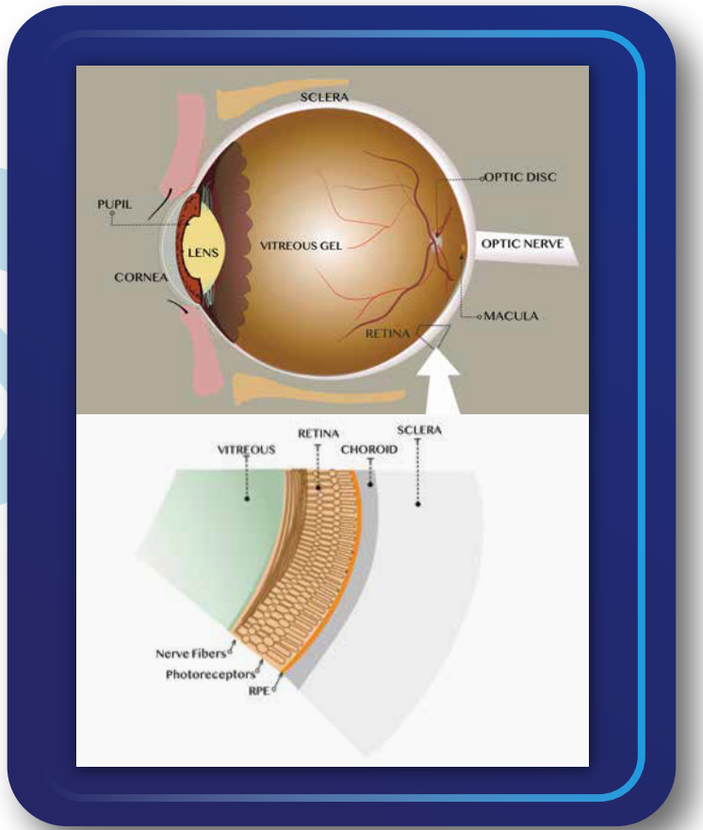
SIMPLY **SPEAKING**

RETINAL DETACHMENT

ANATOMICAL DETAILS

The eyeball is essentially a hollow sphere filled with a liquid gel called the vitreous. The outer most layer of the eyeball is the tough white coat, the sclera. The retina is the innermost coating or layer; it is a thin flimsy membrane made up of millions of light-sensitive cells ("photoreceptors"), their interconnections, and minute blood vessels. Between the retina and the sclera is another thin, spongy layer termed the choroid, made up mostly of fine and very fine blood vessels. These three layers, from inside out, are the retina, the choroid, and the sclera which are normally adherent to each other, sandwiched together. Microscopically, the retina is made up of different layers of cells. The retinal layer immediately adjacent to the choroid, to which it is strongly attached is the Retinal Pigment Epithelium (RPE) . The next layer adjacent to the RPE is the layer of photoreceptor cells, which are tightly lined up side-by-side. These cells are connected at one end to other cells that eventually connect them to the long nerve cells (ganglion cells) that that congregate at the optic nerve.

At the opposite end of the photoreceptor cells are projections, look like rods and cones that extend toward the RPE. The photoreceptors and the RPE layers are not adherent or attached to each other. The vitreous gel is largely transparent and contains mostly water. It has intertwined fibers that in some areas attach to the retina and the lens of the eye. The vitreous provides support to the retina by pushing it against the choroid, but it is this same relationship with the retina that can lead to a retinal detachment.

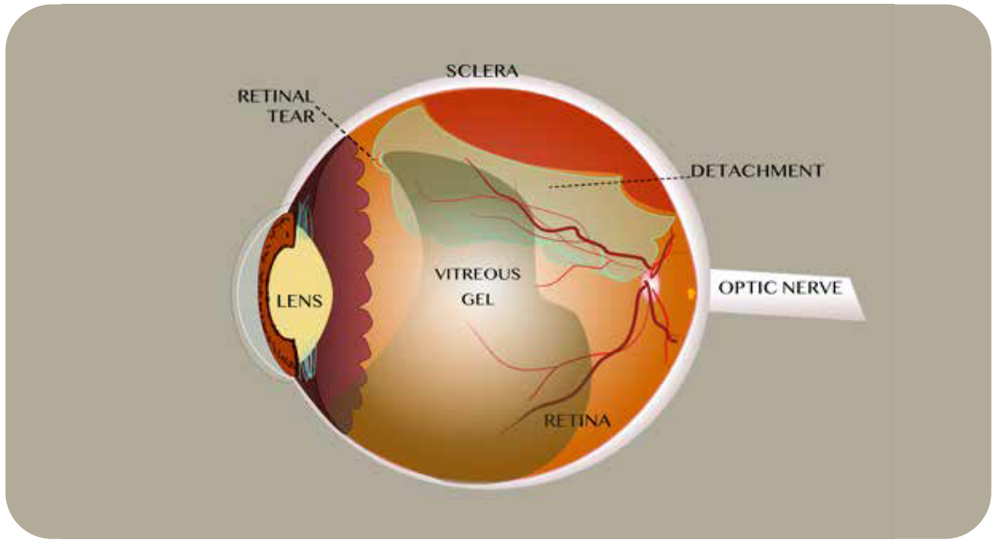


RETINAL DETACHMENT

A tear or hole in the retina can occur from trauma to the eye and from aging, particularly in near-sighted individuals (myopia of > 4.00 is a definite risk factor). If the tear or hole allows liquid from the vitreous gel to gain entry into the retinal layers, the fluid will cause a space to develop between the photoreceptor layer and the RPE that eventually causes the internal layers of the retina to "float" like a loose blanket in the vitreous. Loss of the intimate contact of the retinal layers with the RPE disrupts the ability of the retina to perceive light in the part that is detached, resulting in a black curtain in the field of vision of the eye with a retinal detachment. The curtain progresses upward or downward as the detachment involves more and more of the retina, causing an almost total loss of sight. Usually, the hole or tear starts in the sides or the periphery of the retina where the vitreous is attached.

The vitreous might precipitate the tear by pulling on the retina due to the adhesions of the vitreous fibers to the retinal periphery. Blunt force trauma to the eye ball or the head can cause sudden violent movement of vitreous pulling thinned parts of the retina apart, creating the hole or tear. The detachment itself is painless but it may be preceded by numerous new floaters (like a shower of ants) and flashes of light usually at the corner of the eye (see Vitreous flyer). Once a detachment begins, it is progressive to the point that the entire retina is involved including the center of the retina, the macula, within a matter of a hours or a few days. If the central vision is still unaffected (the macula is still attached), the repair of a retinal detachment has the best chance of succeeding in fully restoring vision; hence, the surgery must be performed immediately. Once the macula is detached, surgical repair is recommended as soon as possible but it is no longer an emergency.

RETINAL DETACHMENT



SURGICAL TREATMENT

A retinal detachment does not improve spontaneously or with medications. Surgery involves removing part of the vitreous gel that is adherent to the retina near the hole or tear, closing off the hole with laser treatment, and removing the fluid behind the retina (see flyer on Pars Plana Vitrectomy). A silicone band may be placed within the sclera in some techniques. For those that require it, a special gas or silicone oil is injected to fill the vitreous cavity in order to push the retinal tear flat and to support the retina while it heals. Patients with a gas bubble in the eye are restricted from climbing very high altitudes and riding on a plane while the bubble has not been absorbed, which usually takes 4-6 weeks. Prolonged detachment causes deterioration of the retinal cells, scarring and membrane formation that can harden the retina into a cone-shaped detachment that is almost impossible to repair. Permanent blindness and other complications can ensue with a neglected detachment.

RISK AND PREVENTION

Certain factors put patients at risk of a detachment:

- The presence of a hole or tear in the retina
- Trauma to the eye or head
- Some types of eye surgery
- Myopia with a grade exceeding -4.00 sph; even after LASIK correction
- A long eyeball, > 26mm in length
- A history of a previous retinal detachment
- Complicated cataract surgery

The more risk factors present, the greater the risk. Depending on the findings, the doctor will suggest the frequency of repeat examinations if needed. A hole or tear in the retina without a retinal detachment yet (usually detected incidentally during examination) would usually require immediate laser treatment (focal photocoagulation) to seal the retinal break. For large tears, cryotherapy may be necessary. Sports that increase the risk of trauma to the eyes or head such as martial arts or boxing should be avoided for patients with high myopia.

PROCEDURE FOR RETINA EVALUATION

1. Pupils are fully dilated with eye drops instilled several times for 10-15minutes.
2. Anesthetic drops are instilled just prior to the examination to reduce sensitivity to the light.
3. A special instrument and lens are used to examine the entire retina.
4. The examination may take anywhere from 5-20 minutes.
5. Ancillary tests might be ordered if there are suspicious findings.

PRECAUTIONS

- Dilating the pupils will blur vision especially near vision, and can last for 1-3 hours.
- Driving may be difficult because of extreme sensitivity to light and glare.
- Patients undergoing the examination are advised to be accompanied by a mature adult.

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