the clear front window of the eye). It may remain small or may grow large enough to interfere with vision.

A pterygium most commonly occurs on the inner corner of the eye, but it can appear on the outer corner as well.

The exact cause of pterygia is not well understood. They occur more often in people who spend a lot of time outdoors, especially in sunny climates. Long-term exposure to sunlight – especially to ultraviolet (UV) rays and chronic eye irritation from dry, dusty conditions – seem to play an important role. Dry eye also may contribute to pterygium.

When a pterygium becomes red and irritated, eyedrops or ointments can be used to help reduce the inflammation.

If the pterygium grows rapidly or is large enough to threaten sight, it can be removed surgically.

Despite proper surgical removal, a pterygium may return, particularly in young people.

Protecting the eyes from excessive ultraviolet light with proper sunglasses, avoiding dry, dusty conditions, and using artificial tears can also help to reduce symptoms and slow progression.

**Pingueculum**

A pinguecula is a yellowish patch or bump on the white of the eye, most often on the side closest to the nose. It is not a tumor but is an alteration of normal tissue resulting in a deposit of protein and fat.

Unlike a pterygium, a pinguecula does not actually grow onto the cornea. A pinguecula can also be a response to chronic eye irritation or sunlight.

No treatment is necessary unless the pinguecula becomes inflamed. A pinguecula does not grow onto the cornea or threaten sight.

On rare occasions, a pinguecula can be surgically removed if it is particularly annoying.

**Recurrent Corneal Erosion**

The cornea is the clear front window of the eye covering the iris (the colored portion of the eye) and the round pupil. The cornea is composed of five layers and the outermost layer is the epithelium.
When the epithelium does not adhere correctly to the corneal tissue below, this can cause a condition called recurrent corneal erosion.

There are many possible causes of recurrent corneal erosion, including a history of corneal injury, such as corneal abrasion, and corneal disease.

Symptoms include:
- severe pain (often upon waking);
- light sensitivity;
- blurred vision;
- red eye;
- dryness; and
- tearing.

Often symptoms are first noticed upon waking in the morning. This is because when you open your eyes, your eyelids pull away the cells that have been loosened overnight.

Without treatment, your eye may continue to experience this erosion.

To detect and evaluate corneal erosion, eyedrops with green dye are placed in your eye. Your ophthalmologist may prescribe saline solution drops to help your epithelium adhere to the underlying tissue, and he or she also may ask you to use artificial tears to keep your eyes moist.

For patients with corneal erosion caused by corneal disease, an additional procedure may be necessary to remove the epithelium or adhere it to the underlying tissue in order to encourage a better bond.

Should you continue to experience recurrent corneal erosion despite conservative treatments, your ophthalmologist might suggest an additional procedure called a phototherapeutic keratectomy to remove a layer of corneal tissue with a laser.

This technique is used to promote healing and good adherence of the epithelium.

Fuchs Endothelial Dystrophy

Fuchs dystrophy is a progressive disease that affects the cornea, the clear dome that covers the iris (the colored part of the eye) and helps focus light as it enters the eye.

With this disease, cells in the cornea's inner layer, called the endothelium, are reduced in number.

This causes the remaining cells to swell or thicken. The loss of endothelial cells can also allow abnormal dewdrop-shaped growths called guttata to form. These cell changes may cause the cornea to become cloudy and swollen.

Because Fuchs dystrophy is a progressive disease, the changes to the cornea can interfere with vision over time.
Fuchs' dystrophy usually occurs in people after age 40. Studies show that it is an inherited condition.

Symptoms of Fuchs dystrophy include hazy or cloudy vision that develops in stages. In the first stage, as the cornea swells, vision in the morning may be hazy, but it clears up during the day.

Once the disease has progressed to a more advanced stage, vision no longer clears, and instead, you may experience pain and sensitivity to light.

It can take 20 years or longer for Fuchs dystrophy to progress from its earliest stage to a stage that is visually or physically significant.

To diagnose and monitor this condition, an ophthalmologist checks for adequate endothelial cell number and function, obtains an endothelial cell count, and may measure the thickness of the cornea.

Cataract surgery can sometimes cause the symptoms of Fuchs dystrophy to progress more quickly.

In its early stage, Fuchs dystrophy is treated with saline eyedrops to pull excess fluid from the cornea or by using a hairdryer to help dry the surface of the cornea.

As Fuchs dystrophy advances, you may be given a therapeutic bandage contact lens to lessen your discomfort.

If vision loss begins to interfere with your life in the latter stages of the disease, a corneal transplant technique known as penetrating keratoplasty or a variant where only the endothelium is replaced may be performed. This procedure has an excellent success rate.

**Dry Eyes**

Your eyes constantly produce tears at a slow and steady rate so that they stay moist and comfortable.

Some people are not able to produce enough tears or the appropriate quality of tears to keep their eyes healthy or comfortable. This condition is known as dry eye.

Symptoms of dry eye include scratchiness, stinging, stringy mucus in or around the eyes, and blurry vision.

Sometimes people with dry eye will experience excess tearing. This is the eye’s response to the discomfort from dry eye.

When the eyes get irritated, the gland that makes tears releases a larger than usual volume of tears, which overwhelm the tear drainage system. These excess tears then overflow from your eyes.

Dry eye often increases with age as tear production slows. For women, this is especially true after menopause.
Dry eye can be associated with other problems like Sjögren’s syndrome, which can cause dry eyes along with dry mouth and arthritis.

Your eye surgeon (ophthalmologist) can usually diagnose dry eye by examining your eyes. Sometimes tests that measure tear production are necessary.

The Schirmer tear test measures tear production by placing filter-paper strips between your eyeball and your lower lid.

Your ophthalmologist might also test you for dry eye using diagnostic drops to check for patterns of dryness on the eye’s surface.

Treatments for dry eye include eyedrops called artificial tears to lubricate the eyes and help maintain moisture.

Your ophthalmologist may conserve your tears by closing the channels through which your tears drain.

You can also try to prevent tears from evaporating by avoiding wind and dry air from overheated rooms and hair dryers. Smoking irritates dry eyes and should be avoided.

In less developed countries, dry eye due to a lack of vitamin A in the diet is not uncommon. Ointments with vitamin A can help dry eye caused by unusual conditions like Stevens-Johnson syndrome or pemphigoid.

**Conjunctivitis**

“Pink eye”, the common name for conjunctivitis, is an inflammation or infection of the conjunctiva.

The conjunctiva is the outer, normally clear covering of the sclera (the white part of the eye). The eye appears pink when you have conjunctivitis because the blood vessels of the conjunctiva are dilated.

Pink eye is often accompanied by a discharge, but vision is usually normal and discomfort is mild.

Either a bacterial or a viral infection may cause conjunctivitis. Viral conjunctivitis is much more common. It may last several weeks and is frequently accompanied by a respiratory infection (or cold).

Antibiotic drops or ointments usually do not help, but symptomatic treatment such as cool compresses or over-the-counter decongestant eyedrops can be used while the infection runs its course.

Unlike viral conjunctivitis, bacterial conjunctivitis can be treated with a variety of antibiotic eyedrops or ointments, which usually cure the infection in a day or two.

Conjunctivitis can be very contagious. People who have it should not share towels or pillowcases and should wash their hands frequently. They may need to stay home from school or work, and they should stay out of swimming pools.

Not all cases of conjunctivitis are caused by an infection. Allergies can cause conjunctivitis, too.
Typically, people with allergic conjunctivitis have itchy eyes, especially in spring and fall. Eyedrops to control itching are used to treat allergic conjunctivitis.

It is important not to use medications that contain steroids (names of steroids usually end in “-one” or “-dex”) unless prescribed by an ophthalmologist.

Finally, not all cases of pink eye are caused by conjunctivitis. Sometimes more serious conditions, such as infections, damage to the cornea, very severe glaucoma, or inflammation inside the eye will cause the conjunctiva to become inflamed and pink.

Vision is usually normal when pink eye is caused by conjunctivitis. If your vision is affected or you experience eye pain, it is recommended that you see an ophthalmologist.

Information about eye conditions, disorders and treatments is presented courtesy of the Eye Physicians & Surgeons of Ontario.