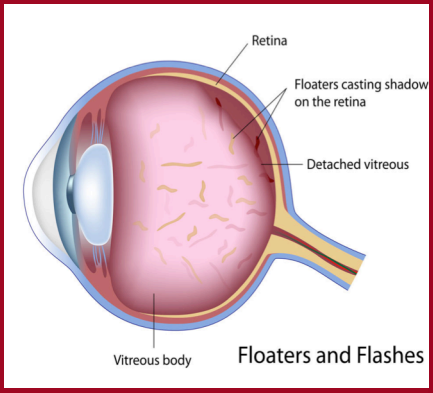
JULY 2015 VOLUME #2 ISSUE 24

# EM CASE OF THE WEEK

BROWARD HEALTH MEDICAL CENTER DEPARTMENT OF EMERGENCY MEDICINE




**Retinal detachment can have very poor results if left undiagnosed and untreated for too long. In some rapidly progressive forms, surgical intervention is most effective if taken within 24 hours. It is our responsibility as ED personnel to rapidly identify and diagnose this condition in order to avoid long-term complications of delayed treatment.**

## EM CASE OF THE WEEK

EM Case of the Month is a monthly "pop quiz" for ED staff. The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.

## Retinal Detachment

*A 72 year old male signs into the ED complaining of a week of new onset floaters in his visual field, recent episodes of sudden flashes of light lasting only a few seconds, and a partial loss of vision as if "a curtain has been dropped across his visual field." He is is seen by the ED physician who conducts a slit-lamp examination. The exam shows vitreous hemorrhage, a small retinal tear, and signs of retinal detachment. A call is put out to the ophthalmologist. Which of the following is the most likely etiology of this patient's retinal detachment?*

A. Neovascularization and fibrosis between the retina and the vitreous causing contraction of the vitreous and associated traction on the retina.

B. Posterior Vitreous Detachment (PVD) or the sudden separation of the vitreous gel from the retina.

C. An inflammatory condition such as a neoplasm of the choroid.

D. Lattice degeneration, or focal retinal thinning in the periphery of the retina associated with vitreous liquefaction, sclerotic lattice-like vessels, and abnormally strong areas of attachment between the vitreous and the retina.

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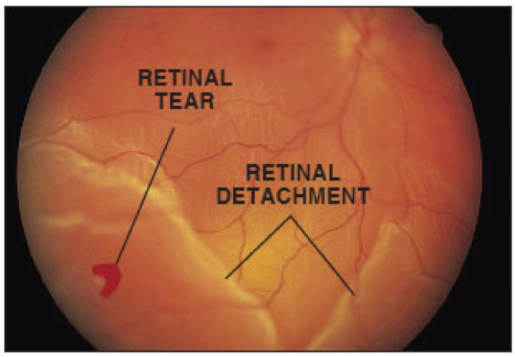


## Take Home Points

- Nontraumatic RRD begin with the normal and acute development of PVD. If the patient also has areas of abnormally strong vitreoretinal adhesion, a full-thickness retinal tear or hole can develop. Liquid vitreous within the eye can percolate through the retinal break creating retinal detachment.
- Without treatment, most symptomatic retinal detachments progress to involve the entire retina and lead to loss of vision. Thus, treatment is indicated for nearly all patients with symptomatic detachments.
- Patients who present with an exudative retinal detachment must have the etiology of this detachment identified and treated

# Retinal Detachment

**The correct answer is B.** Posterior vitreous detachment (PVD) is the most common cause of retinal tears, which often lead to rhegmatogenous retinal detachment. The vitreous is a clear gel-like structure in the back of the eye composed of collagen fibrils and hyaluronic acid that slowly liquefies throughout life. These pockets of liquid can break through the posterior vitreous face and cause PVD from the retina. This event, which occurs typically in patients between the ages of 50 and 75 years, results in a new onset of cobweb-like floaters and/or increased floaters.

**Introduction**

The retina is composed of multiple layers of neurons in the back of the eye. These neurons are designed to convert light into neural impulses that travel to the visual cortex of the brain. These retinal cells are some of the most metabolically active in the body and therefore have a very rich blood supply provided by the choroidal circulation. Retinal detachment occurs when retina separates from the underlying retinal pigment epithelium and choroid and results in ischemia and rapid and progressive photoreceptor degeneration. The amount of photoreceptor degeneration and loss of vision can be minimized by rapid diagnosis and treatment. Without treatment, most symptomatic retinal detachments progress to involve the entire retina and lead to loss of vision. Understanding of the underlying pathophysiology and of which patients are at increased risk can aid in early diagnosis and treatment.

**Pathophysiology**

Retinal detachments can be divided into two categories, rhegmatogenous (caused by a tear in the retina; from the Greek rhegma for tear) or nonrhegmatogenous (caused by leakage or exudation from beneath the retina or vitreous traction pulling on the retina).

**Rhegmatogenous Retinal Detachment**

Rhegmatogenous retinal detachments (RRD) are the most common type of retinal detachment and are caused by a full-thickness retinal hole or retinal tear. The most common etiology of RRD is vitreous traction on the retina caused by posterior vitreous detachment.

**Posterior vitreous detachment**

As discussed above, posterior vitreous detachment (PVD) is the most common cause of retinal tears, which often lead to RRD. Vitreous detachment takes anywhere from one week to three months to develop. There may be certain areas where the adhesion between the vitreous and retina is abnormally strong. As the vitreous detaches, it will create traction and pull on these areas and resulting tears may develop. The sudden flashes of light (photopsia) our patient saw can be attributed to the vitreous pulling on the retinal cells resulting in neural impulses being sent to the brain. In addition, if the patient has developed a full-thickness retinal tear, there may also be a tear in small retinal blood vessels resulting in vitreous hemorrhage, which may be responsible for floaters or blurred vision.

**Nonrhegmatogenous Retinal Detachment**

Other causes of retinal detachment include:

- Exudative retinal detachment most commonly due to neoplasms or inflammatory conditions.
- Traction retinal detachment most commonly due to proliferative diabetic retinopathy. Neovascularization and fibrosis between the retina and the vitreous cause contraction of the vitreous and associated traction on the retina results in retinal detachment.
- Lattice degeneration, or focal retinal thinning in the periphery of the retina associated with vitreous liquefaction, sclerotic lattice-like vessels, and abnormally strong areas of attachment between the vitreous and the retina.
- Penetrating trauma causing a retinal break that can lead to the subsequent subretinal migration of liquid vitreous.

**Diagnosis**

Classic presentation includes a history of new onset floaters, sudden flashes of light (photopsia), and/or partial visual field loss. In addition to history, certain physical exam findings can be helpful. A slit lamp examination should be performed and can exhibit vitreous hemorrhages, retinal tears, and areas of detachment. The use of ultrasound or and exam with Fluorescein dye can be helpful.

**Treatment**

Patients who present with a full-thickness retinal break and a small retinal detachment can be treated with laser photocoagulation or cryoretinopexy. This creates a chorioretinal scar intended to keep the retinal detachment in place and prevent it from spreading.

Pneumatic retinopexy includes cryoretinopexy of the retinal break followed by injection of an intravitreal gas bubble. Patient head positioning postoperatively is important to maintain the position of the gas bubble and allow it to tamponade the retinal break. The retinal epithelial cells then reabsorb the subretinal fluid, thereby reattaching the retina.

Scleral buckle is performed after a retrobulbar nerve block. Cryoretinopexy to the retinal breaks is performed, followed by suturing of an exoplant to the outside of the sclera producing an indent in the wall of the eye. Subretinal fluid is drained if necessary.

Patients with more complicated retinal detachments may require an additional vitrectomy during which multiple cuts are made in the sclera and the vitreous is removed. The patient's retina is then flattened using air, gas, or silicone oil.

Patients who present with an exudative retinal detachment must have the etiology of this detachment identified and treated. Surgical repair of this type of retinal detachment is not recommended in most cases.

Resources:
1. Jorge G Arroyo, MD, MPH Retinal Detachment. UpToDate. 2013
2. Medscape- Retinal Detachment. http://emedicine.medscape.com/article/798501-overview
3. Richard W. Allinson, MD *Retinal Detachment*. The 5-Minute Clinical Consult. 2014

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This month's case was written by Priya Panara. Priya is a 4th year medical student from NSU-COM. She did her emergency medicine rotation at BHMC in April 2015. Priya plans on pursuing a career in Internal Medicine after graduation.